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8th Standard Mathematics

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MATHEMATICS

1. NUMBERS

IMPORTANT POINTS

- A number that can be expressed in the form $\frac{a}{b}$ where a and b are integers and b≠0 is called a rational number.
- All natural numbers, whole numbers, integers and fractions are rational numbers.
- Every rational number can be represented on a number line.
- 0 is neither a positive nor a negative rational number.
- A rational number $\frac{a}{b}$ is said to be in the standard form if its denominator b is a positive integer and HCF (a,b)=1
- There are unlimited numbers of rational numbers between two rational numbers.
- Subtracting two rational numbers is the same as adding the additive inverse of the second number to the first rational number.
- Multiplying two rational numbers is the same as multiplying their numerators and denominators separately and then writing the product in the standard form.
- Dividing a rational number by another rational number is the same as multiplying the first rational number by the reciprocal of the second rational number.
- The following table is about the properties of rational numbers($\mathbb{Q}$).

$\mathbb{Q}$	Closure	Commutative	Associative	Multiplication is distributive over +/–
+	✓	✓	✓	✓
–	✓	×	×	✓
×	✓	✓	✓	–
÷	×	×	×	–

- 0 and 1 are respectively the additive and the multiplicative identities of rational numbers.
- The additive inverse for $\frac{a}{b}$ is $\frac{-a}{b}$ and vice – versa.
- The reciprocal or the multiplicative inverse of a rational number $\frac{a}{b}$ is $\frac{b}{a}$ since $\frac{a}{b}\times\frac{b}{a}=1$.
- A natural number n is called a square number, if we can find another natural number m such that $n = m^2$.
- The square root of a number n, written as $\sqrt{n}$ (or) $n^{\frac{1}{2}}$, is the number that gives n when multiplied by itself.
- The number of times a prime factor occurs in the square is equal to twice the number of times it occurs in the prime factorization of the number.
- For any two positive numbers a and b. we have
  (i) $\sqrt{ab} = \sqrt{a}\times\sqrt{b}$ and (ii) $\sqrt{\frac{a}{b}}=\frac{\sqrt{a}}{\sqrt{b}}$ (b ≠ 0)
- If you multiply a number by itself and then by itself again, the result is a cube number.
- The cube root of a number is the value that when cubed gives the original number.
- An expression that represents repeated multiplication of the same factor is called a power.
- The exponent corresponds to the number of times the base is used as a factor.
- Laws of Exponents: (i) $a^m \times a^n = a^{m+n}$
  (ii) $\frac{a^m}{a^n} = a^{m-n}$
  (iii) $(a^m)^n = a^{mn}$
- Other results: (i) $a^\circ = 1$ (ii) $a^{-m} = \frac{1}{a^m}$
  (iii) $a^m \times b^m = (ab)^m$ (iv) $\frac{a^m}{b^m}=\left(\frac{a}{b}\right)^m$

Example Problems

1. Compare the following pairs of rational numbers.

(i) $\frac{-11}{5},\frac{-21}{8}$ **(ii)** $\frac{3}{-4},\frac{-1}{2}$ **(iii)** $\frac{2}{3},\frac{4}{5}$

Sol:

(i) $\frac{-11}{5},\frac{-21}{8}$

LCM of 5, 8 is 40

$$\frac{-11}{5} = \frac{-11\times8}{5\times8} = \frac{-88}{40}$$

$$\frac{-21}{8} = \frac{-21\times5}{8\times5} = \frac{-105}{40}$$

$$\frac{-105}{40} < \frac{-88}{40} \quad \therefore \quad \frac{-21}{8} < \frac{-11}{5}$$

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(ii) $\frac{3}{-4}, \frac{-1}{2}$

LCM of 4 and 2 = 4

$$\frac{3}{-4} = \frac{-3}{4}$$

$$\frac{-1}{2} = \frac{-1\times2}{2\times2} = \frac{-2}{4}$$

$$\frac{3}{-4} < \frac{-2}{4} \Rightarrow -\frac{3}{4} < \frac{-1}{2}$$

(iii) $\frac{2}{3}, \frac{4}{5}$

LCM of 3 and 5 is 15.

$$\frac{2}{3} = \frac{2\times5}{3\times5} = \frac{10}{15}$$

$$\frac{4}{5} = \frac{4\times3}{5\times3} = \frac{12}{15}$$

$$\frac{10}{15} < \frac{12}{15} \quad \therefore \quad \frac{2}{3} < \frac{4}{5}$$

2. Arrange the following rational numbers in ascending and descending order.

(i) $\frac{-5}{12}, \frac{-11}{8}, \frac{-15}{24}, \frac{-7}{-9}, \frac{12}{36}$ **(ii)** $\frac{-17}{10}, \frac{-7}{5}, 0, \frac{-2}{4}, \frac{-19}{20}$

Sol:

(i) $\frac{-5}{12}, \frac{-11}{8}, \frac{-15}{24}, \frac{-7}{-9}, \frac{12}{36}$

LCM of 12, 8, 24, 9, 36 is 4 × 3 × 2 × 3 = 72

$$\frac{-5}{12} = \frac{-5\times6}{12\times6} = \frac{-30}{72}$$

$$\frac{-11}{8} = \frac{-11\times9}{8\times9} = \frac{-99}{72}$$

$$\frac{-15}{24} = \frac{-15\times3}{24\times3} = \frac{-45}{72}$$

$$\frac{-7}{-9} = \frac{7\times8}{9\times8} = \frac{56}{72}$$

$$\frac{12}{36} = \frac{12\times2}{36\times2} = \frac{24}{72}$$

4	12, 8, 24, 9, 36
3	3, 2, 6, –9, 9
2	1, 2, 2, 3, 3
3	1, 1, 1, 3, 3
	1, 1, 1, 1, 1

Now comparing the numerators –30, –99, –45, 56, 24 we get 56 > 24 > –30 > –45 > –99

i.e $\frac{56}{72} > \frac{24}{72} > \frac{-30}{72} > \frac{-45}{72} > \frac{-99}{72}$

and so $\frac{-7}{-9} > \frac{12}{36} > \frac{-5}{12} > \frac{-15}{24} > \frac{-11}{8}$

∴ Descending order $\frac{-7}{-9} > \frac{12}{36} > \frac{-5}{12} > \frac{-15}{24} > \frac{-11}{8}$

Ascending order $\frac{-11}{8} < \frac{-15}{24} < \frac{-5}{12} < \frac{12}{36} < \frac{-7}{-9}$

(ii) $\frac{-17}{10}, \frac{-7}{5}, 0, \frac{-2}{4}, \frac{-19}{20}$

LCM of 10, 5, 4, 20 is 5 × 2 × 2 = 20

$$\frac{-17}{10} = \frac{-17\times2}{10\times2} = \frac{-34}{20}$$

$$\frac{-7}{5} = \frac{-7\times4}{5\times4} = \frac{-28}{20}$$

$$\frac{-2}{4} = \frac{-2\times5}{4\times5} = \frac{-10}{20}$$

$$\frac{-19}{20} = \frac{-19}{20}$$

5	10, 5, 4, 20
3	2, 1, 4, 4
2	1, 1, 2, 2
	1, 1, 1, 1,

Negative numbers are less then zero.

∴ Arranging the numerators we get

–34 < – 28 < –19 < –10 < 0

∴ $\frac{-34}{20} < \frac{-28}{20} < \frac{-19}{20} < \frac{-10}{20} < 0$

Ascending order = $\frac{-17}{10} < \frac{-7}{5} < \frac{-19}{20} < \frac{-2}{4} < 0$

Descending order 0 > $\frac{-2}{4} > \frac{-19}{20} > \frac{-7}{5} > \frac{-17}{10}$

3. Find the sum :

(i) $\frac{7}{5}+\frac{3}{5}$ **(ii)** $\frac{7}{5}+\frac{5}{7}$ **(iii)** $\frac{6}{5}+\left(\frac{-14}{15}\right)$

(iv) $-4\frac{2}{3}+7\frac{5}{12}$

Sol:

(i) $\frac{7}{5}+\frac{3}{5} = \frac{7+3}{5} = \frac{10}{5} = 2$

(ii) $\frac{7}{5}+\frac{5}{7} = \frac{7\times7+5\times5}{35} = \frac{49+25}{35} = \frac{74}{35}$

(iii) $\frac{6}{5}+\left(\frac{-14}{15}\right) = \frac{6\times3+(-14)}{15} = \frac{18+(-14)}{5} = \frac{4}{5}$

(iv) $-4\frac{2}{3}+7\frac{5}{12} = \frac{14}{3}+\frac{18}{12} = \frac{-14\times4+89}{12}$

$$= \frac{-56+89}{12} = \frac{\overset{11}{\cancel{33}}}{\underset{4}{\cancel{12}}} = \frac{-11}{4}$$

4. Subtract : $\frac{-8}{44}$ from $\frac{-17}{11}$.

Sol:

$$\frac{-17}{11}-\left(\frac{-8}{44}\right) = \frac{-17}{11}+\frac{8}{44} = \frac{-17\times4+8}{44}$$

$$= \frac{-68+8}{44} = \frac{\overset{15}{\cancel{60}}}{\underset{11}{\cancel{44}}} = \frac{-15}{11}$$

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5. Evaluate : (i) $\frac{9}{132}\times\frac{-11}{3}$ (ii) $\frac{-7}{27}\times\frac{24}{-35}$

Sol:

(i) $\frac{\cancel{9}^{3}}{\cancel{132}_{12}_{4}}\times\frac{-\cancel{11}}{\cancel{3}} = \frac{-1}{4}$ (ii) $\frac{-\cancel{7}}{\cancel{27}_{9}}\times\frac{\cancel{24}^{8}}{-\cancel{35}_{5}} = \frac{8}{45}$

6. Divide :

(i) $\frac{-21}{5}$ by $\frac{-7}{-10}$ (ii) $\frac{-3}{13}$ by -3 (iii) -2 by $\frac{-6}{15}$

Sol:

(i) $\frac{-21}{5}\div\frac{-7}{-10} = \frac{\cancel{-21}^{3}}{\cancel{5}}\times\frac{\cancel{10}^{2}}{\cancel{7}} = -6$

(ii) $\frac{-3}{13}\div -3 = \frac{-3}{13}\times\frac{-1}{3} = \frac{-3\times-1}{13\times3} = \frac{3}{39}$

(iii) $-2\div\frac{-6}{15} = -2\times\frac{15}{-6} = \frac{-2\times15}{-6} = \frac{-\cancel{30}^{5}}{-\cancel{6}} = 5$

7. Find (a + b) ÷ (a – b) if (i) $a=\frac{1}{2}, b=\frac{2}{3}$ (ii) $a=\frac{-3}{5}, b=\frac{2}{15}$

Sol:

(i) $a+b = \frac{1}{2}+\frac{2}{3} = \frac{1\times3+2\times2}{6} = \frac{3+4}{6} = \frac{7}{6}$

$a-b = \frac{1}{2}-\frac{2}{3} = \frac{1\times3-2\times2}{6} = \frac{3-4}{6} = \frac{-1}{6}$

$(a+b)\div(a-b) = \frac{7}{6}\div\frac{-1}{6} = \frac{7}{\cancel{6}}\times\frac{\cancel{6}}{-1} = -7$

(ii) $a+b = \frac{-3}{5}+\frac{2}{15} = \frac{-3\times3+2}{15} = \frac{-9+2}{15} = \frac{-7}{15}$

$a-b = \frac{-3}{5}-\frac{2}{15} = \frac{-3\times3-2}{15} = \frac{-9-2}{15} = \frac{-11}{15}$

$(a+b)\div(a-b) = \frac{-7}{15}\div\frac{-11}{15} = \frac{-7}{\cancel{15}}\times\frac{\cancel{15}}{-11} = \frac{7}{11}$

8. Simplify :

(i) $\left[\frac{11}{8}\times\left(\frac{-6}{33}\right)\right]+\left[\frac{1}{3}+\left(\frac{3}{5}\div\frac{9}{20}\right)\right]-\left[\frac{4}{7}\times\frac{-7}{5}\right]$

(ii) $\left[\frac{4}{3}\div\left(\frac{8}{-7}\right)\right]-\left[\frac{3}{4}\times\frac{4}{3}\right]+\left[\frac{4}{3}\times\left(\frac{-1}{4}\right)\right]$

Sol:

(i) $\left[\frac{11}{8}\times\left(\frac{-6}{33}\right)\right]+\left[\frac{1}{3}+\left(\frac{3}{5}\div\frac{9}{20}\right)\right]-\left[\frac{4}{7}\times\frac{-7}{5}\right]$

$= \frac{\cancel{11}\times(-\cancel{6}^{\,3})}{\cancel{8}_{4}\times\cancel{33}_{3}}+\left[\frac{1}{3}+\left(\frac{\cancel{3}}{\cancel{5}}\times\frac{\cancel{20}^{4}}{\cancel{9}_{3}}\right)\right]-\left[\frac{4\times-\cancel{7}}{\cancel{7}\times5}\right]$

$= -\frac{1}{4}+\left[\frac{1}{3}+\frac{4}{3}\right]-\left(\frac{-4}{5}\right)$

$= -\frac{1}{4}+\frac{5}{3}+\frac{4}{5} = \frac{-15+100+48}{60} = \frac{133}{60}$

(ii) $\left[\frac{4}{3}\div\left(\frac{8}{-7}\right)\right]-\left[\frac{3}{4}\times\frac{4}{3}\right]+\left[\frac{4}{3}\times\left(\frac{-1}{4}\right)\right]$

$= \left[\frac{\cancel{4}}{3}\times\frac{-7}{\cancel{8}_{2}}\right]-\left[\frac{\cancel{3}}{\cancel{4}}\times\frac{\cancel{4}}{\cancel{3}}\right]+\left[\frac{\cancel{4}\times(-1)}{3\times\cancel{4}}\right]$

$= \left(\frac{-7}{6}\right)-1+\left(\frac{-1}{3}\right) = \frac{-7-6+(-2)}{6} = \frac{-\cancel{15}^{5}}{\cancel{6}_{2}} = \frac{-5}{2}$

9. A student had multiplied a number by $\frac{4}{3}$ instead of dividing it by $\frac{4}{3}$ and got 70 more than the correct answer. Find the number.

Sol:

Let the number = a

$a\times\frac{4}{3}-a\div\frac{4}{3} = 70$

$a\times\frac{4}{3}-a\times\frac{3}{4} = 70 \Rightarrow a\left[\frac{4}{3}-\frac{3}{4}\right] = 70$

$a\left[\frac{4\times4-3\times3}{12}\right] = 70$

$a\left[\frac{16-9}{12}\right] = 70 \Rightarrow a\left[\frac{7}{12}\right] = 70$

$a = \cancel{70}^{10}\times\frac{12}{\cancel{7}} = 120$

10. Find the square root by prime factorisation method.

(i) 144 (ii) 256 (iii) 784 (iv) 1156 (v) 4761 (vi) 9025

Sol:

(i) 144

$144 = 2\times2\times2\times2\times3\times3$

$\sqrt{144} = 2\times2\times3 = 12$

2	144
2	72
2	36
2	18
3	9
	3

(ii) 256

$256 = 2\times2\times2\times2\times2\times2\times2\times2$

$\sqrt{256} = 2\times2\times2\times2 = 16$

2	256
2	128
2	64
2	32
2	16
2	8
2	4
	2

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$a^2 = 49 \times 4$

$a^2 = 7 \times 7 \times 2 \times 2$

$a = 14$ cm

Radius of each circle = 7 cm

∴ Area required = Area of ΔABC – 3 × Area of sector of angle 60° and r = 7 cm

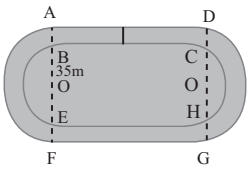
$$= 49\sqrt{3} - 3\left(\frac{60^\circ}{360^\circ} \times \frac{22}{7} \times 7 \times 7\right) \text{ cm}^2$$

$$= 49\sqrt{3} - 77 \text{ cm}^2$$

$$= 49 \times 1.73 - 77 \text{ cm}^2 = 7.77 \text{ cm}^2$$

Required area = 7.77 cm^2 (approximately)

27. An athletic track 14m wide consists of two straight sections 120m long joining semi-circular ends whose inner radius is 35 m. Calculate the area of the shaded region.



Sol:

OB = O'C = 35 m

AB = CD = 14 m

OA = O'D = (35 + 14) m = 49 m

Area of the shaded region = {Area of the rectangle ABCD + Area of the rectangle EFGH + 2[{Area of semi circles with radius 49m} – {Area of semi-circle with radius 35m}]

$$= (14 \times 120) + (14 \times 120) + 2\left[\frac{1}{2} \times \frac{22}{7} \times 49 \times 49\right] - 2\left[\frac{1}{2} \times \frac{22}{7} \times 35 \times 35\right]$$

$$= 1680 + 1680 + \frac{22}{7}(49^2 - 35^2) \text{ m}^2$$

$$= 3360 + \frac{22}{7}(49 + 35)(49 - 35) \text{ m}^2$$

$$= 3360 + \frac{22}{7} \times 84 \times 14 \text{ m}^2$$

$$= 3360 + (44 \times 84) \text{ m}^2 = 7056 \text{ m}^2$$

3. ALGEBRA

IMPORTANT POINTS

- Algebra is the study of mathematical symbols and rules for calculating these symbols.
- In arithmetic only numbers and their arithmetical operations (such as +, –, ×, ÷). occur
- In algebra, numbers are often represented by symbols called variables.
- An algebraic expression may contain fractions, negative powers on their variables. Eg : $zy^2 + \frac{5}{y}$
- An expression which contains only one term is called a **monomial.**
  Eg. $4x$, $3x^2y$, $-2y^2$
- An expression which contains only two terms is called a **binomial.**
  Eg. $2x + 3$, $5y^2 + 9y$, $a^2b^2 + 2b$
- An expression which contains only three terms is called a **trinomial.**
  Eg. $2a^2b - 8ab + b^2$, $m^2 - n^2 + 3$
- A polynomial contains only whole numbers as the powers of their variables
  Eg. $3x^2 - 5$

(A) MULTIPLICATION OF AGEBRAIC EXPRESSIONS

- To multiply or to find out the product of algebraic expressions follow the steps.
  (i) Multiply the signs of the terms.
  - Product of two like signs are positive
  - Product of two unlike signs is negative

  (ii) Multiply the corresponding co-efficients of the terms.

  (iii) Multiply the variable factors using laws of exponents.
  - $x^m \times x^n = x^{m+n}$
- Product of two terms is represented by the symbol ×, ( ), or '.'.
- If 'a' is a constant, x and y are variables then $a(x + y) = ax + ay$ states the **distributive law**.
- $2x^2 - 5xy + 6y^2 + 7x - 10y + 9$

  Numerical co efficient in $2x^2$ is 2

  Numerical co efficient in $-5xy$ is –5

  Numerical co efficient in $6y^2$ is 6

  Numerical co efficient in $7x$ is 7

  Numerical co efficient in $-10y$ is – 10

  Numerical co-efficient in 9 is 9
- $\frac{x}{3} + \frac{2y}{5} - xy + 7$

  Numerical co efficient in $\frac{x}{3}$ is $\frac{1}{3}$

  Numerical co efficient in $\frac{2y}{5}$ is $\frac{2}{5}$

  Numerical co efficient in $-xy$ is –1

  Numerical co efficient in 7 is 7

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Example Problems

1. Add : $2x$, $6y$, $9x - 2y$

Sol:

$2x + 6y + 9x - 2y = 2x + 9x + 6y - 2y$

$= (2 + 9)x + (6 - 2)y = 11x + 4y$

2. Simplify :

$(5x^3y^3 - 3x^2y^2 + xy + 7) + (2xy + x^3y^3 - 5 + 2x^2y^2)$

Sol:

$(5x^3y^3 - 3x^2y^2 + xy + 7) + (2xy + x^3y^3 - 5 + 2x^2y^2)$

$= 5x^3y^3 + x^3y^3 - 3x^2y^2 + 2x^2y^2 + xy + 2xy + 7 - 5$

$= (5 + 1)\, x^3y^3 + (-3 + 2)\, x^2y^2 + (1 + 2)\, xy + 2$

$= 6x^3y^3 - x^2y^2 + 3xy + 2$

3. The sides of a triangle are $2x - 5y + 9$, $3y + 6x - 7$ and $-4x + y + 10$. Find the perimeter of the triangle.

Sol:

Perimeter of the triangle = Sum of three sides

$= (2x - 5y + 9) + (3y + 6x - 7) + (-4x + y + 10)$

$= 2x - 5y + 9 + 3y + 6x - 7 - 4x + y + 10$

$= 2x + 6x - 4x - 5y + 3y + y + 9 - 7 + 10$

$= (2 + 6 - 4)\, x + (-5 + 3 + 1)\, y + (9 - 7 + 10)$

$= 4x - y + 12$

$\therefore$ Perimeter of the triangle $= 4x - y + 12$ units.

4. Subtract $-2mn$ from $6mn$.

Sol:

$6mn - (-2mn) = 6mn + (+2mn)$

$= (6 + 2)\, mn = 8mn$

5. Subtract $6a^2 - 5ab + 3b^2$ from $4a^2 - 3ab + b^2$.

Sol:

$(4a^2 - 3ab + b^2) - (6a^2 - 5ab + 3b^2)$

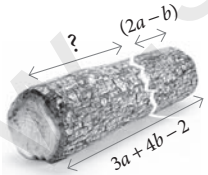
$= (4a^2 - 6a^2) + (-3ab - (-5ab)] + (b^2 - 3b^2)$

$= (4 - 6)\, a^2 + [-3ab + (+5ab)] + (1 - 3)\, b^2$

$= [4 + (-6)]\, a^2 + (-3 + 5)\, ab + [1 + (-3)]b^2$

$= -2a^2 + 2ab - 2b^2$

6. The length of a log is $3a + 4b - 2$ and a piece $(2a - b)$ is removed from it. What is the length of the remaining log?



Sol:

Length of the log $= 3a + 4b - 2$

Length of the piece removed $= 2a - b$

Remaining length of the log $= (3a + 4b - 2) - (2a - b)$

$= (3a - 2a) + [4b - (-b)] - 2$

$= (3 - 2)\, a + (4 + 1)\, b - 2$

$= a + 5b - 2$

7. A tin had 'x' litres oil. Another tin had $(3x^2 + 6x - 5)$ litres of oil. The shopkeeper added $(x + 7)$ litres more to the second tin. Later he sold $(x^2 + 6)$ litres of oil from the second tin How much oil was left in the second tin?

Sol:

Quantity of oil in the second tin $= 3x^2 + 6x - 5$ litres.

Quantity of oil added $= x + 7$ litres

$\therefore$ Total quantity of oil in the second tin

$= (3x^2 + 6x - 5) + (x + 7)$ litres

$= 3x^2 + (6x + x) + (-5 + 7)$

$= 3x^2 + (6 + 1)x + 2$

$= 3x^2 + 7x + 2$ litres

Quantity of oil sold $= x^2 + 6$ litres

$\therefore$ Quantity of oil left in the second tin

$= (3x^2 + 7x + 2) - (x^2 + 6)$

$= (3x^2 - x^2) + 7x + (2 - 6)$

$= (3 - 1)\, x^2 + 7x + (-4)$

$= 2x^2 + 7x - 4$

Quantity of oil left $= 2x^2 + 7x - 4$ litres

8. Find the product of the terms.

(i) $-2mn, (2m)^2, -3mn$ (ii) $3x^2y, -3xy^3, x^2y^2$

Sol:

(i) $(-2mn) \times (2m)^2 \times (-3mn)$

$= (-2mn) \times 2^2\, m^2 \times (-3mn)$

$= (-2mn) \times 4m^2 \times (-3mn)$

$= (-)\,(+)(-)\,(2 \times 4 \times 3)\,(m \times m^2 \times m)\,(n \times n)$

$= 24\, m^4\, n^2$

(ii) $(3x^2y) \times (-3xy^3) \times (x^2y^2)$

$= (+) \times (-) \times (+) \times (3 \times 3 \times 1)\,(x^2 \times x \times x^2) \times (y \times y^3 \times y^2)$

$= -9x^5\, y^6$

9. If $l = 4pq^2$, $b = -3p^2q$, $h = 2p^3q^3$ then, find the value of $l \times b \times h$.

Sol:

Given $l = 4pq^2$

$b = -3p^2q$

$h = 2p^3\, q^3$

$l \times b \times h = (4pq^2) \times (-3p^2\, q) \times (2p^3q^3)$

$= (+)\,(-)(+)\,(4 \times 3 \times 2)\,(p \times p^2 \times p^3)\,(q^2 \times q \times q^3)$

$= -24p^6q^6$

10. Expand

(i) $5x\,(2y - 3)$ (ii) $-2p\,(5p^2 - 3p + 7)$

Sol:

(i) $5x\,(2y - 3) = (5x)\,(2y) - (5x)\,(3)$

$= (5 \times 2)\,(x \times y) - (5 \times 3)x$

$= 10xy - 15x$

(ii) $-2p\,(5p^2 - 3p + 7)$

$= (-2p)\,(5p^2) + (-2p)\,(-3p) + (-2p)\,(7)$

$= [(-)\,(+)\,(2 \times 5)\,(p \times p^2)] + [(-)\,(-)\,(2 \times 3)\,(p \times p)] + (-)\,(+)\,(2 \times 7)\,p$

$= -10p^3 + 6p^2 - 14p$

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Now A's 1 day's work = (A + B + C)'s 1 day work – (B + C)'s 1 day work

$$= \frac{1}{10} - \frac{1}{15} = \frac{3}{30} - \frac{2}{30} = \frac{1}{30}$$

∴ A takes 30 days to complete the work.

B's 1 day work = (A + B + C)'s 1 day's work – (A + C)'s 1 day's work

$$= \frac{1}{10} - \frac{1}{20} = \frac{6}{60} - \frac{3}{60}$$

$$= \frac{6-3}{60} = \frac{3}{60} = \frac{1}{20}$$

5	12,15,20
4	12,3,4
3	3,3,1
	1,1,1

LCM = 5 × 4 × 3 = 60

B takes 20 days to complete the work.

C's 1 day work = (A + B + C)'s 1 day work – (A + B)'s 1 day work

$$= \frac{1}{10} - \frac{1}{12} = \frac{6}{60} - \frac{5}{60} = \frac{6-5}{60} = \frac{1}{60}$$

∴ C takes 60 days to complete the work.

52. Carpenter A takes 15 minutes to fit the parts of a chair while Carpenter B takes 3 minutes more than A to do the same work. Working together, how long will it take for them to fit the parts for 22 chairs?

Sol:

Time taken by A to fit a chair = 15 minutes

Time taken by B = 3 minutes more than A = 15 + 3 = 18 minutes

$$\therefore \text{A's 1 minute work} = \frac{1}{15}$$

$$\text{B's 1 minute work} = \frac{1}{18}$$

3	15,18
	5, 6

LCM = 3 × 5 × 6 = 180

$$\text{(A + B)'s 1 minutes work} = \frac{1}{15} + \frac{1}{18}$$

$$\frac{12}{180} + \frac{10}{180} = \frac{22}{180} = \frac{11}{90}$$

∴ Time taken by (A + B) to fit a chair

$$= \frac{1}{\frac{11}{90}} = \frac{90}{11} \text{ minutes}$$

∴ Time taken by (A + B) to fit 22 chairs

$$= \frac{90}{11} \times 22 = 180 \text{ minutes}$$

53. A can do a work in 45 days. He works at it for 15 days and then, B alone finishes the remaining work in 24 days. Find the time taken to complete 80% of the work, if they work together.

Sol:

A completes the work in 45 days.

$$\therefore \text{A's 1 day work} = \frac{1}{45}$$

$$\text{A's 15 days work} = \frac{\cancel{15}}{\cancel{45}} = \frac{1}{3}$$

$$\text{Remaining work} = 1 - \frac{1}{3} = \frac{3-1}{3} = \frac{2}{3}$$

B finishes $\frac{2}{3}$ rd work in 24 days

$$\text{B's 1 day work} = \frac{\frac{2}{3}}{24}$$

$$= \frac{\cancel{2}}{3 \times \cancel{24}_{12}} = \frac{1}{36}$$

$$\text{(A+B)'s 1 day work} = \frac{1}{45} + \frac{1}{36}$$

9	45, 36
	5, 4,

$$= \frac{4+5}{180}$$

$$= \frac{\cancel{9}}{\cancel{180}_{20}} = \frac{1}{20}$$

Let x days required to finishes 80% of the work.

$$\therefore \frac{x}{20} = \frac{80}{100} \Rightarrow x = \frac{\overset{16}{\cancel{80}}}{\underset{5}{\cancel{100}}} = \cancel{20} = 16 \text{ days.}$$

54. A is thrice as fast as B. If B can do a piece of work in 24 days, then find the number of days they will take to complete the work together.

Sol:

If B does the work in 3 days, A will do it in 1 day.

B complete the work in 24 days.

∴ A completes the same work in $\frac{24}{3}$ = 8 days.

∴ (A + B) complete the work in $\left.\begin{matrix}\\\\\end{matrix}\right\}$ $\frac{ab}{a+b}$ days

$$= \frac{24 \times 8}{24 + 8} \text{ days}$$

$$= \frac{24 \times 8}{32} \text{ days} = 6 \text{ days.}$$

$$\begin{array}{r|l} 6 & 1 \\ \cancel{24} \times \cancel{8} & \\ \cancel{32} & \\ \cancel{4} & 1 \end{array}$$

They together complete the work in 6 days.

55. A fruit vendor bought some mangoes of which 10% were rotten. He sold $33\frac{1}{3}$% of the rest. Find the total number of mangoes bought by him initially, if he still has 240 mangoes with him.

Sol:

Let the number of mangoes bought by fruit seller initially be x.

Given that 10% of mangoes were rotten

$$\therefore \text{Number of rotten mangoes} = \frac{10}{100} \times x$$

Number of good mangoes $\left.\begin{matrix}\\\\\end{matrix}\right\}$ = x – no. of rotten mangoes

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$= x - \frac{10}{100}x = \frac{100x-10x}{100} = \frac{90}{100}x$ ....(1)

Number of mangoes sold $= 33\frac{1}{3}\%$ of good mangoes $= \frac{100}{3}\%$

$\therefore$ Mangoes sold $= \frac{100}{3}\times\frac{90}{100}x\times\frac{1}{100} = \frac{30}{100}x$ ....(2)

Number of mangoes remaining = No. of good mangoes – No. of mangoes sold

From (1) and (2)

$\therefore \frac{90}{100}x - \frac{30}{100}x = 240 \Rightarrow \frac{90x-30x}{100} = 240$

$\therefore \frac{60x}{100} = 240$

$\therefore x = \frac{2\cancel{40}\times 100}{\cancel{60}_1} = 400$

$\therefore$ Initially he bought 400 mangoes

56. A student gets 31% marks in an examination but fails by 12 marks. If the pass percentage is 35%, find the maximum marks of the examination.

Sol:

Let the maximum marks in the exam be 'x'

Pass percentage is given as 35%

$\therefore$ Pass mark $= \frac{35}{100}\times x = \frac{35}{100}x$

Student gets 31% marks $= \frac{31}{100}\times x = \frac{31}{100}x$

But student fails by 12 marks $\rightarrow$ meaning his mark is 12 less than pass mark.

$\therefore \frac{31}{100}x = \frac{35}{100}x - 12$

$\therefore \frac{35}{100}x - \frac{31}{100}x = 12$

$\therefore \frac{35x-31x}{100} = 12 \Rightarrow \frac{4x}{100} = 12$

$\therefore x = \frac{12\times 100}{4} = 300$

Maximum mark is 300

57. Sultana bought the following things from a general store. Calculate the total bill amount to be paid by her.

i) Medicines costing ₹ 800 with GST at 5%
ii) Cosmetics costing ₹ 650 with GST at 12%
iii) Cereals costing ₹ 900 with GST at 0%
iv) Sunglass costing ₹ 1750 with GST at18 %
v) Air Conditioner costing ₹ 28500 with GST at 28%

Sol:

Formula for bill amount is cost $\left(1+\frac{\text{GST\%}}{100}\right)$

(i) Medicine : bill amount is

$800\left(1+\frac{5}{100}\right) = 800\times\frac{105}{100} = 840$

(ii) Cosmetics: Bill amount is

$650\left(1+\frac{12}{100}\right) = 650\times\frac{112}{100} = 728$

(iii) Cereals : Bill amount is $900\left(1+\frac{0}{100}\right) = 900$

(iv) Sunglass: bill amount is

$1750\left(1+\frac{18}{100}\right) = 1750\times\frac{118}{100} = 2065$

(v) AC : Bill amount is

$28500\left(1+\frac{28}{100}\right) = 28500\times\frac{128}{100} = 36480$

$\therefore$ Total bill amount = 840+728+900+2065+ 36480

= ₹ 41,013 (total bill amount)

58. P's income is 25% more than that of Q. By what percentage is Q's income less than P's?

Sol:

Let Q's income be 100.

P's income is 25% more than that of Q.

$\therefore$ P's income $= 100 + \frac{25}{100}\times 100 = 125$

Q's income is 25 less than that of P

In percentage terms, Q's income is less than P's with respect to P's income is

$\frac{P-Q}{P}\times 100 = \frac{125-100}{125}\times 100 = \frac{25}{125}\times 100 = 20\%$

59. Vaidegi sold two sarees for ₹ 2200 each. On one she gains 10% and on the other she loses 12%. Find her total gain or loss percentage in the sale of the sarees.

Sol:

Saree 1 :

The selling price is ₹ 2200, let cost price be CP1, gain is 10%

Cost price? Using the formula

$SP = CP_1\left(1+\frac{\text{gain\%}}{10}\right)$ ↻ substituting the values

$2200 = CP_1\left(1+\frac{10}{100}\right)$

$\therefore CP_1 = 220\cancel{0}\times\frac{100}{11\cancel{0}} = 2000$

Saree 2 :

The selling price is 2200, let cost price be CP_2, loss is given as 12%. We need to find CP_2 using the formula as before,

$SP = CP_2\left(1-\frac{\text{loss\%}}{100}\right)$ ↻ substituting the values

$2200 = CP_2\left(1-\frac{12}{100}\right) = CP_2\times\left(\frac{100-12}{100}\right)$

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20. Match the following (a = 00..... Z= 25).

(i) mathematics - (a) 18 20 01 19 17 00 02 19 08 14 13
(ii) addition - (b) 03 08 21 08 18 08 14 13
(iii) subtraction - (c) 12 00 19 07 04 12 0019 08 02 18
(iv) multiplication - (d) 00 03 03 08 19 08 14 13
(v) division - (e) 12 20 11 19 08 15 11 15 02 00 19 08 14 13

Solution : **Ans : (i - c, ii - d, iii - a, iv - e, v - b)**

Given that the code is

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z
00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25

(i) Mathematics is

m	a	t	h	e	m	a	t	i	c	s
12	00	19	07	04	12	00	19	08	02	18

So matching option is c

(ii) addition is

a	d	d	i	t	i	o	n
00	03	03	08	19	08	14	13

Matching option is d

(iii) Subtraction is

s	u	b	t	r	a	c	t	i	o	n
18	20	01	19	17	00	02	19	08	14	13

Matching option is a

(iv) multiplication is

m	u	l	t	i	p	l	i	c	a	t	i	o	n
12	20	11	19	08	15	11	08	02	00	19	08	14	13

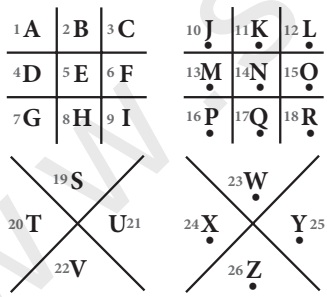
Matching option is e

(v) division is

d	i	v	i	s	i	o	n
03	08	21	08	18	08	14	13

Matching option is b

21. Decode the given Pigpen Cipher text and compare your answer to get the Activity 3 result.



I. The room number in which the treasure took place :

II. Place of the treasure :

III. The name of the treasure :

Sol:

(i) The room in which the treasure took place = 28

(ii) The place of treasure = Chair

(iii) Identity of treasure = Gift voucher.

22. Find the best buy of the following purchases:

(i) A pack of 5 chocolate bars for ₹ 175 or 3 chocolate bars for ₹ 114?

(ii) Basker buy $1\frac{1}{2}$ dozen of eggs for ₹ 81 and Aruna buy 15 eggs for ₹ 64.50?

Sol:

(i)

Item	Cost per packet (₹)	Number of items in a pack	Cost of one item
Chocolate bars	175	5	$\frac{175}{5} = 35$
	114	3	$\frac{114}{3} = 38$

Best buy is a pack of 5 chocolate bars for ₹ 175.

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(ii)

Item	Total cost of Item	Quantity bought	Cost per 1 number (₹)
Egg	₹ 81	$1\frac{1}{2}$ dozen = 12 + 6 = 18	$\frac{81}{18} = 4.5$
	₹ 64.5	15	$\frac{64.5}{15} = 4.3$

Best buy is 15 eggs for ₹ 64.50

23. Fill in the blanks (Use Atbash Cipher that is given in code 3)

(i) G Z N R O = _____
(ii) V M T O R H S = _____
(iii) N Z G S V N Z G R X H = _____
(iv) H X R V M X V = _____
(v) H L X R Z O H X R V M X V = _____

For this question, we need to use Atbash cipher. For Atbash cipher, first we write the alphabets from A to Z and then in reverse from Z to A below that.

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
Z Y X W V U T S R Q P O N M L K J I H G F E D C B A

Sol:

(i) G Z N R O = _____

G Z N R O, from table,
for G, it is T
for Z, It is A
for N, it is M
for R, it is I
for O, it is L
So , the actual word is TAMIL

(ii) V M T O R H S = _____

V M T O R H S
For V, it is E
for M, it is N
for T, it is G
for O, it is L
for R, it is I,
for H, it is S
for S, it is H
Therefore we get E N G L I S H = ENGLISH

(iii) N Z G S V N Z G R X H = _____

Similarly as above for

N Z G S V N Z G R X H
↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
M A T H E M A T I C S = MATHEMATICS

(iv) H X R V M X V = _____

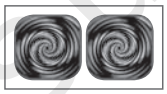
For **H X R V M X V**
↓ ↓ ↓ ↓ ↓ ↓ ↓
S C I E N C E

(v) H L X R Z O H X R V M X V = _____

For **H L X R Z O H X R V M X V**
↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓
S O C I A L S C I E N C E

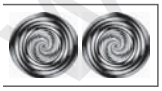
Objective Type Questions

1. 

(A)  **(B)** 

(C)  **Ans : (C)**

2. 

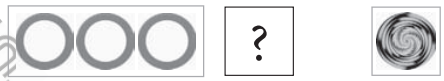
(A)  **(B)** 

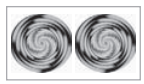
(C)  **Ans : (B)**

3. 

(i)  **(ii)** 

(iii)  **Ans : (B)**

4. 

(i)  **(ii)** 

(iii)  **Ans : (A)**

5. 

(i)  **(ii)** 

(iii)  **Ans : (B)**

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6. In a class there are 26 boys and 15 girls. The teacher wants to select a boy or a girl to represent a quiz competition. In how many ways can the teacher make this selection?
(A) 41 **(B)** 26
(C) 15 **(D)** 390 **Ans : (A)**

7. How many outcomes can you get when you toss three coins once?
(A) 6 **(B)** 8
(C) 3 **(D)** 2 **Ans : (B)**

8. In how many ways can you answer 3 multiple choice questions, with the choices A,B,C and D ?
(A) 4 **(B)** 3
(C) 12 **(D)** 64 **Ans : (D)**

9. How many 2 digit numbers contain the number 7 ?
(A) 10 **(B)** 18
(C) 19 **(D)** 20 **Ans : (B)**

10. What is the eleventh Fibonacci number?
(A) 55 **(B)** 77
(C) 89 **(D)** 144

Solution : **Ans : (C)**

F(n)	1	1	2	3	5	8	13	21	34	55	89	144	233	377	610
Term	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

$\therefore$ 11^{th} Fibonacci number is 89

11. If F(n) is a Fibonacci number and n = 8, which of the following is true?
(A) F(8) = F(9) + F(10) **(B)** F(8) = F(7) + F(6)
(C) F(8) = F(10) × F(9) **(D)** F(8) = F(7) – F(6)

Solution : **Ans : (B)**
Given F(n) is a Fibonacci number & n = 8
$\therefore$ F(8) = F(7) + F(6) as any term in Fibonacci series is the sum of preceding 2 terms

12. Every 3^{rd} number of the Fibonacci sequence is a multiple of _____
(A) 2 **(B)** 3
(C) 5 **(D)** 8

Solution : **Ans : (A)**
Every 3^{rd} number in Fibonacci sequence is a multiple of 2.

13. Every _____ number of the Fibonacci sequence is a multiple of 8
(A) 2^{nd} **(B)** 4^{th}
(C) 6^{th} **(D)** 8^{th} **Ans : (C)**

14. The difference between the 18^{th} and 17^{th} Fibonacci number is
(A) 233 **(B)** 377
(C) 610 **(D)** 987

Solution : **Ans : (D)**
F(18) = F(17) + F (16)
F(18) – F(17) = F(16) = F(15) + F(14)
= 610 + 377 = 987

15. Common prime factors of 30 and 250 are
(A) 2 × 5 **(B)** 3 × 5
(C) 2 × 3 × 5 **(D)** 5 × 5

Solution : **Ans : (A)**
Prime factors of 30 are 2 × 3 × 5
Prime factors of 250 are 5 × 5 × 5 × 2
$\therefore$ Common prime factors are 2 × 5

16. Common prime factors of 36, 60 and 72 are
(A) 2 × 2 **(B)** 2 × 3
(C) 3 × 3 **(D)** 3 × 2 × 2

Solution : **Ans : (D)**
Prime factors of 36 are 2 × 2 × 3 × 3
Prime factors of 60 are 2 × 2 × 3 × 5
Prime factors of 72 are 2 × 2 × 2 × 3 × 3
$\therefore$ Common prime factors are 2 × 2 × 3

17. Two numbers are said to be co-prime numbers if their HCF is
(A) 2 **(B)** 3
(C) 0 **(D)** 1 **Ans : (D)**

18. Praveen recently got the registration number for his new two-wheeler. Here, the number is given in the form of mirror-image. Encode the image and find the correct registration number of praveen's two-wheeler.

T N 1 2 H 2 5 8 9

A) 6 8 9 2 H 2 1 N T **B)** T N I S H S 2 8 6
C) 6 8 2 S H S I N T **D)** 9 8 5 2 H 2 1 N T

Solution : **Ans : (C)**
The mirror image is 6 8 2 S H S I N T
When we place an imaginary mirror & visualize the image seen in the mirror, we will get the below.

6 8 2 S H S I N T | T N 1 2 H 2 5 8 9

Mirror image

19. Online or television advertisements influence people on spending decisions by
(A) using special music
(B) using attractive pictures
(C) making them think that they need the item
(D) all the above **Ans : (D)**

20. When I go shopping, I will buy
(A) something that looks attractive
(B) something that I need to purchase
(C) something my friend has
(D) the first thing I see in the store **Ans : (B)**

21. The best shopping choice is to
(A) shop at brand name stores always buy
(B) compare the choices before buying
(C) the same thing my friends bought
(D) buy at a regular shop always **Ans : (B)**

22. A group of letters are given. A numerical code has been given to each letter. These letters have to be unscrambled into a meaningful word. Find out the code for the word so formed from the 4 answers given.

L I N C P E
1 2 3 4 5 6

(A) 2 3 4 1 5 6 **(B)** 5 6 3 4 2 1
(C) 6 1 3 5 2 4 **(D)** 4 2 1 3 5 6

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Solution : **Ans : (B)**

Given code is

L I N C P E

1 2 3 4 5 6

Option (a) is 234156. When we substitute number for each letter from code, we get,

2 3 4 1 5 6

↓ ↓ ↓ ↓ ↓ ↓

I N C L P E

Option (b) is 563421, similarly, we get

5 6 3 4 2 1

↓ ↓ ↓ ↓ ↓ ↓

P E N C I L = PENCIL

Option (c) is 6 1 3 5 2 4

↓ ↓ ↓ ↓ ↓ ↓

E L N P I C

Option (d) is 4 2 1 3 5 6

↓ ↓ ↓ ↓ ↓ ↓

C I L N P E

So, only in option b, we get a meaningful word, i.e PENCIL.

23. In a certain code, 'M E D I C I N E' is coded as 'E O J D J E F M', then how is 'C O M P U T E R' written in the same code ?

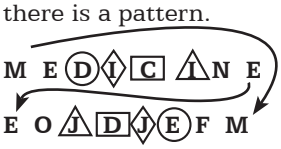
(A) C N P R V U F Q **(B)** C M N Q T U D R

(C) R F U V Q N P C **(D)** R N V F T U D Q

Solution : **Ans : (C)**

It is given that in a certain code M E D I C I N E is coded as E O J D J E F M

When we observe the word & the code, we find that, there is a pattern.



[to understand, see the matching shapes]

To get the code from the word, we follow the below steps

1.  , swap 1st & last letters, so we get

   E [E D I C I N] M

2. For the middle letters, replace the letters with their alphabetically next letters, so we get

   E [E D I C I N] M

   ↓ ↓ ↓ ↓ ↓ ↓

   E [F E J D J O] M

3. Now we have to reverse the order of the middle letters in the bracket, so we get

   E [O J D J E F] M = E O J D J E F M

   Thus we get the code.

So similarly, we have to follow the 3 steps to get code, therefore :

for 

Step 1: Swap 1st & last letters, so we get

R [O M P U T E] C

Step 2: For the middle letters, replace the letters with alphabetically next letters, so we get

R [P N Q V U F] C

Step 3: Reverse the word of letters in the bracket to we get

R [F U V Q N P] C

24. If the word 'P H O N E ' is coded as 'S K R Q H', how will 'R A D I O' be coded ?

(A) S C G N H **(B)** V R G N G

(C) U D G L R **(D)** S D H K Q

Solution : **Ans : (C)**

If PHONE is coded as S K R Q H

Find that code for R A D I O

P H O N E	We find that we get the code, by 3rd letter alphabetically so, from P, skipping Q & R, we get S.
Q I P O F	
R J Q P G	
S K R Q H	

Similarly, from H, skipping I & J, we get K

Like wise for R A D I O, skipping the 2 alphabets,

From R, skip S & T → U

From A, skip B & C → D

From D skip E & F → G

From I skip J & K → L

From O skip P & Q → R

P H O N E
S B E J A
T C F K Q
U D G L R

25. There are four groups of letters in each set. Three of these sets are alike in some way while one is different. Find the one which is different.

(A) C R D T **(B)** A P B Q

(C) E U F V **(D)** G W H X

Solution : **Ans : (A)**

The four groups of letters are

CRDT APBQ EUFV GWHX

The above can be written as

$C_R D_T$ $A_P B_Q$ $E_U F_V$ $G_W H_X$

We find that when we take 1st & 3rd letter & 2nd & 4th letter as 2 pairs, the 3rd letter is the next letter alphabetically to the 1st letter.

Similarly the 4th letter is alphabetically the next letter of the 2nd letter.

i.e CD, AB, EF, GH & PQ, UV, WX

Only in CRDT, we have T instead of 'S'

26. There are four groups of letters in each set. Three of these sets are alike in some way while one is different. Find the one which is different.

(A) H K N Q **(B)** I L O R

(C) M P S **(D)** A D G J

Solution : **Ans : (D)**

The four groups of letters are

HKNQ ILOR JMPS ADGI

If we notice, we find that 2 letters are missing in the sequence. ie.

$H_{IJ}K_{LM}N_{OP}Q$ $I_{JK}L_{MN}O_{PQ}R$

$J_{KL}M_{NO}P_{QR}S$ $A_{BC}D_{EF}G_{H}I$

We find that only in ADGI, the difference is only one letter between G & I.

Hence it is the odd one out.

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7th Standard

GENERAL SCIENCE

PHYSICS

- Measurement
- Force and Motion
- Heat and Temperature
- Electricity
- Light
- Universe and Space

CHEMISTRY

- Matter Around Us
- Atomic Structure
- Changes Around Us
- Polymer Chemistry
- Chemistry in Daily Life

BIOLOGY

- Reproduction & Modification in Plants
- Health and Hygiene
- Cell Biology
- Basis of Classification
- Animals in Daily Life

COMPUTER SCIENCE

- Visual Communication – I
- Digital Painting
- Visual Communication – II

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PHYSICS

MEASUREMENT

Introduction

Measurement is a basic skill which forms an essential part of our day to day activities. Quantities such as mass, weight, distance, temperature, volume are called physical quantities. A value and a unit are used to express the magnitude of a physical quantity.

Fundamental and derived quantities

Generally, physical quantities are classified into two types, namely, (i) Fundamental quantities and (ii) Derived quantities.

Fundamental quantities

- A set of physical quantities which cannot be expressed in terms of any other quantities are known as "Fundamental quantities". Their corresponding units are called "Fundamental units".
- An international system of units, called Si units, was adopted at the 11th General Conference on weights and measures (CGPM) in 1960. There are seven fundamental quantities in SI units (System of International units).

Fundamental quantity	Fundamental unit
Length	Metre (m)
Mass	Kilogram (kg)
Time	Second (s)
Temperature	Kelvin (K)
Electric current	Ampere (A)
Amount of substance	Mole (Mol)
Luminous (light) intensity	Candela (cd)

Derived quantities

The base or fundamental SI units like length, mass, time, etc. are independent of each other. The SI units for all other physical quantities such as area, density, velocity can be derived in terms of the base SI units and are called **derived units**.

Area

The area of a surface is the product of its length and breadth. In order to derive the unit, it is important to find out the relationship between area and the base physical quantities.

$\therefore$ Area = length $\times$ breadth

We know that,

The unit of the area = metre $\times$ metre

= metre^2

= m^2

Thus, the SI unit of area is m^2 and is pronounced as square metre.

One square metre is the area enclosed inside a square of side of 1 metre.

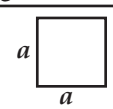
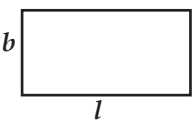
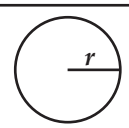
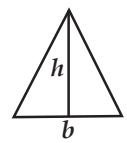
Some of the derived quantities and their units in SI System of units

Derived quantity	Unit
Area = length$\times$breadth	m$\times$m = square metre (or) m^2
Volume = length $\times$ breadth $\times$ height	m$\times$m$\times$m = cubic metre (or) m^3
Speed = distance / time	m/s (or) ms^{-1}
Electric charge = electric current $\times$ time	A$\times$s = As (or) Coulomb (C)
Density = mass / volume	Kg/m^3

Area of regularly shaped figures

The area of regularly shaped figures can be calculated using the corresponding formulae associated with shape of the figures.

Area of some regularly shaped figures

Plane figure	Diagram of figure	Area
Square		side $\times$ side a $\times$ a = a^2
Rectangle		length $\times$ breadth l $\times$ b = lb
Circle		π $\times$ (radius)^2 π $\times$r^2 πr^2
Triangle		(1/2) $\times$ base $\times$ height 1/2 $\times$ b $\times$ h

Area of irregularly shaped figures

- The irregularly shaped figures such as leaves, maps, flowers, bird's feather cannot be compounded by using any ordinary formula. We can find the area of these irregularly shaped figures with the help of a graph sheet.
- The method using graph sheet can also be used to find the area of regularly shaped figures also. In the case of square and rectangle, this method gives the area accurately.

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Volume

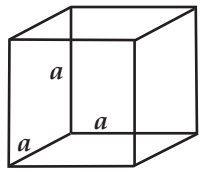
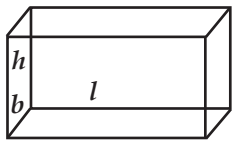
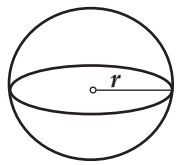
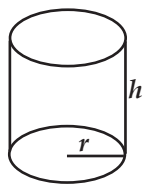
The amount of space occupied by a three dimensional object is known as its volume.

Volume = surface area × height

The SI unit of volume is cubic metre or m^3.

Volume of regularly shaped objects

We can calculate the volume of the regularly shaped objects by using an appropriate formula.

Objects	Figure	Volume
Cube		side × side × side a×a×a a^3
Cuboid		length × breadth × height l×b×h lbh
Sphere		4/3 × π × (radius)^3 4/3 × π ×r^3 4/3 π r^3
Cylinder		π × (radius)^2 × height π×r^2×h πr^2h

Volume of liquids

Liquids does not have a definite shape but occupies space, and hence they also have volume. When a liquid is poured into a container, it takes the shape and volume of the container. The volume of any liquid is equal to the space that it fills and it can be measured using a measuring cylinder or measuring beaker. **The maximum volume of liquid that a container can hold is known as the "capacity of the container".**

The readings are marked in the unit of "ml" i.e, millilitre in the measuring containers. **Litre is the commonly used unit to measure the volume of liquids.** Unit of volume is cubic cm if the dimensions of the object are given in cm. This cubic cm is commonly known as cc. A volume of 1000 cc is termed as one litre (l).

1 litre = 1000 cc or cm^3

1000 ml = 1 litre

To measure the volume of liquids, some other units are also used. Some of them are gallon, ounce, and quart.

1 gallon = 3785 ml

1 ounce = 30 ml

1 quart = 1 litre

Volume of irregularly shaped objects

✦ As in the case of area, the volume of irregularly shaped objects cannot be determined by the existing formulae. For such cases, their volume can be determined using a measuring cylinder and water.

Density

✦ The lightness or heaviness of a body is due to its density. Density of a substance is defined as the mass of the substance contained in unit volume ($1m^3$). If the mass of a substance is 'M' whose volume is 'V', then, the equation for density is given as;

$$\text{Density}(D) = \frac{\text{Mass}(M)}{\text{Volume}(V)}$$

$$D = \frac{M}{V}$$

✦ **Unit of density :** SI unit of density is kg/m^3. The CGS unit of density is g/cm^3.

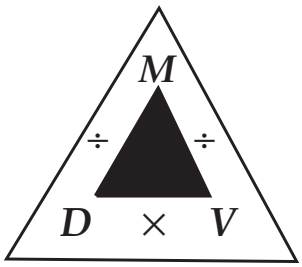
Density of different materials

✦ We know that different materials have different densities. The materials with higher density are called "**denser**" and the materials with lower density are called "**rarer**".

Nature	Materials	Density (kg/m^3)
Gas	Air	1.2
Liquid	Kerosene	800
	Water	1,000
	Mercury	13,600
Solid	Wood	770
	Aluminium	2,700
	Iron	7,800
	Copper	8,900
	Silver	10,500
	Gold	19,300

Relationship between density, mass and volume

The relationship between Mass, density and volume are represented in the following density triangle :



- Density = Mass / Volume
- Mass = Density × Volume
- Volume = Mass / Density

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Measuring distance of celestial bodies

- Usually, the units of centimeter, metre and kilometre are used to express the distances in the land. However, in the context of space, astronomers use different units to measure the distance between the earth and a star or the distance between two stars. The two of such units are namely : 1. Astronomical unit, 2. Light year.

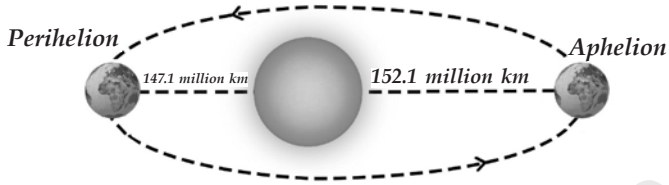
Water has more density than oil. Density of castor oil is 961 kg/m^3. If we put one drop of water in oil, water drop sinks. But, if we put one drop of oil in water, oil floats and forms a layer on water surface. However, some oils are denser than water.

Astronomical unit

- It is known fact that the earth revolves around the sun in an elliptical orbit.
- Hence, the distance between the sun and the earth varies every day. When the earth is in its perihelion position (Perihelion is position of the shortest distance between the earth and the sun), the distance between the earth and the sun is about 147.1 million kilometre. When the earth is in its farthest position, that is when the distance between Earth and Sun is the largest (called aphelion position) the distance is 152.1 million kilometer. The average distance between the earth and the sun is about 149.6 million kilometer. This average distance is taken as one astronomical unit.
- Neptune is 30 AU away from the Sun. It means it is thirty times farther than the Earth.
- One astronomical unit is defined as the average distance between the earth and the sun.

  1 AU = 149.6 million km = 149.6 × 10^6 km

  = 1.496 × 10^{11} m.



Perihelion and Aphelion position of Earth

Light year

- The nearest star to our solar system is **Proxima Centauri.** It is at a distance of 2,68,770 Au. Using the Au for measuring distances of stars would be unwieldy. Therefore, astronomers use a special unit, called '**light year**'.
- We have learnt that the speed of light in vacuum is 3 × 10^8 m/s. This means that light travels a distance of 3 × 10^8 m in one second. In a year (non-leap), there are 365 days. Each day has 24 hours; Each hour has 60 minutes; Each minute has 60 seconds.

  Thus, the total number of seconds in one year

  = 365 × 24 × 60 × 60

  = 3.153 × 10^7 second
- If light travels a distance of 3 × 10^8m in one second, then the distance travelled by light in one year = 3 × 10^8 × 3.153 × 10^7 = 9.46 × 10^{15} m. This distance is known as one light year.
- One light year is defined as the distance travelled by light in vacuum during the period of one year.

  1 Light year = 9.46 × 10^{15} m.
- In terms of light year, Proxima Centauri is at 4.22 light-years from Earth and the Solar System (and Earth). The Earth is located about 25,000 light-years away from the galactic center.

NUMERICAL PROBLEMS

1. What is the area of a 10 squares each of side of 1 m.

Solution :

Area of a square = side × side

= 1 m × 1 m

= 1 m^2 or 1 square metre

Area of 10 squares = 1 square metre × 10

= 10 square metre

(Even though the area is given in square metre , the surface need not to be square in shape)

2. Find the area of the following regular shaped figures: (Take π = 22/7)

A) A rectangle whose length is 12 m and breadth is 4 m.

B) A circle whose radius is 7 m.

C) A triangle whose base is 6 m and height is 8 m.

Solution :

A. Area of rectangle = length × breadth

= 12 × 4 = 48 m^2

B. Area of circle = π × r^2 = (22/7) × 7 × 7

= 154 m^2

C. Area of triangle = (1/2) × base × height

= (1/2) × 6 × 8 = 24 m^2

3. Find the volume of (Take π = 22/7)

A) a cube whose side is 3 cm.

B) a cylinder whose radius is 3 m and height is 7 m.

Solution :

A. Volume of a cube = side × side × side

= 3 cm × 3 cm × 3 cm

= 27 cubic cm or cm^3.

B. Volume of a cylinder = π × r^2 × height

= (22/7) × 3 × 3 × 7 = 198 m^3.

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9. Milli ampere : micro ampere : : 10^{-3} A : .....
Ans : 10^{-6} A

10. ..... is a common example of the practical application.
Ans : Arc welding

11. An insulator gives a lot of ..... to the flow of charge (electron). **Ans : resistance**

12. Wires made of ....., an electrical conductor, have very low resistance.
Ans : copper

13. The chip which are used in SIM cards and ATM cards are made up of .....
Ans : Semi conductors

14. ..... are used to remove splinters of steel or iron in hospitals dealing with eye injuries.
Ans : Electromagnets

15. Edison used a ..... wire coil is a vacuum glass and discovered the first electric bulb in 1879.
Ans : platinum

16. ..... cells cannot be recharged after use.
Ans : Primary

17. The SI unit of potential difference is .....
Ans : volt (V)

18. The SI unit of resistance is ..... **Ans : ohm**

19. An electric charge always flows from a point at ..... to a point at .....
Ans : higher potential, lower potential

Match the following :

1. **a)** 1 Ma – **1)** series
b) 1 μA – **2)** ohm - metre
c) Ammeter – **3)** 10^{-6} ampere
d) Electrical resistivity – **4)** 10^{-3} ampere

Codes :

	a)	b)	c)	d)
A)	4	3	1	2
B)	3	1	2	4
C)	1	2	4	3
D)	2	4	3	1

Ans : (A)

2. **a)** Current I – **1)** protons, neutrons
b) Resistance R – **2)** $\frac{q}{t}$
c) Nucleus – **3)** σ
d) Electrical Conductivity – **4)** $\frac{V}{I}$

Codes :

	a)	b)	c)	d)
A)	2	4	1	3
B)	4	1	3	2
C)	1	3	2	4
D)	3	2	4	1

Ans : (A)

3. **a)** Dry cells – **1)** Reversible
b) Electrolyte – **2)** Opens or closes the circuit
c) Switch – **3)** Solution
d) Secondary cell – **4)** Torches

Codes :

	a)	b)	c)	d)
A)	4	3	2	1
B)	3	2	1	4
C)	2	1	4	3
D)	1	4	3	2

Ans : (A)

4. **a)** Bulb – **1)** 
b) Cell – **2)** 
c) Battery – **3)** 
d) Switch (closed) – **4)** 

Codes :

	a)	b)	c)	d)
A)	2	3	4	1
B)	3	4	1	2
C)	4	1	2	3
D)	1	2	3	4

Ans : (A)

Find out the correct statement :

1. **Assertion (A)** : Charges flow from higher potential to the lower potential.
Reason (R) : Current flows mainly due to flow of electrons

Select the correct answer :
A) Both **(A)** and **(R)** are true but **(R)** is the correct explanation of **(A)**
B) Both **(A)** and **(R)** are true and **(R)** is the not the correct explanation of **(A)**
C) **(A)** is true but **(R)** is false
D) **(A)** is false but **(R)** is true **Ans : (B)**

2. **Assertion (A)** : Insulators do not allow flow of current through them.
Reason (R) : Insulators have no free charge carrier.

Select the correct answer :
A) Both **(A)** and **(R)** are true but **(R)** is the correct explanation of **(A)**
B) Both **(A)** and **(R)** are true and **(R)** is the not the correct explanation of **(A)**
C) **(A)** is true but **(R)** is false
D) **(A)** is false but **(R)** is true **Ans : (A)**

3. **Assertion (A)** : A current carrying wire should be charged.
Reason (R) : The current in a wire is due to flow of free electrons in a definite direction.

Select the correct answer :
A) Both **(A)** and **(R)** are true but **(R)** is the correct explanation of **(A)**
B) Both **(A)** and **(R)** are true and **(R)** is the not the correct explanation of **(A)**
C) **(A)** is true but **(R)** is false
D) **(A)** is false but **(R)** is true

Ans : (D)

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4. **Assertion (A)** : The connecting wires are made of copper.
   Reason (R) : The electrical conductivity of copper is high.
   Select the correct answer :
   A) Both **(A)** and **(R)** are true but **(R)** is the correct explanation of **(A)**
   B) Both **(A)** and **(R)** are true and **(R)** is the not the correct explanation of **(A)**
   C) **(A)** is true but **(R)** is false
   D) **(A)** is false but **(R)** is true **Ans : (A)**

5. **Assertion (A)** : Copper is used to make electric wires.
   Reason (R) : Copper has very low electrical resistance.
   Select the correct answer :
   A) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**
   B) Both **(A)** and **(R)** are true but **(R)** is not the correct explanation of **(A)**
   C) **(A)** is true but **(R)** is false
   D) **(A)** is false but **(R)** is true
   E) Both **(A)** and **(R)** are false **Ans : (A)**

6. **Assertion (A)** : Insulators do not allow the flow of current through themselves.
   Reason (R) : They have no free charge carriers.
   Select the correct answer :
   A) If both **(A)** and **(R)** are true and the **(R)** is correct explanation of **(A)**
   B) If both **(A)** and **(R)** are true but **(R)** is not a correct explanation of **(A)**
   C) If **(A)** is true and **(R)** is false
   D) If both **(A)** and **(R)** are false **Ans : (A)**

LIGHT

Introduction

✦ Light is a type of energy that helps us to see all the things around us. Light can be detected by the human eyes. We all know that light is essential for vision.

Light is the only source of energy for plants. So, they entirely depend on light. People and animals derive energy from carbohydrates, protein and fat through their food. Plants produce food using the energy from Sun light, carbon-di-oxide and water by the process called as Photosynthesis. Sun light acts a vital role in the process of photosynthesis.

Sources of Light

Objects which are able to emit light are known as light sources. Light rays can come from different sources. There are two types of sources of light.

- Natural sources of light
- Artificial sources of light

Natural Sources of light

✦ Sources which emit light naturally are known as natural sources of light. The Sun is the primary and the major source of natural light. Stars also produce light, in the same way as the Sun do. However, as they are much farther away than the Sun, the light from them are too weak. The moon provides light, particularly in the night. Some living organisms have the ability to produce light named by bioluminescence. It is the effect of certain chemical reactions occurring in the organism. Fireflies, jellyfish, glow worm, certain deep sea plants and some microorganisms can emit light naturally.

Artificial Sources of light

✦ Apart from the natural sources, light can also be produced artificially. The different light sources that are able to produce light artificially can be put under three broad categories.

✦ Artificial sources are man – made light sources such as flame of candle, incandescent lamp, neon lamp, Sodium lamp etc.

✦ **Incandescent Sources :** When certain objects are heated to a high temperature, they begin to emit light. The glowing of hot iron rod is a kind of Incandescent light. **Example :** Candle, incandescent lamp.

✦ **Gas Discharge Sources :** Passing electricity through certain gases at a very low pressure (discharging) can produce light. **Example :** Neon lamp, Sodium lamp

We often use a kind of gas-discharge lamp that uses fluorescence to produce visible light. The electric current in the gas excites mercury vapour, which produces short-wave ultraviolet light that then causes a phosphor coating on the inside of the lamp to glow in visible light.

The moon provides light as well, but it cannot produce light by its own. The light emitted by the Moon is the light of the Sun reflected towards the Earth. When we see the Moon, we see only the Moon's lighted part. Thus, half of the moon is always facing the Sun and receiving light from it. Hence, we receive light from the moon.

Properties of light

Light has some fundamental properties as mentioned below

✦ Rectilinear propagation of light
✦ Reflection
✦ Speed
✦ Interaction of light with matter

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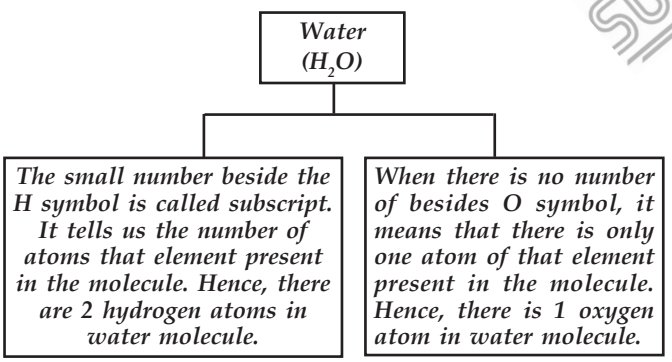
- The formula of a compound indicates (i) elements constituting the compound (ii) the number of each constituent element. In other words, the formula of a compound also represents its chemical composition.
- Often we hear that water is called as H_2O. This is the chemical formula for water molecule. This means that each molecule of water has two hydrogen atoms combined with one oxygen atom. A chemical formula is a symbolic representation of one molecule of an element or a compound. It provides information about the elements present in the molecule and the number of atoms of each element.



Here are some examples of chemical formula

- Sodium Chloride (NaCl) – 1 atom of Sodium and 1 atom of Chlorine
- Ammonia (NH_3) – 1 atom of Nitrogen and 3 atoms of Hydrogen
- Glucose ($C_6H_{12}O_6$) – 6 Carbon atoms, 12 Hydrogen atoms, 6 Oxygen atoms

Common compounds and their chemical formula

Examples of Compounds	
Examples of Formulas for compounds	Examples of names of common compounds
H_2O	Water
$C_6H_{12}O_6$	Glucose
NaCl	Salt (Sodium Chloride)
C_2H_6O	Ethanol
NH_3	Ammonia
H_2SO_4	Sulphuric Acid
CH_4	Methane
$C_{12}H_{22}O_{11}$	Sucrose

Atomicity

- The number of atoms constituting a molecule is known as its atomicity.
- For example, Oxygen exists as a diatomic molecule which means that a molecule of oxygen contains two atoms hence its atomicity is 2.

$O + O \longrightarrow O_2$

(Oxygen atom + Oxygen atom) ⟶ Oxygen Molecule

- Similarly a phosphorus (P4) molecule contains 4 atoms; a sulphur (S_8) molecule contains 8 sulphur atoms. Hence their atomicity is 4 and 8 respectively.
- For molecule containing more than one types of atoms, simply count the number of each atom and that would be its atomicity. For example, a molecule of sulphuric acid (H_2SO_4) consists of 2 hydrogen atom, 1 sulphur atom and 4 oxygen atoms. Hence its atomicity is 2+1+4 = 7.
- One molecule of water (H_2O) contains two atoms of hydrogen and one atom of oxygen, the atomicity of water is three.

Atomicity of some elements

Element	Atomicity	Elements	Atomicity
H	2	F	2
He	1	Ne	1
Li	1	Na	1
N	2	P	4
O	2	S	8

Elements in human body

Nearly 99% of the mass of our human body consists of just 6 chemical elements: oxygen, carbon, hydrogen, nitrogen, calcium, and phosphorus. Another 5 elements make up most of the least percentage point : potassium, sulphur, sodium, chlorine, and magnesium.

Elements in air

Air is a mixture of gases. The molecules of two different elements, nitrogen and oxygen, make up about 99% of the air. The rest includes small amounts of argon and carbon dioxide. (Other gases such as neon, helium, and methane are present in trace amounts.) Oxygen is the life-giving element in the air.

Effect of temperature on solid, liquid and gas

- When heat is supplied to a solid, it expands. The particles move slightly further apart from one another and vibrate vigorously. This cause the volume of matter to increase. During heating or expansion, the mass of matter does not change. This can be explained in the following way.
- During heating, the distance between the particles of the iron locks change. Mass is conserved when matter expands.
- Although the volume of the matter changes, the size and number of the particles of matter do not change. Hence, during heating, the mass of a matter is conserved. For example, in an iron lock the distance between the iron particles increases when they gain enough heat. However, the number of iron particles does not change. Hence the mass of the iron lock is conserved.
- The melting of ice is an example of a change in the states of matter. The change in the states of matter occurs during melting, boiling and freezing and condensation.

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✦ When the particles possess enough energy, they overcome the strong forces of attraction between one another. The particles break free from one another and move randomly. For example, when solid ice is heated to 0°C, it melts to become liquids water. In the same way, liquid water is heated to 100°C, it boils to become steam.

Solid	When solid is heated, the particles gain energy and vibrate more vigorously.
Liquid	Melting occurs when the melting point is reached. The solid changes to its liquid state. When a liquid is heated the particles gain energy and vibrate more vigorously.
Gas	Boiling occurs when the boiling point is reached. The liquid changes to its gaseous State.

✦ A pure solid turns to liquid at a fixed temperature or in other words, conversion of pure substance from solid to liquid takes place at the particular temperature. This particular temperature is called melting point of that particular solid substance. Similarly, when the liquid cools down, it converts into solid at a particular temperature. This temperature is called **freezing point** of the particular liquid substance. The temperature at which a liquid boils and is converted into a gas is **boiling point** of the liquid.

★ Objective Type Questions with Answers ★

Choose the correct answer :

1. **Which of the following is an example of a metal ?**
   A) Iron **B)** Oxygen
   C) Helium **D)** Water **Ans : (A)**
2. **Oxygen, hydrogen and sulphur are examples of which of the following ?**
   A) Metals **B)** Non-metals
   C) Metalloids **D)** Inert gases **Ans : (B)**
3. **Which of the following is a short and scientific way of representing one molecule of an element or compound ?**
   A) Mathematical formula
   B) Chemical formula
   C) Mathematical symbol
   D) Chemical symbol **Ans : (D)**
4. **The metals which is a liquid at room temperature**
   A) Chlorine **B)** Sulphur
   C) Mercury **D)** Silver **Ans : (C)**
5. **An element which is always lustrous, malleable and ductile**
   A) non-metal **B)** metal
   C) metalloid **D)** gas **Ans : (B)**
6. **The graphite refill used in pencil is made of element called .....**
   A) graphite **B)** carbon
   C) silicon **D)** sodium **Ans : (B)**
7. **The smallest unit of an element is .....**
   A) atom **B)** molecule
   C) compound **D)** none **Ans : (A)**
8. **The most abundant type of atom in the universe is .....**
   A) Helium **B)** Hydrogen
   C) Argon **D)** Nitrogen **Ans : (B)**
9. **..... can be formed by the same or different kinds of atoms.**
   A) Atom **B)** Molecule
   C) Gases **D)** None **Ans : (B)**
10. **..... is a substance that is made up of three oxygen atoms chemically combined.**
    A) Oxygen **B)** Hydrogen
    C) Ozone **D)** CO_2 **Ans : (C)**
11. **A molecule containing three atoms is called a ..... molecule.**
    A) monoatomic **B)** diatomic
    C) triatomic **D)** polyatomic **Ans : (C)**
12. **A molecule which contains only one atom is called ..... molecule.**
    A) monoatomic **B)** diatomic
    C) triatomic **D)** none **Ans : (A)**
13. **An atom of oxygen (O) and two atoms of hydrogen (H_2) combine to form a molecule of .....**
    A) hydrogen **B)** ozone
    C) water **D)** none **Ans : (C)**
14. **..... is the first scientist who used the term element.**
    A) Newton **B)** Einstein
    C) Robert Boyle **D)** Robert hook **Ans : (C)**
15. **Matter is its simplest form is called .....**
    A) molecule **B)** metals
    C) element **D)** none **Ans : (C)**

Fill in the blanks :

1. The smallest particle of matter that can exist by itself ..... **Ans : atom**
2. A compound containing one atom of carbon and two atoms of oxygen is ..... **Ans : CO_2**
3. ..... is the only non-metal conducts electricity. **Ans : Graphite**
4. Elements are made up of ..... kinds of atoms. **Ans : same**
5. ..... of some elements are derived from Latin or Greek names of the elements. **Ans : symbol**
6. There are ..... number of known elements. **Ans : 118**

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4. The fully natural fibre is called .....
Ans : plant fibre

5. A natural fibre obtained by boiling of cocoons is called ..... **Ans : silk**

6. Cotton : natural : : polyester : .....
Ans : Synthetic

7. PLA spoon : compostable : : plastic spoon : .....
Ans : Disposable

8. Nylon : melts on heating : : silk : .....
Ans : Burns on heating

9. Polymers are very long chains made of repeating smaller molecules called .....
Ans : monomers

10. All the ..... present in your body are polymers.
Ans : proteins

11. ..... is made of sugar molecules and is the main component of cotton used in clothing.
Ans : Cellulose

12. ..... and ..... are the building block monomers that make up many different types of plastics.
Ans : Ethylene, propylene

13. ..... are long strands of polymers interwoven to form linear, string-like structures. **Ans : fibres**

14. Fibres that are made using raw materials from ..... are synthetic fibres. **Ans : petroleum**

15. The cellulose dissolves in the chemicals added to it and produces syrup called ..... **Ans : Viscose**

16. Nylon is a plastic polymer made of chemical units called ..... **Ans : Polyamides**

17. ..... is a synthetic fibre which strong and elastic that it has the ability to bounce.
Ans : Trampoline

18. Syringe that is made from a type of plastic called .....
Ans : polypropylene

19. Edmund Alexander Parkes was the creator of the first plastic called ..... **Ans : Parkesine**

20. ..... resists fire and can tolerate heat.
Ans : Melamine

21. Poly Lactic Acid or polylactide is ..... and ..... thermoplastic. **Ans : compostable, bioactive**

Match the following :

1.
a) Nylon – **1)** Thermoplastic
b) PVC – **2)** Thermosetting plastic
c) Bakelite – **3)** Fibre
d) Teflon – **4)** Wood pulp
e) Rayon – **5)** Non-stick cookwares

Codes :

	a)	b)	c)	d)	e)	
A)	3	1	2	5	4	
B)	1	2	5	4	3	
C)	2	5	4	3	1	
D)	5	4	3	1	2	**Ans : (A)**

2.
a) Teflon – **1)** Frabrics do not wrinkle easily
b) Nylon – **2)** Used to make non-stick cookwares
c) Polyester – **3)** Prepared by using pulp
d) Rayon – **4)** Used for making parachutes and stockings

Codes :

	a)	b)	c)	d)	
A)	2	4	1	3	
B)	4	1	3	2	
C)	1	3	2	4	
D)	3	2	4	1	**Ans : (A)**

3.
a) Nylon – **1)** Artificial silk
b) PET – **2)** Artificial wool
c) Rayon – **3)** Parachute
d) Acrylic – **4)** Polyester

Codes :

	a)	b)	c)	d)	
A)	3	4	1	2	
B)	4	1	2	3	
C)	1	2	3	4	
D)	2	3	4	1	**Ans : (A)**

4.
a) Plastic bags – **1)** Polyvinyl chloride
b) PVC – **2)** Natural fibre
c) Melamine – **3)** Non-bio degradable
d) Wood – **4)** Thermosetting plastic

Codes :

	a)	b)	c)	d)	
A)	3	1	4	2	
B)	1	4	2	3	
C)	4	2	3	1	
D)	2	3	1	4	**Ans : (A)**

Find out the correct statement :

A) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**
B) Both **(A)** and **(R)** are true but **(R)** is not the correct explanation of **(A)**
C) **(A)** is true but **(R)** is false
D) **(A)** is false but **(R)** is true

1. **Assertion (A)** : Vegetable peels buried in the soil disappear within two weeks.
Reason (R) : Vegetable peels are compostable.
Ans : (A)

2. **Assertion (A)** : It takes a very long time for nylon clothes to breakdown into microfibers but cotton clothes need only six months to decompose.
Reason (R) : Nylon made out of petrochemicals is non-biodegradable and cotton cloth is biodegradable.
Ans : (A)

3. **Assertion (A)** : It is good to avoid plastics.
Reason (R) : Plastics end up polluting the environment. **Ans : (A)**

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CHEMISTRY IN DAILY LIFE

Introduction

- Chemistry has influenced our life so much that we do not even realise that we come across chemicals at every movement.
- The principles of chemistry have been used for the benefit of mankind.
- In 1971, during the Bangladesh liberation war Dr. Dilip Mahalanabis demonstrated the dramatic life-saving effectiveness of **oral rehydration** therapy when cholera broke out among the refugees from Bangladesh. Further, field trial conducted during the cholera outbreak in Manipur attested the efficacy of Oral Rehydration Solution (ORS). Since then ORS saved the lives of millions around the world.
- In the healthy intestine, there is a continuous exchange of water through the intestinal wall. When a person becomes sick, due to diarrhea, more water is expelled and the body is not able to retain its liquid balance. This situation is called as '**dehydration**'. It is important to note that, it is not the diarrhea that kills, but the dehydration resulting from the infection that kills. If more than 10% of the body's fluid is lost, it lead to death.

UNICEF/WHO norms the ORS should be prepared as follows :

New ORS	Grams/Litre	%	New ORS	mmol/litre
Sodium chloride	2.6	12.683	Sodium	75
Glucose, anhydrous	13.5	65.854	Chloride	65
Potassium chloride	1.5	7.317	Glucose, anhydrous	75
Trisodium citrate, dehydrate	2.9	14.146	Potassium	20
			Citrate	10
Total	20.5	100.00	Total Osmolarity	245

Oral Rehydration Solution (ORS)

- ORS (Oral Rehydration Solution) is a special combination of dry salts that is mixed with safe water. It can help to replace the fluids lost due to diarrhea. In a state of diarrheal disease there is imbalance and more water is secreted than reabsorbed, causing a net loss to the body which can be as high as several liters a day. In addition to water loss, sodium and potassium are also lost.
- Certain concentration of sodium (Na) is needed for proper functioning of the body. For example, only with adequate sodium concentration in the intestinal wall, water can be absorbed by it through a process known as osmosis. If there is inadequate salt in the intestinal wall the body will not be able to absorb water.
- The saline bottle directly transfers water and sodium into the blood stream. It is found that, if the saline water is administered through mouth, intestinal wall is not able to absorb neither water nor sodium. Dr. Dilip Mahalanabis found that if glucose (sugar) is added to the salt solution, then all the three - water, sodium and glucose can be absorbed by the body.
- During diarrhea the intestine is still able to absorb glucose molecules. Thus, the ORS solution uses the glucose molecules to enable the sodium to be carried through by a co-transport coupling mechanism. ORS is an effective treatment for 90 – 95% of patients suffering from diarrhea, regardless of the cause. As the water is replaced, balance is attained saving the patience in most cases.

Antacid

- Acidity is a set of symptoms caused by excess production of acid by the gastric glands of the stomach. Our stomach naturally produces gastric or hydrochloric acid (HCl) to help digest and break down food. Acidity issues arise when there is excess production of this acid due to triggers such as acidic foods, spicy food, alcohol, dehydration and stress. When acidity occurs, the excess acid may move up from stomach to esophagus.
- The lining of our stomach is designed as such to withstand a high acidic environment at the range of pH level 1 to 3.
- When we have acidity or heartburn, we are administered a class of medicines known as antacids. They are actually weak bases. As learned in chemistry, when a base is mixed with an acid a neutralization reaction occurs. When antacids are consumed, it creates a chemical reaction in the stomach lowering the acidity and makes the digestive acids less corrosive and damaging.
- Most of the common antacids are **Sodium Bicarbonate ($NaHCO_3$), Calcium Carbonate ($CaCO_3$), Magnesium Hydroxide ($Mg(OH)_2$), Magnesium Carbonate ($MgCO_3$) and Aluminium Hydroxide $Al(OH)_3$.**
- The chemical reaction created when Magnesium Hydroxide neutralizes HCI in the stomach and intestine.

Antibiotics

- The discovery of antibiotics was an accident, which happened in 1928 while a British bacteriologist,

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Dr. Alexander Fleming was involved in research on **staphylococcus bacteria.** This bacterium was meant to cause deadly diseases such as pneumonia, sour throat, etc.

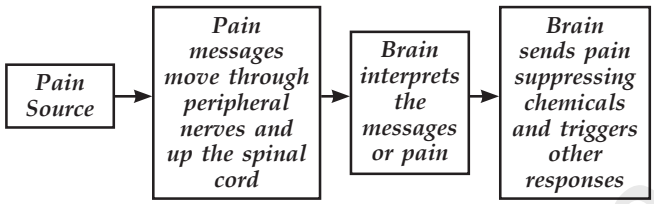
- On further research, Fleming identified that the **"mold juice"** was capable of killing a wide variety of harmful bacteria, such as streptococcus, meningococcus and diphtheria bacillus.
- Fleming named the mould as penicillum notatum, from which the antibiotic penicillin was isolated. However, Fleming was not the first one to use moulds and other living micro organisms to treat infections. Thousands of years ago, the ancient Egyptians, had used mouldy bread to treat infected wounds. Similar practices were observed among ancient Greeks, Serbians and even among Indians. While these were perhaps partially effective, their efficacy is nowhere near the modern antibiotics.
- Naturally, many micro organisms and plants synthesize chemicals which are toxic in nature to protect them from invading organisms. The biosynthesized chemicals isolated from the plants/ micro organisms and used as medicines against infectious diseases. These substances were called as antibiotics. Ex : Chloramphenicols, tetracyclines, Penicillin derivatives, cephalosporin's and their derivatives.
- However, the over use of antibiotics makes it inactive or less effective. Antibiotic resistance is defined as the ability of the microorganisms to resist the effects of an antibiotic to which they were once sensitive. Thus the antibiotics become less effective and we are forced to either consume a larger dose or shifting towards the use of other virulent variants of antibiotics. Thus the research on antibiotics is of great importance to combat the virulent and mutated microorganisms.

Antibiotics don't work for viruses like cold and the flu.

Analgesics

- Analgesics or pain killers are the pain-suppressing chemicals released by the body. They suppress the feeling of 'pain'. This analgesics drug selectively relieves pain by acting either in CNS (Central Nerves System) or on peripheral pain mechanism, without significantly altering consciousness.
- When we are affected by fever, often we are administered Paracetamol. Paracetamol interact with the receptors and reduce the intensity of pain signals to the brain, also suppresses the release of substances, called prostaglandins that increase pain and body temperature.

Anesthetics : The first local anesthetic used was cocaine. It was isolated from **coca leaves by Albert Niemann in Germany, 1860.**



Traditional anti inflammatory agents

- Non-Narcotic (Non-additive) analgesics. Eg : Aspirin
- Narcotic drugs. Eg : Codeine

Antipyretic

An Antipyretic is a substance (or) drug that is administered to reduce the fever. Generally, temperature of our body is maintained at 98.4 to 98.6 degrees Fahrenheit. If the temperature shoot up this level, it can be said as fever. Fever is mostly caused by infection.

Usually Bacteria and virus cannot thrive above a certain temperature. To defend the invading virus and bacteria the immunity system increases the body temperature.

Once infection is sensed, the immune system releases a chemical called **pyrogen.** These pyrogens released into bloodstream reaches the hypothalamus, present at the basal part of the brain. **The function of Hypothalamus is to control the body temperature.** Sensing the pyrogens, hypothalamus increases the body temperature by releasing a chemical called **prostaglandin.**

Normally little fever is good as it helps to arrest the growth of infection. However if the internal body temperature exceeds 105°F, this may cause damage to our body protein and the brain may experience seizures and delirium. The prolonged high fever may also cause death.

Antipyretics (anti - against and pyretic - feverish) are chemical substances that reduce fever. They suppress the release of prostaglandin and reduce fever. The most common and well known anti-pyretic is **paracetamol.** Other antipyretics and anti inflammatory agents are **Aspirin, Ibuprofen, Diclofenac.**

Antispetic

Antiseptics are substances applied to the exterior of a body that kill or inhibit microbes and infective agents. Antiseptics can be effective against one or a combination of bacteria, fungi, viruses or other microorganisms.

- Dettol → Mixture of chloroxylenol and teripincol
- Tincture → Iodine + alcohol (2 to 3%), Iodoform, Phenolic solutions, Ethanol, Boric acid
- Natural antiseptics → Garlic, Turmeric, Aloevera

Difference between Antiseptic and Disinfectants

Antiseptic	Disinfectants
All antiseptic are disinfectants.	All disinfectants are not antiseptic
It can be applied on the live tissues. For example Skin / Mucous	It can be apply on the animate object. For example Surface, lab working tables, floor.

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Antihistamine

- Antihistamines are drugs that can be used to treat allergy symptoms by blocking the effects of histamines.
- Histamine is a chemical messenger involved in number of complex biological reactions. When a foreign body such as pollens enters the body, the immune system believes those substances to be harmful and generates the release of histamine. When histamine is released, it will interact with the histamine receptors on the cell surface or within a target cell and cause changes in the bodily functions. This stimulates many smooth muscles to contract, such as gastrointestinal tract and bronchi. In certain smooth muscles, they cause relaxation of blood capillaries which increase the flow of lymph and its protein content and lead to the formation of edema (redness and rashes).
- Antihistamines or histamine receptor antagonists oppose selectively all the pharmacological effects of histamines. Examples of antihistamine are: Diphenhydramine, chlorpheniramine, cimetidine. The adverse effects of antihistaminics are mouth dryness and sleepiness.

Medicine

"Diagnose the disease and understand its seeds;
Identify the cause and make sure it succeeds". **– Kural**

Medicines are intended to treat the disease and to improve our health. There are many ways to intake the medicine. They are :

1. Oral use
2. External use
3. Injections (Intra muscular / Intra venous)

Combustion

- The science behind the rusting of iron, burning coal and the flame of candle is **combustion.** Combustion is a chemical reaction that occurs in the presence of a fuel and an oxidizing agent that produces energy, usually in the form of heat and light. (Burning → Combustion reaction). In fact combustion is one of the first chemical reactions intentionally harnessed by humans.
- Any reaction that involves reaction with oxygen is called oxidation reaction. In the combustion of hydrocarbon with oxygen, typically carbon dioxide and water are produced.

$$CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O + \text{Heat energy}$$

(Hydrocarbon) (Oxygen) (Carbon dioxide) (Water)

- All combustion reactions are exothermic ; that is they release heat.

Ignition Temperature

- The minimum temperature at which a substance catches fire and burns is called its ignition temperature.
- Substances which have very low ignition temperature and can easily catch fire with a flame are called inflammable substances. Eg: Petrol, Alcohol, LPG (Liquefied Petroleum Gas), CNG (Compressed Natural Gas), etc.

Flame

Flame is actually a chemical reaction. To be specific, the flame is a mixture of gases (vaporized fuel, oxygen, carbon dioxide, carbon monoxide, water vapor, and many volatile materials) and so is matter. The light and heat produced by the flame is energy, not matter. But fire is a matter.

Fire Chemical Reaction = Oxygen + Heat + Fuel = Fire

Flame and its structure

- White flame – Epsom salt ($MgSO_4$)
- Violet flame – Lithium Chloride
- Indigo flame – Potassium Chloride
- Blue flame – Bleaching powder
- Green flame – Borax powder
- Yellow flame – Calcium Chloride
- Orange flame – Table salt
- Red – Strontium Chloride

- Flame is a zone of combustions of a combustible substance. Substances which vaporize during burning produce flames. Eg: wax, kerosene, etc. Substances which do not vaporize during burning do not produce flames. Eg: coal.

A candle flame has three main zones, they are :

- **The outer zone :** Complete combustion of the fuel takes place and the colour of the flame is blue and is the hottest part of the flame. It is the non-luminous part of the flame.
- **The middle zone :** Partial combustions of the fuel takes place and the colour of the flame is yellow and is moderately hot part of the flame. It is the luminous part of the flame.
- **The inner zone :** There are unburnt vapours of the fuel and the colour is black and is least hot part.

A candle flame is caused by vapour burning above the candle. This burning vapour is hotter than the surrounding air and is therefore less dense. So, by the principle of convection, it "rises" so the flame is always upwards.

Calorific values of different fuels

Fuel	Calorific Value (kJ/kg)
Cow dung cake	6000-8000
Wood	17000-22000
Coal	25000-33000
Petrol	45000
Kerosene	45000
Diesel	450000
Methane	500000

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BASIS OF CLASSIFICATION

Introduction

- We can see various plants and animals around us. It is estimated that about 8.7 million species of living organisms have been identified and named till now. However many scientists believe that, only a small portion of the total species existing on earth has been identified. In order to know about the behavior and relationship among organisms, that are known, biologists have classified them into two broad groups, (i.e) plants and animals. Grouping of living organisms based on their common features is known as biological classification.
- The dichotomous key allows us to make quick reference and identify a particular thing. Classification provides scientists a systematic easy way of studying organisms. Classification is done using this dichotomous key.
- Dichotomous key is a tool used to classify organisms based on their similarities and differences.

Features of dichotomous key

- A single feature that differentiates a group easily.
- One character selected to separate the group, as present or absent.

Aristotle was a Greek philosopher and thinker who lived about 2400 years ago. Aristotle came up with the following grouping system that was used for almost 2000 years after his death.

- He classified all organisms into either animals or plants.
- Then he classified into those 'with blood' and those 'without blood'.
- Then the animals are classified into three groups based on their method of movement: walkers, flyers or swimmers.

Basics of Classification

Living organisms are so large in number that they need to be classified into smaller groups. Classification of living organisms is made on the basis of their characteristics, similarities and differences.

Classification

The method of arranging the organisms into groups is called classification. When we classify things we put them into groups based on their characteristics.

Need for Classification

- Classification is needed to identify an organism correctly.
- It helps to know the origin and evolution of an organism.
- To establish the relationship among different organisms.
- It provides the information about living things in different geographical regions.
- It helps in understanding how complex organisms must have evolved from simpler ones.

Scientists have been able to discover and classify more than 2 million organisms on the earth ranging from tiny bacteria to the largest blue whales. Each organism has been classified in a category based on its evolutionary relationship with other group of organisms. We can define hierarchy of organisms as :

"The system of arranging taxonomic categories in a descending order based on their relationships with other group of organism is called hierarchy of categories". This system was introduced by **Linnaeus and is called Linnaean hierarchy.** There are seven main categories of hierarchies namely, Kingdom, Phylum, Class, Order, Family, Genus and Species. Species is the basic unit of classification.

Different phylum, with general features and examples of different phyla and classes

No	General Characters	Division
1.	Microscopic unicellular, pseudopodia, flagella and cilia for locomotion, reproduce by fission or conjugation.	Phylum Protozoa Eg. Amoeba, Euglena and Paramoecium
2.	Multicellular organisms with holes in the body. Skeleton formed of spicules, asexual and sexual reproduction.	Phylum Porifera Eg. Leucosolenia, Spongilla, Sycon.
3.	Multicellular organisms Diploblastic, sessile or free swimming, solitary or colonial, asexual and sexual reproduction	Phylum Coelenterata Eg. Hydra, Sea anemone, Jelly fish, Corals.
4.	Acoelomates, parasites inside the body of animals and human beings, mostly hermaphrodite (bisexual).	Phylum Platyhelminthes Eg. Planaria, Liver fluke, Blood fluke, Tapeworm
5.	Unsegmented body, mostly parasites in human beings and animals, causing diseases, asexual reproduction.	Phylum Aschelminthes or Nematoda Eg. Ascaris lumbricoides
6.	Triploblastic, segmented body, mostly hermaphrodite (bisexual and unisexual).	Phylum Annelida Eg. Earthworm, Nereis, Leech.

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No	General Characters	Division
7.	Segmented body, thick chitinous cuticle forming an exoskeleton, paired and jointed legs, unisexual exhibits sexual dimorphism.	Phylum Arthropoda Eg. Crab, Prawn, Millipede, Insects, Scorpion, Spider
8.	Soft bodied, unsegmented, muscular head, foot and visceral mass, mantle, a calcareous shell, sexual reproduction.	Phylum Mollusca Eg. Cuttle fish, Snail, Octopus
9.	Exclusively marine, spines and spicules over the body, water vascular system, tube feet, for feeding, respiration and locomotion, sexual reproduction.	Phylum Echinodermata Eg. Starfish, Sea – Urchin, Brittle star, Sea cucumber and Sea- lily
	Phylum - CHORDATES	
10.	Aquatic, cold blooded vertebrates with boat shape body and jaws, locomotion by paired and median fins, sexual reproduction.	Class Pisces Eg. Shark, Catla, Mullet, Tilapia
11.	Amphibious, cold- blooded, two pairs of limbs, sexual reproduction.	Class Amphibia Eg. Frog, Toad, Salamander, Caecilian
12.	Cold- blooded , lung breathing, scales over the body, pentadactyl limb, adapted for climbing, running and padding, oviparous.	Class Reptilia Eg. Garden lizard, House lizard, Turtles, Tortoise, Snakes, Crocodile
13.	Warm blooded, exoskeleton of feathers, flight adaptation, spongy bones with air cavities, powerful eyes, sexual reproduction, oviparous.	Class Aves Eg. Wader bird, Roller bird, Hoopoe bird, Parrot, Sparrow, Hen, Ostrich, Kiwi
14.	Terrestrial warm blooded, external ear or pinna, muscular diaphragm, non – nucleated RBC, heterodont and diphyodont dentition, viviparous give birth to young ones.	Class Mammalia Eg. Duck bill Platypus, Kangaroo, Cat, Dog, Tiger, Zeebra, Man

Classification of plants

Based on dichotomy, plants also can be classified into two main groups – Flowering and Non – flowering. Non – flowering plants do not produce seeds and flowering plants produce seeds. Based on their nature of plant body, Non – flowering plants are classified into three types : algae, mosses and ferns. Based on their fruit body, flowering plants are classified into two types : gymnosperms and angiosperms.

Algae

- ✦ Plant is thallus, not well-differentiated into root, stem, and leaves.
- ✦ They are predominantly aquatic.
- ✦ They are unicellular or multicellular - filamentous. Example - Chara

Mosses

- ✦ Plant body is not differentiated into true root, stem and leaves.
- ✦ They are water living plants, needs moisture to complete its life cycle. Hence they are referred to as amphibious plants.
- ✦ They do not have any specialized vascular tissues for conduction of water and food. Examples : Funaria

Ferns

- ✦ Plant body is well-differentiated into root, stem, and leaves. Leaves may be large or small.
- ✦ Specialized vascular tissues are found for the conduction of water and food.
- ✦ Basically they are the first land plants which grow well in shady, moist, and cool places. (Examples: Adiantum)

Gymnosperms

- ✦ Plants are perennial, woody, evergreen with true root, stem and leaves.
- ✦ They possess vascular tissues, xylem without vessels and phloem without companion cells.
- ✦ Ovules are naked, without ovary. Hence they do not produce fruits. Seeds are naked.

(Examples: Pinus, Cycas)

Angiosperms

- ✦ Plant body is well differentiated into true root, stem, and leaves.
- ✦ They produce flower with four whorls (calyx, corolla, androecium and gynoecium), hence known as flowering plants.
- ✦ Female reproductive organ, ovary is present inside the flower which develops into fruit and ovule develops into seed.
- ✦ Plants possess well developed vascular system with xylem vessels and phloem – companion cells.

Angiosperms are the dominant plant forms of present day. Based on the number of cotyledons, angiosperms

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Selecting Text with Mouse

Following steps are to be followed :

- ✦ Insertion point is moved to the start of the text to be selected.
- ✦ The left mouse button should be clicked, held down and dragged across the text to be selected.
- ✦ When the intended text is selected, the mouse button should be released.

Selecting Text with Keyboard

Following are the steps to be followed:

- ✦ Insertion point is moved to the start of the text to be selected.
- ✦ The Shift key is pressed down and the movement keys are used to highlight the required text.
- ✦ When the Shift key is released, the text is selected.

Cut and Copy

The main difference between Cut and Copy is that cut removes the selected data from its original position while copy creates a duplicate of the original content.

Moving the Text

The selected text can be easily cut and pasted in the required location. Following steps are to be followed.

- ✦ The text to be moved to a new location is selected.
- ✦ Edit → Cut is selected or in the tool bar is selected to cut the selected text.
- ✦ Insertion point is moved to the place where the text is to be pasted.
- ✦ Edit → Paste is selected or in the tool bar is selected to paste the text in the new location. The text can also be pasted in this way to another or another type of document.
- ✦ The following keyboard shortcuts can be used to move text.

  Ctrl + X → to Cut

  Ctrl + V → to Paste

Copying the Text

- ✦ The text to be copied is selected.
- ✦ Edit → Copy is selected or is clicked.
- ✦ The insertion point is selected where the copy of the text should appear and is clicked.
- ✦ The following keyboard shortcuts can also be used for copy and paste:

  Ctrl + C → to Copy

  Ctrl + V → to Paste

Formatting Options

Almost all the formatting options are available under Format menu. LibreOffice Writer also conveniently provides buttons for the most commonly used options. But before these options can be used, the text on which they are to be used has to be selected. Once the desired portion of the text is selected then depending on the need any one of the following buttons are clicked:

Click B to make text Bold.

Click I to make text Italic.

Click U to make text Underlined.

- ✦ The same can also be achieved by clicking on Format → Character
- ✦ Alternatively Ctrl + B, Ctrl+I and Ctrl+U keys can be used to make the selected text bold, italic and underlined respectively.

Changing the Fonts

- ✦ A font is a set of characters and numbers in a certain style. Each font looks different from other fonts.
- ✦ Click the down arrow in the Fonts Combo box of font tab in Character dialog box.
- ✦ Use Format → Character to open the Character dialog box.
- ✦ From the list of available fonts, click the required one.
- ✦ The text changes to the selected font.

Font Size

- ✦ The size of the text is also important. The same size of the text cannot be used for a legal document, and an advertisement material.
- ✦ Click the down arrow in the Size combo box of Fonts tab in Character dialog box.
- ✦ The text changes to the selected font size.

Changing the Font Colour

- ✦ A different colour for selected text can be used. Colour printers are becoming more and more popular. With the help of a colour printer, some splash can be added to the documents by changing the colour of text.
- ✦ To use a different text color, select the text and click the arrow in the Font Colour icon. A colour palette is displayed from which the required colour can be selected.
- ✦ Alternatively, select the text and click on the Font color icon, to apply the current colour of the Font Colour.

Paragraph Alignment

- ✦ Paragraph alignment refers to the appearance of the left and right sides of the paragraph. By default, Word aligns paragraphs to the left. We can align paragraphs in Word so the right sides are symmetrical. This is called right alignment. We can also align them so you center the lines with even space on both sides. This is called center alignment. Finally, we can justify the alignment, which aligns both the left and right sides.
- ✦ Four types of alignment can be selected, and the best way to make a change is to use the Formatting toolbar.

Following steps are used

- ✦ To change the alignment of one paragraph, first click within that paragraph.
- ✦ To change the alignment of several paragraphs, select the ones needing change.

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Changing Page Orientation

Usually the length of a document will be more than the width. This orientation is called portrait. But in some of the documents the width will be more than the length. This type of orientation is called landscape. The default orientation is portrait.

To change the orientation or paper size, the following steps are used:

- ✦ The Format Page option is clicked.
- ✦ Click the Page tab, if necessary.
- ✦ Select the necessary paper format from the Format drop-down list in the Page. Format section. Or enter the values in the Width and Height spin boxes.
- ✦ For changing the orientation Portrait or Landscape radio buttons are used.

Changing Margins Using Rulers

If the user is not having the exact value for the margins then the Ruler option on the View menu can be used to change the margins.

Following steps are used in this method:

- ✦ If the ruler is not displayed in the screen, View → Ruler option is clicked.
- ✦ The gray area of the ruler indicates the margin's top area.
- ✦ The mouse pointer is then moved in between the gray and white area of the ruler.
- ✦ When the pointer is in the right spot, it changes into a line with arrows on both sides
- ✦ The margin guide is dragged to a new location.

★ Objective Type Questions with Answers ★

Choose the correct answer :

1. The Keyboard shortcut is used to copy the selected text
A) Ctrl+C **B)** Ctrl+V
C) Ctrl+X **D)** Ctrl+A
Ans : (A)

2. The Keyboard shortcut is used to cut the selected text
A) Ctrl+C **B)** Ctrl+V
C) Ctrl+X **D)** Ctrl+A
Ans : (C)

3. How many types of page orientation are there in Libre office Writer?
A) 1 **B)** 2
C) 3 **D)** 4 **Ans : (B)**

4. If the ruler is not displayed in the screen, ... option is clicked.
A) View → ruler **B)** view → task
C) file → save **D)** edit → paste
Ans : (A)

5. The menu is used to save the document
A) file → open **B)** file → print
C) file → save **D)** file →close
Ans : (C)

6. ..... is a powerful and free office suite, used by millions of people.
A) LibreOffice **B)** Microsoft window
C) JAVA **D)** HTML **Ans : (A)**

7. ..... can create and edit forms, view and relations.
A) Calc **B)** Impress
C) Base **D)** Math
Ans : (C)

8. ..... is the LibreOffice formula or equation editor.
A) Impress **B)** Drawing
C) Base **D)** Math
Ans : (D)

9. The menu is used to print the document
A) File → open **B)** File → print
C) File → save **D)** File → close
Ans : (B)

10. A ..... is a set of characters and numbers in a certain style.
A) Font **B)** Bullets
C) Underline **D)** Paragraph
Ans : (A)

11. ..... alignment refers to the appearance of the left and right sides of the paragraph.
A) Right **B)** Left
C) Paragraph **D)** None
Ans : (C)

12. How many types of alignments can be selected in LibreOffice ?
A) two **B)** three
C) four **D)** five
Ans : (C)

13. A ..... orientation means a horizontal display.
A) Landscape **B)** Portrait
C) Both **(A)** and **(B)** **D)** None of these
Ans : (A)

14. A ..... page is shorter in height but wider in width
A) Landscape **B)** Portrait
C) Both **(A)** and **(B)** **D)** None of these
Ans : (B)

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7th Standard

Social Science

HISTORY

- Sources of Medieval India
- Emergence of New Kingdoms in North India
- Emergence of New Kingdoms in South India : Later Cholas and Pandyas
- The Delhi Sultanate
- Vijayanagar and Bahmani Kingdoms
- The Mughal Empire
- Rise of Marathas and Peshwas
- New Religious Ideas and Movements
- Art and Architecture of Tamil Nadu
- Jainism, Buddhism and Ajivika Philosophy in Tamil Nadu

GEOGRAPHY

- Interior of the Earth
- Landforms
- Population and Settlement
- Resources
- Tourism
- Exploring Continents – North America and South America
- Map Reading
- Natural Hazards – Understanding of Disaster Management in Practice

CIVICS

- Equality
- Political Parties
- State Government
- Media and Democracy
- Women Empowerment
- Market and Consumer Protection
- Road Safety

ECONOMICS

- Production
- Tax and its importance

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HISTORY

SOURCES OF MEDIEVAL INDIA

- The period between 700 CE and 1200 CE is classified as Early Medieval period and the period between 1200 CE and 1700 CE as Later Medieval period. The sources for these periods have been left by Arab, Persian and Turkish travellers. Inscriptions, coins and monuments are other source of information. These informations must be carefully deciphered, as they are sometime onesided.
- As Khafi Khan, a courtier of Emperor Aurangazeb said, 'It is the duty of an historian to be faithful, to have no hope of profit, no fear of injury, to show no partiality on one side, or animosity on the other, to know no difference between friend and stranger, and to write nothing but with sincerity'.
- The sources can be classified into primary sources and secondary sources.
- Primary sources are inscriptions, coins and monuments. Secondary sources are travelogues, literary works, chronicles, biographies and auto biographies.
- Inscriptions are carved on stones in temples and walls of palaces and important buildings. They are carved in copper plates, metal sheets. They eulogise the victories of kings and extensive donations made by kings and the rich merchants.
- Various types of lands gifted by the Chola kings are known from the inscriptions and copper plates. They are :

Vellanvagai	land of non-brahmin proprietors
Brahmadeya	land gifted to Brahmins
Shalabhoga	land for the maintenance of a school
Devadana	land gifted to temples
Pallichchandam	land donated to Jaina institutions

- The inscriptions were treated as legal documents. In course of time copper plates were replaced by palm leaves and paper which were cheaper. Most copper plates differ in contents. They provide the details of giver and receiver. However, the giver was not given more importance.
- Tiruvalangadu plates of Rajendra Chola I and the Anbil plates of Sundara Chola are notable examples. Uttiramerur inscriptions in Kanchipuram district provide details of the way in which the village administration was conducted.

Monuments :

- Temples, palaces, mosques, tombs, forts, minars and minarets are called by the collective name monuments.
- The Sultans of Delhi introduced a new type of architecture. The monuments they built had arches, domes and minarets as the main features. The inscriptions in these monuments contain rich information, which can be used to construct history. The medieval Khajuraho temples (Madhya Pradesh) and temples in Konark (Odisha) and Dilwara (Mt.Abu, Rajastan) constitute valuable sources to understand the religion-centered cultural evolution in northern India. Temples in Thanjavur (Brihadeshwara), Gangaikonda Cholapuram and Darasuram symbolise the magnificent structures the Later Cholas built in Tamil Nadu. Vitala and Virupaksha temples at Hampi similarly speak of the contribution of Vijayanagara rulers (15th century).
- Quwwat-ul Islam Masjid, Moth-ki-Masjid, Jama Masjid, Fatehpur Sikri Dargah (all in and around Delhi) and Charminar (Hyderabad) are the important mosques belonging to the medieval times.
- The forts of historical importance are Agra Fort, Chittor Fort, Gwalior Fort and Delhi Red Fort as well as the forts of Daulatabad (Aurangabad) and Firoz Shah Kotla (Delhi). Palaces in Jaipur, Jaisalmer and Jodhpur signify the greatness of the Rajput dynasty that wielded enormous power from these places. Qutb Minar and Alai-Darwaza, the tombs of Iltutmish, Balban and all the Mughal rulers are the other prominent structures recognised as valuable sources of information. Cities in ruin such as Firozabad and Tughlaqabad in north India and Hampi in south India remain rich repositories of the history of medieval India.

Coins :

- Coins issued by various kings bearing their figures, names, titles, dynasties, places are rich source of information. They picturise the economic condition of that period. Coins exhibit king's achievements like military conquests, territorial expansion, construction of temples etc.
- Muhammad Ghori had stamped the figure of Goddess Lakshmi on his gold coins and had his name inscribed on it. This coin tells us that this early Turkish invader was in all likelihood liberal in religious outlook.
- Copper Jitals are available for the study of the period of the Delhi Sultans. Silver Tanka introduced by Iltutmish, Ala-ud-din Khalji's gold coins, Muhammad-bin-Tughluq's copper token currency are indicative of coinage as well as the economic prosperity or otherwise of the country of the time.

A jital contained 3.6 grains of silver. Forty-eight jitals were equal to 1 silver tanka.

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Literature

- Devotional literature is rich source of information.
- The Chola period was known as the period of devotional literature and works such as Kamba Ramayanam, Sekkizhar's Periyapuranam, Nalayira Divyaprabhandham, composed by 12 Azhwars and compiled by Nathamuni, Devaram composed by Appar, Sambandar and Sundarar and compiled by Nambiyandar Nambi, Manikkavasakar's Thiruvasagam, all were scripted during the Chola times. Jayadeva's Gita Govindam (12th century) was a follow-up of the Bhakti Movement in South India. Kabir Das, a 15th century mystic poet, also had an influence on the Bhakti Movement in India.

Secular Literature

- Madura Vijayam and Amuktamalyatha were poems composed by Gangadevi and Krishnadevaraya respectively that help us gain insight into the events and individuals associated with the Vijayanagara Empire. Chand Bardai's Prithiviraj Raso portrays the Rajput king's valour. We have no Indian accounts about what happened during the Turkish invasion of India. For pre-Islamic periods, the only exception was Kalhana's Rajtarangini (11th century).

Books, Biographies, Autobiographies

Books	Author	About
Tabakat-i-Nasiri (slave dynasty)	Minhaj-us-Siraj	The conquest of Muhammad Ghori to A.D. 1260.
Taj-ul-Ma'asir (13th century)	Hasan Nizami	It provides information about Qutb-ud-din Aibak
Tarikh-i-Firoz Shahi	Zia-ud-Barni, a courtier of Muhammad Tughluq	It deals with the history of Delhi Sultanate from Ghiyas-ud-din Balban to the early years of the reign of Firoz Shah Tughluq.
Tarikh-i-Frishta (16th century)	Ferishta	It deals with the history of the rise of the Mughal power in India.
Babur Nama (16th century)	Babur	It gives detailed information about these two emperors (Babur & Akbar)
Ain-i-Akbari (16th century)	Abul Fazal	
Tuzk-i-Jahangiri (17th century)	Jahangir	It throws a lot of light on Jahangir period
Tabakat-i-Akbari	Nizam-ud-din Ahmad	It is considered reliable than the exaggerated account of Abul Fazal.
Tarikh-i-Badauni (1595)	Badauni	The volume on Akbar's reign is a frank and critical account of Akbar's administration, particularly of his religious policy.

Tabakat is an Arabic word meaning generations or centuries.
Tuzk is a Persian word meaning autobiography.
Tarikh or Tahquiq are Arabic words meaning history.

Travellers and Travelogues

- Marco Polo, a Venetian traveller, visited when the Pandya kingdom was becoming the leading Tamil power in the 13th century. Marco Polo was twice in Kayal, which was a port city (presently in Thoothukudi district of Tamilnadu). It was full of ships from Arabia and China. Marco Polo tells us that he himself came by a ship from China. According to Marco Polo, thousands of horses were imported into southern India by sea from Arabia and Persia.
- Al-Beruni (11th century) accompanied Mahmud of Ghazni in one of his campaigns, and stayed in India for 10 years. The most accurate account of Mahmud's Somnath expedition is that of Alberuni. As learned man and a scholar, he travelled all over India. He learnt Sanskrit and studied the philosophy of India. In his book Tahquiq-i-Hind, Alberuni discussed the Indian conditions, systems of knowledge, social norms and religion.
- Ibn Battuta (14th century), an Arab-born Morocco scholar, travelled from Morocco right across North Africa to Egypt and then to Central Asia and India. His travelogue (Rihla [The Travels]) contains rich details about the people and the countries he visited. According to him, Egypt was rich then, because of the whole of the Indian trade with the West passed through it.
- Ibn Battuta tells us of caste in India and the practice of sati. We learn from him that Indian merchants were carrying on a brisk trade in foreign ports and Indian ships in the seas.
- He describes the city of Delhi a vast and magnificent. Those were the days when Sultan Muhammad bin Tughluq transferred his capital from Delhi to Devagiri (Daulatabad) in the south, converting Delhi into a desert.
- In the South, Vijayanagar had many foreign visitors who left behind their detailed accounts of the state. An Italian named Nicolo Conti came in 1420. Abdur-Razzaq came from Heart (the court of Great Khan in Central Asia) in 1443.
- Domingo Paes, a Portuguese traveller, visited the city in 1522. All of them recorded their observations, which are very useful for us today to know the glory of the Vijayanagar Empire.

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★ Objective Type Questions with Answers ★

Choose the correct answer :

1. **..... are the writings engraved on solid surfaces such as rocks, stones, temple walls and metals.**
   A) Chronicles **B)** Travelogues
   C) Coins **D)** Inscriptions **Ans : (D)**
2. **..... was the land gifted to temples.**
   A) Vellanvagai **B)** Shalabhoga
   C) Brahmadeya **D)** Devadana **Ans : (D)**
3. **..... period was known as the period of devotional literature.**
   A) Chola **B)** Pandya
   C) Rajput **D)** Vijayanagara **Ans : (A)**
4. **..... provides information about the first Sultan of Delhi.**
   A) Ain-i-Akbari **B)** Taj-ul-Ma'asir
   C) Tuzk-i-Jahangiri **D)** Tarikh-i-Frishta
   Ans : (B)
5. **....., an Arab-born Morocco scholar, travelled from Morocco to India.**
   A) Marco Polo **B)** Al Beruni
   C) Domingo Paes **D)** Ibn Battuta **Ans : (D)**
6. **Uttiramerur inscriptions in ..... district provide details about Brahmadeya village administration.**
   A) Salem **B)** Kanchipuram
   C) Chennai **D)** Vellore **Ans : (B)**
7. **..... jitals are available for the study of the period of the Delhi Sultans.**
   A) Gold **B)** Silver
   C) Copper **D)** Aluminium **Ans : (C)**

Fill in the blanks :

1. ..... inscriptions provide details about administration in a Brahmadeya village.
   Ans : Uttiramerur
2. ..... had stamped the figure of Goddess Lakshmi on his gold coins and had his name inscribed on it.
   Ans : Muhammad Ghori
3. 3.6 grains of silver amounted to a ..... **Ans : Jital**
4. ..... was patronised by Sultan Nazir-ud-din Mahmud of Slave Dynasty. **Ans : Minhaj-us-Siraj**
5. An Italian traveller ..... visited Vijayanagar Empire in 1420. **Ans : Nicolo Conti**
6. ..... grants, which were treated as legal documents, have significant source value.
   Ans : Copper-plate
7. Palaces in Jaipur, Jaisalmer and Jodhpur signify the greatness of the ..... dynasty. **Ans : Rajput**
8. The ..... period was known as the period of devotional literature in South India. **Ans : Chola**
9. ..... are pictures, images in drawing or painting.
   Ans : Portraits

Match the statement with the reason

1. **Assertion (A)** : Muhammad Ghori's gold coins carried the figure of Goddess Lakshmi.
   Reason (R) : The Turkish invader was liberal in his religious outlook.
   Select the correct answer :
   A) **R** is the correct explanation of **A**
   B) **R** is not the correct explanation of **A**
   C) **A** is wrong and **R** is correct
   D) **A** and **R** are wrong
   Ans : (A)
2. **Statement** : Minhaj-us-Siraj, patronised by Sultan Nazir-ud-din Mahmud, wrote Tabakat-i-Naisiri.
   Reason : The compendium was named after its patron.
   Select the correct answer :
   A) Statement is true but Reason is wrong
   B) Statement and Reason are correct
   C) Statement is wrong and reason is correct
   D) Both statement and reason are wrong
   Ans : (B)
3. **Statement** : According to Ibn Battuta, a Morocco scholar, Egypt was rich in the 16th century.
   Reason : The whole of Indian trade with the west passed through Egypt.
   Select the correct answer :
   A) Statement is true but reason is wrong
   B) Statement and reason are correct
   C) Statement is wrong and reason is correct
   D) Both statement and reason are wrong
   Ans : (C)
4. **Find out the wrong pair**
   A) Madura Vijayam – Gangadevi
   B) Abul Fazal – Ain-i-Akbari
   C) Ibn Battuta – Tahquiq-i-Hind
   D) Amuktamalyatha – Krishnadevaraya
   Ans : (C)
5. **Find out the wrong pair**
   A) Nalayira Divyaprabhandham – 12 Azhwars
   B) Devaram – Appar, Sambandhar, Sundarar
   C) Thiruvasagam – Manikkavasakar
   D) Gita Govindam – Kabiras **Ans : (D)**
6. **Pick out the wrong statement.**
   A) Al-Beruni accompanied Mahmud of Ghazni in one of his campaigns
   B) He stayed in India for 10 years
   C) The most accurate accounts of Mahmud's Somnath expedition is that of Alberuni
   D) He knew only Arabic **Ans : (D)**

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2. **Assertion (A)** : The already existing rivalry among nobles such as Deccanis and Pradesis further intensified.
Reason (R) : Mahmud Gawan curtailed the powers of the provincial chief who were mostly Deccanis.

Select the correct answer :
A) **(R)** is not the correct explanation of **(A)**
B) **(A)** is correct and **(R)** is wrong
C) **(R)** is correct explanation of **(A)**
D) **(A)** and **(R)** are correct

Ans : (C)

3. **Consider the following statement and find out which is/are correct.**
I. Turquoise throne is one of the bejewelled royal seats of Persian kings described in Firdausi's Shah Nama.
II. The fertile regions between the rivers Krishna and Tungabhadra delta were the zones of conflict among the rulers of Vijayanagar and Bahmani.
III. Muhammad I was educated at Multan.
IV. Mahmud Gawan served with great distinction as the Prime Minister under Muhammad III.

Select the correct answer :
A) **I, II** are correct
B) **I, II, III** are correct
C) **II, III, IV** are correct
D) **III, IV** are correct

Ans : (C)

4. **Consider the following statement and find out which is/are correct**
I. The repressive measures of Muhammad-bin-Tughlaq led to the rise of many independent states.
II. Vijayanagara was called Vidyanagara initially.
III. Saluva Narasimha replaced the Saluva dynasty with Aravidu dynasty.
IV. Muhammad Shah I's attack on Warrangal earned him a large property and wealth.

Select the correct answer :
A) **I, II** and **III** are correct
B) **II** and **IV** are correct
C) **I, II** and **IV** are correct
D) **II, III** and **IV** are correct

Ans : (C)

5. **Find out the wrong pair**
A) Silk – China
B) Spices – Arabia
C) Precious stone – Burma
D) Madurai Vijayam – Gangadevi **Ans : (B)**

6. **Find out the wrong pair**
A) Firdausi – Shah Nama
B) Bala Hissar – Golconda Fort
C) Daud – Uncle of Muhammad
D) Zabar Khan – Mahmud Gawan

Ans : (D)

Match the following :

1. **a)** Vijayanagara – **1)** Ruler of Odisha
b) Prataparudra – **2)** Astadiggajas
c) Krishna Devaraya – **3)** Pandurangamahatyam
d) Abdur Razzaq – **4)** City of victory
e) Tenali Ramakrishna – **5)** Persian emissary

Codes :

	a)	b)	c)	d)	e)
A)	4	1	2	5	3
B)	1	2	5	3	4
C)	2	5	3	4	1
D)	5	3	4	1	2

Ans : (A)

2. **a)** Mandapam – **1)** Lord Ranganatha
b) Aravidu dynasty – **2)** Districts
c) Nadus – **3)** Tirumaladeva Raya
d) Andal – **4)** Hampi
e) Virupaksha temple – **5)** Open pavilion

Codes :

	a)	b)	c)	d)	e)
A)	5	3	2	1	4
B)	3	2	1	4	5
C)	2	1	4	5	3
D)	1	4	5	3	2

Ans : (A)

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THE MUGHAL EMPIRE

Introduction

- A new dynasty which transformed India into an empire was Mughals. The foundation was laid by Babur, who had been driven out by his uncles from a kingdom inherited from his father who died when Babur was young. The mughal rule spanned a longer period between 1526 and 1707 except for a brief interval called Suri interrugnum. Six great mughals ruled India in this period. They were, Babur, Humayun, Akbar, Jahangir, Shahjahan and Aurangazeb. Aurangazeb died in 1707 and then the mughal empire disintegrated. Though for namesake, the last mughal ruler was Bahadur Shah II who was extradited to Burma in 1857, after Aurangazeb, they were powerless without much land to rule.

Babur (1526-1530)

- Zahir-ud-din Muhammad Babur, popularly known as Babur, was the founder of the Mughal Empire in India. The term 'Mughal' can be traced to Babur's ancestors. Babur was the great grandson of Timur (on his father's side). On his mother's side, his grandfather was Yunus Khan of Tashkent, who was known as the Great Khan of the Mongols and Babur thirteenth in the direct line of descent of Chengiz Khan. Babur was born on 14 February 1483 in Fergana, which is now in Uzbekistan.
- Though, he faced many hurdles and adversity, Babur had established himself as a ruler of Kabul but motivated by Timur's invasion of India, Babur led expeditions on India. He did not move beyond Punjab till 1524. Then a greater opportunity came knocking. Dilawar Khan, who was Daulat Khan Lodi's son, and Alam Khan, who was the uncle of Sultan of Delhi, arrived in Kabul to seek Babur's help in removing Ibrahim Lodi from power. Babur defeated Ibrahim Lodi in the famous Battle of Panipat in 1526 and occupied Delhi and Agra.

Babur's military conquests

Battle of Kanwa	1527	defeated Rana Sanga
Battle of Chanderi	1528	
Battle of Bengal & Bihar	1529	defeated Afghan chiefs of Bengal and Bihar.

Babur was succeeded by his son Humayun.

Humayun (1530-40 and 1555-1556)

- Babur had four brothers. Each one got one province. Everyone aspired to occupy the throne of Delhi. Hence naturally Humayun had not only fraternal rivals but Afghans under Sher Shah were also a threat. Sher Shah defeated Humayun in the Battle of Chausa in 1539 and at Battle of Kanauj in 1540. Humayun was forced to flee to Iran. After getting the support of Iran king of the Safavid dynasty, he again re-captured Delhi and ruled for only one year and died in 1556, by falling down the staircase of his library.

Sher Shah (1540-45)

- Sher Shah was son of an Afghan noble, Hasan Suri of Sasaram of Bengal. He served in Babur's army. Taking advantage of the weakness of Humayun, he engaged him in battles. Finally Humayun was defeated and Sher Shah started a new dynasty called 'Suri dynasty' for a brief period of 16 years.

Sher Shah's reforms

- Though Sher Shah's rule short lived, the reforms he brought are noteworthy followed even today.
- He set up a strong administrative system.
- Local administrative set up followed by Delhi Sultanates was continued with certain changes.
- The welfare of peasants was his prime concern.
- He ensued that the crops are not destroyed on military marches.
- Land revenue system was organised. Jagirdari and Zamindari systems were introduced.
- He simplified trade practices. Taxes were uniform
- The standardization of coinage system ensured smooth trade practices. His coinage system was a forerunner to the system followed by the British Raj.
- He laid new roads and repaired the existing roads.
- The grand trunk road that runs between Indus in the west to Sonargaon in Bengal was built by Sher Shah.
- Gujarat's sea ports were connected with important cities.
- He built serais, and rest houses along the roads. New towns sprang up near Serais.
- He paid stipends to the needy. His Justice system was uniform. There was no discretion between the Hindus and Muslims.
- Rebellions were put down with heavy hand and punishments. Thus law and order was maintained.
- His land revenue system was followed by Akbar.
- The walled city started by Sher Shah in Delhi came to be later known 'Purana Quila'.
- He built his own mausoleum in 'Sasaram'.
- The weak successors of Sher Shah could rule for only 10 years after his death.

Akbar (1556-1605)

- When Akbar came to the throne after Humayun's death, he was only 14 years old. Humayun's trusted general Bairam Khan was his regent, custodian and mentor. As Akbar's ambitious plan was to bring the

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23. A 1.03 metre Buddha statue in ..... pose in remote Tirunattiyattankudi village.

Ans : Padmasana

24. A ..... in Sanskrit means 'dwelling' or 'house'.

Ans : Vihara

25. The head of Ajivika sect was .....

Ans : Gosala Mankhaliputta

Find out the correct statement :

1. **Assertion (A)** : Gautama found that he had nothing to learn from the teachers of the old religions.
   Reason (R) : The religions proclaimed that the only way to salvation was through living the life of an ascetic.
   Select the correct answer :
   A) **(A)** is correct, **(R)** is the correct explanation of **(A)**
   B) **(A)** is correct, **(R)** is not the correct explanation of **(A)**
   C) Both **(A)** and **(R)** are wrong
   D) **(A)** is wrong but **(R)** is correct
   Ans : (A)

2. **Assertion (A)** : A major split occurred in Jainism in the 1st century B.C. into two sects.
   Reason (R) : Both the sects a acknowledge the Agama Sutras to be their early literature, but differed with their content and interpretation.
   Select the correct answer :
   A) **(A)** is correct, **(R)** is not the correct explanation of **(A)**
   B) **(A)** is correct, **(R)** is the correct explanation of **(A)**
   C) **(A)** is correct, **(R)** is the correct explanation of **(A)**
   D) Both **(A)** and **(R)** are wrong
   Ans : (B)

3. **Find out the correct statement/s**
   I. During the 6th century B.C. as many as 62 religious schools flourished in India.
   II. 'Palli' is an educational centre of Buddhists.
   III. Royal patronage allowed pre-Muslim India to become a land of viharas.
   IV. The Ajivikas continued to exist till 15th century.
   Select the correct answer :
   A) **(I)** and **(III)** are correct
   B) **(I)**, **(II)** and **(IV)** are correct
   C) **(I)** and **(II)** are correct
   D) **(II)**, **(III)** and **(II)** are correct
   Ans : (A)

4. **Find out the correct statements**
   I. The 12th Agama Sutra is said to have been lost.
   II. Naladiyar is attributed to a Buddhist monk.
   III. Vajrabodhi was a Buddhist monk skilled in tantric rituals.
   IV. Emperor Asoka and his grandson Dasaratha patronised Jainism.
   Select the correct answer :
   A) **(I)** and **(II)** are correct
   B) **(II)** and **(III)** are correct
   C) **(I)** and **(III)** are correct
   D) **(I)**, **(II)** and **(IV)** are correct
   Ans : (C)

5. **Find out the wrong pair/s**
   A) Parshvanatha – 22nd Tirthankara
   B) Mahabashya – The Ceylonese Chroniclei
   C) Visuddhimagga – Buddhagosha
   D) Buddha – Eight-fold Path
   Ans : (A)

6. **Find out the wrong pair/s**
   A) Irugappa – Pushpasena
   B) Thevaram – Azhwars
   C) Nalayira Divyaprabandam – Saiva saints
   D) Buddhacharita – Asvaghosa
   Ans : (B)

Match the following :

1. **a)** Kalpa Sutra – **1)** Tiruthakkathevar
   b) Jivaka Chintamani – **2)** Madurai
   c) Neminatha – **3)** Nagasena
   d) Milinda Panha – **4)** Bhadrabahu
   e) Kizha Kuyil Kudi – **5)** 22nd Tiruthankara
   Codes :

	a)	b)	c)	d)	e)
A)	4	1	5	3	2
B)	1	5	3	2	4
C)	5	3	2	4	1
D)	3	2	4	1	5

Ans : (A)

2. **a)** Maha Bhasya – **1)** instructions manuals
   b) Angas – **2)** rules of conduct for the monks
   c) Upangas – **3)** great commentary
   d) Chedas – **4)** basic doctrine of Jainism
   e) Mulas – **5)** scriptures for Swetambaras
   Codes :

	a)	b)	c)	d)	e)
A)	3	5	1	2	4
B)	5	1	2	4	3
C)	1	2	4	3	5
D)	2	4	3	5	1

Ans : (A)

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GEOGRAPHY

INTERIOR OF THE EARTH

Introduction

- Human life is largely influenced by the physiography of the region. Therefore, it is necessary to get acquainted with the forces that influence landscape's development. The earth's radius is about 6,371 km. No one can reach the centre of the earth and make observations or collect samples of the material. The rapid increase in temperature below the earth's surface is acting as deterrent to observe inside the earth.
- Seismic activity is one of the most important sources of information about the interior of the earth. The study of seismic waves provides a complete picture of the earth's layered interior.

Structure of the Earth

Based on the evidences acquired by investigating earthquake waves, the spherical earth can be divided into three concentric layers. They are : (1) The Crust, (2) The Mantle, (3) The Core.

1. The Crust

- It is the outermost solid part of the earth and brittle in nature. **The average thickness of the crust varies from 5 to 35 km.** Oceanic Crust is thinner as compared to the continental crust. The mean thickness of oceanic crust is 5 km whereas that of the continental is around 35 km. The Continental Crust is thicker in the areas of major mountain systems. It is as much as 70 km thick in the Himalayan region.
- Despite greater thickness, the continental crust is less dense than the oceanic crust because it is made of both light and dense rock types. The oceanic crust is composed mostly of dense rocks such as basalt.
- The crust comprises of two distinct parts. The upper part consists of granite rocks and forms the continents. It has the main mineral constituents of **silica and alumina.** So it is collectively referred to as **Sial.** It has an average density of **2.7g/cm^3.**
- The lower part is a continuous zone of denser basaltic rocks forming the ocean floors, comprising mainly of **silica and magnesium.** It is therefore called Sima. It has an average density of **3.0g/cm^3**. The sial and the sima together form the earth's crust. Since the sial is lighter than the sima, the continents can be said to be **'floating'** on a sea of denser sima.

Earth is called as Blue Planet because 71% of the surface of the earth is covered by water.

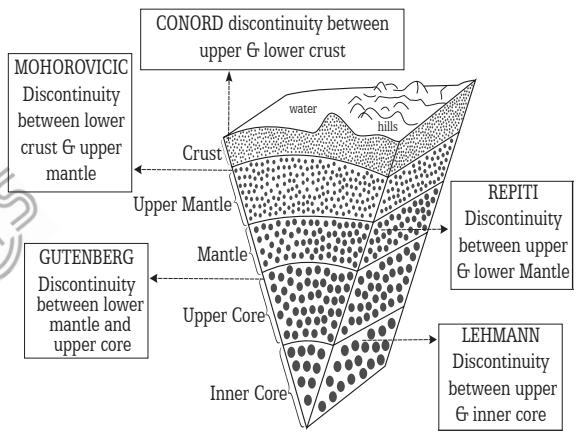
2. The Mantle

- The interior portion, beyond the crust is called the **Mantle**.
- It is separated from the crust by a boundary called **Mohorovicic discontinuity.** The mantle is about 2,900km thick. It is divided into two parts. (i) The upper mantle with a density of 3.4 - 4.4g/cm^3 extends down to 700 km. (ii) The lower mantle having a density of 4.4 - 5.5g/cm^3 extends from 700 to 2,900km.
- **The upper portion of the mantle is called asthenosphere.** The word astheno means weak. It is the main source of magma that finds its way to the surface during volcanic eruptions. The lower mantle extends beyond the asthenosphere which is in solid state.

3. The Core

- Core is the innermost layer and has the highest density.
- **It is also known as barysphere.** It is separated from the mantle by a boundary called Weichart-Gutenberg discontinuity. The core is also divided into two parts. (i) The outer core, which is rich in iron, is in liquid state. It extends between 2,900 – 5,150 km. (ii) The inner core, composed of **Nickel and Ferrous (Nife),** is solid in state. The central core has very high temperature and pressure. It extends from 5,150 km to 6,370 km. The average density of core is **13.0 g/cm^3.**

- The crust forms only 1 per cent of the volume of the earth, 84 % consists of the mantle and 15 % makes the core.
- The radius of the earth is 6371 km.



Interior of the Earth

Earth Movements

- The lithosphere is broken into a number of plates known as the **'Lithospheric plates'**. It is interesting to know that these plates move around very slowly – Just a few millimeters each year. These plates (oceanic (or) continental) moves independently over

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nature, utility, time and distance as indicated below : Religious tourism, Cultural tourism, Historical tourism, Eco-Tourism, Adventure tourism, Recreational tourism

Religious Tourism

Religious tourism is one of the oldest type of tourism, wherein people travel individually or in groups for pilgrimage to a religious location such as temples, churches, mosques and other religious places. Religious tour to Kasi (Varanasi) by Hindus, to Jerusalem by Christians and to Mecca by Muslims are few of the examples for religious tourism.

Historical Tourism

It focuses on visiting historically important places like museums, monuments, archaeological areas, forts, temples and so on. Angkorwat of Cambodia, Tajmahal of India and Pyramids of Egypt are some of the examples to quote for Historical Tourism.

Eco-Tourism

Eco tourism typically involves travel to destinations where plants and animals thrive in a naturally preserved environment. Amazon rain-forest, African forest safari, trekking in the slopes of Himalayas are the famous Eco friendly attractions.

Gastronomy refers to an aspect of cultural tourism.

Adventure Tourism

Adventure tourism is a type of tourism involving travel to remote or exotic places in order to take part in physically challenging outdoor activities. For example sky dive in Australia, Bungee jumping in New Zealand, mountaineering in the peaks of Himalayas, rafting in the Brahmaputra River at Arunachala Pradesh.

Recreational Tourism

This type of tourism aims at enjoyment, amusement or pleasure are mainly for 'fun activity'. Waterfalls, hill stations, beaches, and amusement parks are the attractive spots for recreational tourism.

Apart from this, there are certain modern types of tourism, which got developed in recent years. They are: Annual Holiday tourism, Industrial Tourism, Seasonal Tourism, International Tourism, Group Tourism, Sports Tourism, Health Tourism, Farm and Rural Tourism.

Inbound Tourism : Touring within the native country.
Outbound Tourism : Touring in foreign countries

- **VISA** – A document issued to a person (or) a stamp marked on the passport of a person who wants to visit other country.
- **Tourist VISA** – Recreation sight seeing
- **Student VISA** – Higher education
- **Employment VISA** – Work in a country
- **Medical VISA** – Medical treatment in a reputed hospital of a country.

International Tourism

International tourism is undertaken to visit the places of international importance and to gather knowledge about international culture and customs. For this, there are certain travel forms and formalities to be fulfilled by the tourists, such as passport, Visa, Foreign Currency, Air ticket, Travel insurance, and other immigration details.

Basic Elements of Tourism attractions

Certain elements are fundamental to attract tourists as travel destinations. They are

- Pleasant weather
- Scenic beauty
- Historical and cultural monuments

Geographical Components of Tourism

- **Landforms :** Mountains, Plateaus, Canyons, Valleys, Caves, Cirques, Sand dunes, Coral reefs, Cliffs, etc.,
- **Water :** Rivers, Lakes, Waterfalls, Hot springs and Geysers, Snow and Glacier, Water Currents, Tides and Waves.
- **Vegetation :** Forest, Grasslands, Moors, Deserts etc.,
- **Climate :** Sunshine, Clouds, Admirable Temperature, Rain and Snow.
- **Animal life : (a)** Wildlife : Birds, Game Reserves, Zoos, **(b)** Hunting and Fishing
- **Settlement features : (a)** Towns, Cities, Villages, **(b)** Historical remains and Monuments.
- **Culture :** Ways of life, traditions, folklore, arts and crafts.

Game Reserves : An area of land set aside for the protection of wild animals.

Tourism Attractions in India

India is a country known for its gentle hospitality with spicy food and culture. Visitor friendly traditions with varied life style, culture, heritage, colourful fairs and festivals are abiding attractions for the tourists. All types of land form, varied climate, rich resources for eco and adventure tourism are the versatile speciality of India. Technological parks and science museums, pilgrimage centers with wonderful art and architecture are an added advantage for tourists. Yoga, Ayurveda and Natural remedial Health resorts attract tourists from all over the world.

Religious Tourism

India being a multi-religious country, religious tourism is the most popular type of tourism. Various package tours are organized for the people to attend the religious rituals and to visit places of religious importance. Most famous religious spots of India are as follows :

Rameswaram	Tamil Nadu
Kanchipuram	Tamil Nadu
Varanasi(Kasi)	Uttarpradesh
Saranath	Uttarpradesh
Vaishnavadevi temple	Jammu & Kashmir (U.T)
St. Francis Xavier Cathedral	Goa
Amritsar	Punjab
Monasteries of Ladakh	Ladakh (U.T)

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Scenic attraction is a very important factor in tourism. Scenery consisting of Mountains, Lakes, Waterfall, Glacier, Forests, and Deserts are the major features attracting people to visit them. India is blessed with nature and gifted with immense beauty from rolling hills to deep valley and snow covered mountains to lush green carpet.

Hill Stations in India

The Indian sub continent has seven principal mountains ranges and the largest of all is the Himalayas that lie in the northern part of India. Most of the Himalayan hill stations in India are located in states of Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, West Bengal, Arunachal Pradesh, Nagaland and Meghalaya. Maharashtra, Karnataka, Tamil Nadu and Kerala have hill stations in the Western Ghats. Andhra Pradesh, Odisha have hill stations in the Eastern Ghats.

The beautiful hill stations in India

Kodaikanal, Ooty	Tamil Nadu
Nainital, Mussoorie	Uttarakhand
Darjeeling	West Bengal
Gulmarg	Jammu & Kashmir
Shillong	Meghalaya
Shimla, Manali	Himachal Pradesh
Munnar	Kerala
Gangtok	Sikkim

ITC – Inclusive Tour Charter
IATA – International Air Transport Association
IATO – Indian Association of Tour Operators
TAAI – Travel Agents Association of India
TTTHA – Tamil Nadu Tour Travel and Hospitality Association
TTDC – Tamil Nadu Tourism Development Corporation

Water falls in India

In India there are many spectacular and wonderful waterfalls covered by dense forest, huge walls of rock and lush green trees. Among these waterfalls, some are seasonal, while some are perennial. Few of the amazing waterfalls are in full swing during the monsoon season. This season brings lot of tourists to these bubbling waterfall sites. Notable waterfalls of India are :

Water falls	Geographical location
Thalaiyar waterfalls	Horse tail type, located in Dindugul district of Tamil Nadu
Jog water falls	Segmented waterfall (Raja, Rani and thunder) located in Shimogo district of Karnataka.
Nohkalikai waterfalls	Tallest plunge type of waterfall situated in the East Khasi hill district of Meghalaya.
Talakona waterfalls	It is the highest waterfall in Andhra Pradesh. A lot of medicinal herbs are seen around the region.
Aathirappally waterfalls	The Niagara of India, is located in Thrissur district of Kerala.

Wild life and Bird Sanctuaries

India possesses a wide range of forests and grasslands. Diversity of these lands makes it one of the hotspot for flora and fauna. The dense and dark forest of Indian States provides suitable habitat for a wide and an unique variety of animals and birds. Royal Bengal Tigers, Indian Lions, Elephants, Rhinoceros, Indian leopard and Reptiles are the major tourist attractions. Bird sanctuaries attract attention for their exclusive variety of birds. Diverse climate of India acts as conducive for birds from remote places to feed, breed and to nurture their young ones in the Indian bird sanctuaries.

- Push factors in Tourism are Prestige
- Pull factors in Tourism are Amenities.

Some Important Wildlife Sanctuaries in India

Wildlife Sanctuary	State	Animals
Mudumalai wildlife sanctuary	Tamil Nadu	Tiger, Elephant, Bison, Deer
Kaziranga National Park	Assam	Tiger, Deer, Buffalo
Ranthambor National Park	Rajasthan	Tiger
Kanha National Park	Madhya Pradesh	Swamp Deer
Sundarbans National Park	West Bengal	Bengal Tiger
Gir National Park	Gujarat	Lions
Bhadra Wildlife Sanctuary	Karnataka	Bison, Leopard, Gaur
Periyar National Park	Kerala	Elephant, Deer
Corbett National Park	Uttarakhand	Tiger

Bird Sanctuaries in India

No	Bird Sanctuary	State
1.	Koonthankulam bird sanctuary	Tamil Nadu
2.	Kumarakom bird sanctuary	Kerala
3.	Bharatpur bird sanctuary	Rajasthan
4.	Mayani bird sanctuary	Maharashtra
5.	Uppalapadu bird sanctuary	Andhra Pradesh
6.	Nal Sarovar bird sanctuary	Gujarat
7.	Nawabganj bird sanctuary	Uttar Pradesh

Beaches

India is a country with 7517 km long coastline comprising the most beautiful beaches bounded by Arabian sea and Bay of Bengal. Indian beaches are enriched with diverse coastal land forms filled with aquatic flora and fauna . Lush backwater in the lagoons of

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NATURAL HAZARDS – UNDERSTANDING OF DISASTER MANAGEMENT IN PRACTICE

Hazard

A hazard is a source or situation with the potential to harm or likely create human injury or ill-health, damage to property, damage to the environment, or a combination of these. **Natural Hazards** are elements of circumstances in the natural environment that have the potential to cause harm to people or property to both. Natural Hazards can be classified into two broad categories : **Geophysical and biological.**

Disaster

A disaster can be generally defined as "A serious disruption in the society causing widespread material, economic, social or environmental losses which exceed the ability of the affected society to cope using its own resources". Impact of Disaster may include loss of life, injury, disease and other negative effects on human physical, mental and social well-being, together with damage to property, destruction of assets, loss of services, social and economic disruption and environmental degradation. Hazards are termed as Disasters when they cause widespread destruction of property and human lives.

Example : Hurricane is a natural hazard. It develops at sea. When it reaches land and destroys buildings and kill people, it can be described as a disaster.

Types of Disasters

Types of Disaster	Sources	Events
Natural Disaster	Beneath the Earth Surface	Earthquakes, tsunamis and volcanic eruptions
	On the Earth Surface	Landslides and Avalanches
	Meteorological / Hydrological	Windstorms, Tornadoes, Hailstorms and Floods.
	Health	Epidemics
Man-made Disaster	Socio - technical	Technological, Transportations disasters, Structural collapse and production failures.
	Warfare	National and International

Natural Disasters

Earthquake : Earthquakes are by far the most unpredictable and highly destructive of all kind of the natural disasters. A sudden movement (or) trembling of the earth crust is called as earthquake. The movement of the tectonic plates, mass wasting, landslides, surface fault, etc., causes earthquake.

Effects : When a strong earthquake hit, the loss of lives, damages to properties are unimaginable. Earthquakes can cause floods, tsunamis, landslides, fires, breakdown of water supply and electrical lines. Sometimes river channels are blocked or their courses are changed due to the impact of earthquake.

Recent Hazards in India and Tamil Nadu

On 2nd to 3rd May 2018 a high velocity dust storms swept across the parts of North India and more than 125 people died and over 200 were injured. In Agra, Uttar Pradesh 43 people died and about 30 died in other parts of the state. In Rajasthan state 35 people died and over 200 were injured. The wind downed more than 8000 electricity posts and uprooted hundreds of trees.

After 2004 tsunami, cyclone Gaja was the worst natural disaster to hit Tamilnadu. It left a trail of destruction in several coastal districts and took a toll on agriculture to a serious extent.

Tsunami

- Earthquakes and volcanic eruptions that cause the sea-floor to move abruptly, resulting in a sudden displacement of ocean water in the form of high vertical waves are called **tsunamis** (harbour waves).
- **Effects :** The sea waves rise to several meters and wreaks havoc on settlement in the coastal areas.
- **Example :** Tsunami that occurred on 26-12-2004 near the coast of Sumatra, Indonesia damaged the properties worth billions of rupees. It is estimated that more than two lakh people lost their lives in Southeast Asia, India and Srilanka.

The word "Tsunami" is derived from the Japanese word. "Tsu" means harbour and "nami" means waves.

Flood

- The inundation of an area by water is called a flood. In other words, when a river over flows its banks and water spreads in the surrounding areas is a flood. Other causes of flood are heavy rainfall, cyclone, melting of snow, dam burst, etc..
- **Effects :** Loss of life and property, Displacement of people, Spread of contagious diseases such as Cholera and Malaria etc.,

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Cyclone

- Cyclones are centres of low atmospheric pressure, in which the air pressure increases from the centre to the outer areas. Consequently, winds flow from outside to the centres.
- **Effects of Cyclone :** The main effects of tropical cyclone include heavy rain, strong wind, large storm surges near landfall and tornadoes.
- "Severe cyclonic storm Gaja crossed the coasts of Tamilnadu and Puducherry around Vedaranyam and Nagapattinam in the early hours of November 10, 2018 with wind speed gusting around 120 (Kmph)" reported the Indian Meteorological Department.

Man Made Disasters

Stampede

- Stampede can be defined as "an occasion when large number of people suddenly move in an uncontrolled way, usually in the same direction at the same time, especially out of fear". Stampede can be prevented by various crowd management strategies.

Fire

- Fire is a disaster caused due to electrical short circuit, accidents in chemical factory, match and crackers factory.
- Fire involves 3 basic aspects
  1. Prevention
  2. Detection
  3. Extinguishing
- Public awareness of what to do before fire, during fire and after fire is of critical importance.

Industrial Disaster

- Industry faces multiple risks involved with its production, transportation, storage, usage and disposal of the effluents containing residuals and hazardous materials from nuclear and chemical industries.

  Example : Bhopal gas leakage

Riot

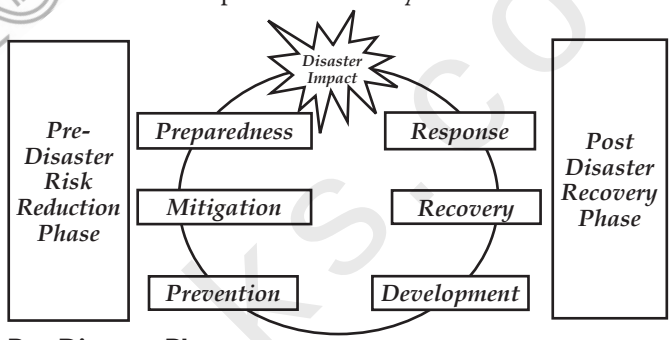
- Thousands of people are killed in riots all over the world each year, and these riots erupt from a number of racial, religious, economic, political, or social causes that cannot be predetermined. As per Pew Research Center analysis of 198 countries on April 11, 2015. Syria tops in riot in the world followed by Nigeria, Iraq and India.

Disaster Management

- The systematic process of applying administrative directives, organizations, and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster is called Disaster Management.
- Disaster Management is necessary or expedient for :
  - Prevention
  - Mitigation
  - Preparedness
  - Response
  - Recovery
  - Rehabilitation

Disaster Management Cycle or Disaster Cycle

The six disaster management phases that have been used in the concept of disaster cycle are as follows :



Pre-Disaster Phase

Prevention and Mitigation

- Reducing the risk of disasters involves activities, which either reduce or modify the scale and intensity of the threat faced or by improving the conditions of elements at risk. The use of the term reduction is to describe protective or preventive actions that are likely to lessen the scale of impact. Mitigation embraces all measures taken to reduce both the effects of the hazard itself and the vulnerable conditions to it, in order to reduce the scale of a future disaster.
- In addition to these physical measures, mitigation should also be aimed at reducing the physical, economic and social vulnerability threats and the underlying causes for the vulnerability. Therefore, mitigation may incorporate addressing issues such as land ownership, tenancy rights, wealth distribution, implementation of earthquake resistant building codes etc.

Preparedness

- The process includes various measures that enable governments, communities and individuals to respond rapidly to disaster situations to cope with them effectively. Preparedness includes for example, the formulation of viable emergency plans, the development of warning systems, the maintenance of inventories, public awareness and education and the training of personnel. It may also embrace search and rescue measures as well as evacuation plans for areas that may be "at risk" from a recurring disaster. All preparedness and planning needs to be supported by appropriate rules and regulations with clear allocation of responsibilities and budgetary provision.

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Traffic Signals

- Red-stop, Amber (yellow) get ready or cross carefully. Green-the way clear signal. Arrows in the green indicate the ways you can go. Flashing red light cautions to proceed only when the way is clear. Flashing yellow signal indicates to slow down and proceed with caution.

Traffic Rules in India

- The Motor Vehicles Act 1988 passed by the Parliament came into force in 1989.

304 A of the Indian Penal Code

The police will file a criminal case under this section, which deals with offences relating to death due to rashness and negligence of the driver.

Different Colour Number Plates	
Red Number Plate	It is used in the vehicle for the President of India and Governor of States.
Blue Number Plate	It is given to a vehicle that is used by foreign delegates/ambassadors.
White Number Plate	It means that the car belongs to a common citizen.
Yellow Number Plate	It is for commercial vehicle.

- Many safety measures have taken to ensure accident free driving. Pilot projects for Cashless Treatment of Road Accident victims have been taken up in the stretch of NH8 and NH33. It will be extended to golden quadrilateral roads. Now, quick ambulance service is available every 50 kms on National Highways. 24×7 Ambulance service is available.

Setu Bharatam - a program was launched in 2016 for building bridges for safe and seamless travel on National Highways. It aims to make all National Highways free of railway level crossing by 2019.

- Nowadays variable message signs have been put up in many places. The Second Global High Level Conference on Road Safety co-sponsored by WHO took place in Brasilia, Brazil in 2015 (Nov. 18-19). India was signatory to Brasilia Declaration. The Government of India has released a set of comic books on road-safety called 'Swachha Safer' and 'Suvarshit Yatra' to educate children on road safety.
- Road safety weeks are regularly celebrated to reinforce road safety behaviour among road users. They are organised regularly by National Safety Council of India (NSC). It is an autonomous body.
- The 2011-2020 decade has been declared as 'Decade of Action for Road Safety' by UNO, to improve road safety, to enhance the behaviour of road users and to improve emergency services. The motto is "Together we can save millions of lives".

Save LIFE Foundation is an independent, non-profit, non-governmental and public charitable trust that is working to improve road safety and emergency medical care across India.

The international Federation of Red Cross and Red Crescent Societies (IFRC)

Suggested 10 points as follows :

1. Know how to react in case of a crash
2. Use a seatbelt
3. Wear a helmet on a motor-cycle
4. Drive at a safe speed and distance suitable for the conditions
5. Not drive under the influence of alcohol or drugs
6. Not use a mobile phone while driving
7. Be visible as a pedestrian or cyclist
8. Know and respect the highway code
9. Maintain my vehicle in a good condition
10. Be licensed and trained for the vehicle I drive

1. Rules of Road Regulations – 1989
2. The Central Motor Vehicle Rules – 1989
3. The Motor Vehicle Act – 1968

Ten Golden Rules of Road Safety

- **STOP OR SLOW DOWN :** Allow Pedestrians to cross first at uncontrolled zebra crossing. They have the Right of Way (Rule 11).
- **BUCKLE UP :** So that your family and you are safe in the car (Section 138 (3). Seat Belts reduce chances of death of a car occupant in accident by over 60%.
- **OBEY TRAFFIC RULES AND SIGNS :** To prevent road accidents (Section 119).
- **OBEY SPEED LIMITS :** For your own safety and for others (Section 112). In residential area and market places, that ideal speed is 20 kmph or the limit is 30 kmph.
- **KEEP VEHICLE FIT :** To prevent frequent breakdowns and difficulty in controlling vehicle which may lead to accidents on road (Section 190).
- **NEVER USE MOBILE WHILE DRIVING :** To avoid distraction that lead to accidents (Section 184).
- **WEAR HELMET :** To protect your head while riding a two wheeler (Section 129). A good quality helmet reduces the chances of severe head injury by over 70%.
- **NEVER DRIVE DANGEROUSLY :** To ensure your own safety and that of other road user (Section 184).
- **BE COURTEOUS :** Share the road with all and be considerate. Never race on the road. It is dangerous for you and other road users.
- **NEVER MIX DRINKING AND DRIVING :** Be Responsible. Don't drink and Drive (Section 185).

An individual must have undergone proper training, must possess driving license, registration certificate of the vehicle, insurance certificate, taxation certificate, fitness certificate and permit. The vehicle must be in

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good condition. Brake should be checked immediately after you move the vehicle. One must opt for use of Raksha safe drive device. It is attached with velcro to the car to alert the driver on humps, bad roads and on crossing speed limits.

Parents and Teachers must educate the children about road safety.

Raksha safe drive : It is a device capable of automatic crash detection, two – way call connectivity, GPS tracking, engine health monitoring and smart panic button.

Carpooling is the sharing of car journeys so that more than one person travels in car, and prevents the need for more cars to the same location.

★ Objective Type Questions with Answers ★

Choose the correct answer :

1. **At a red light**
   A) You can keep going if the path looks clear
   B) You must stop and wait for it turn green
   C) Quickly you can reply your friend's text message
   D) You can attend call **Ans : (B)**

2. **Pedestrians can cross the road only .....**
   A) at anywhere **B)** near the signals
   C) at zebra crossing **D)** none **Ans : (C)**

3. **Road Safety Week is celebrated in the month of ..... every year.**
   A) December **B)** January
   C) March **D)** May
   Ans : (B)

4. **For emergency, call ..... for ambulance service.**
   A) 108 **B)** 100
   C) 106 **D)** 101 **Ans : (A)**

5. **What are the causes for the road accidents ?**
   A) Over Speeding
   B) Drunken Driving
   C) Distraction to Drivers
   D) All of these **Ans : (D)**

6. **The first category of traffic signs is .....**
   A) Mandatory Signs
   B) Cautionary Signs
   C) Informatory Signs
   D) None of these **Ans : (A)**

7. **'Setu Bharatam', a program was launched in .....**
   A) 2014 **B)** 2015
   C) 2016 **D)** 2017 **Ans : (C)**

8. **Expand ABS :**
   A) Anti Brake Start
   B) Annual Base System
   C) Anti-locking Brake System
   D) None of these **Ans : (C)**

9. **Overtaking when approaching a bend is**
   A) permissible
   B) not permissible
   C) permissible with care
   D) our wish **Ans : (B)**

10. **When the ambulance is approaching**
    A) allow passage if there are no vehicles from front side
    B) no preference need be given
    C) allow free passage by drawing to the side of the road
    D) drive behind the ambulance with great speed
    Ans : (C)

11. **The Ministry of Road Transport and Highways has taken a number of steps to prevent .....**
    A) Road Safety **B)** Road Accident
    C) Improper Lights **D)** None of these **Ans : (B)**

12. **At a green light**
    A) You can keep going if the path looks clear
    B) You must stop and wait for it turn green
    C) Quickly you can reply your friends text message
    D) You can attend call immediately
    Ans : (A)

13. **..... can cross the road only at Zebra crossing.**
    A) Animals **B)** Birds
    C) Pedestrians **D)** All of these **Ans : (C)**

14. **..... week is celebrated in the month of January every year.**
    A) Road safety **B)** Railway safety
    C) Air safety **D)** Water safety **Ans : (A)**

15. **Road safety is ..... meant about the protection and security of all road users.**
    A) Primary **B)** Secondary
    C) Tertiary **D)** All of these **Ans : (A)**

16. **The rule of the road regulation was brought into effect from 1st July .....**
    A) 1999 **B)** 1989
    C) 1979 **D)** 1990 **Ans : (B)**

17. **..... program was launched in 2016.**
    A) Mandatory Signs **B)** Setu Bharatam
    C) Agricultural **D)** Safety rules **Ans : (B)**

18. **Example for weather condition.**
    A) Fog **B)** Snow
    C) Heavy Rainfall **D)** All of these **Ans : (D)**

19. **The main motive behind ..... is saving time.**
    A) Red Light Jumping **B)** Drunken Driving
    C) Over Speeding **D)** None of these **Ans : (A)**

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tax. For example, if you get a bill for the products you buy, you will find the following information:

Value of the Product = ₹ 100
SGST 9% = ₹ 9
CGST 9% = ₹ 9
Total = ₹ 118

- In the bill, the GST is 18%, and it is divided equally as 9% for the Central and State Governments. Therefore, ₹ 9 will go to State Government and another ₹ 9 will go to Central government.
- If a seller in Tamil Nadu sells a commodity to a buyer in other state (for example Karnataka), it is called inter-state trade. In the case of inter-state trade, the bill will be as given below:

Value of the Product = ₹ 100
IGST 18 % = ₹ 18
Total = ₹ 118

- ₹ 18 will go to Central government. Central government will take ₹ 9 and send another ₹ 9 to Karnataka government.

Toll Tax & Road Tax : Toll tax is a tax that we often pay to use any form of infrastructure developed by the government, example roads and bridges. The tax amount levied is rather negligible which is used for maintenance and basic upkeep of a particular project.

Swachh Bharat Cess : This is a cess imposed by the government of India and was started from 15 November 2015. This tax is applicable on all taxable services and the cess currently stands at 0.5%. Swachh Bharat cess is levied over and above the 14% service tax that is prevalent in the present.

- GST is divided into five slabs - 0 per cent, 5 per cent, 12 per cent, 18 per cent, and 28 per cent. Although GST is collected by the central government, taxes on petroleum products, alcoholic drinks, electricity are separately collected by the state government and almost all the necessities of life, like vegetables and food grains are exempted from this tax.

Distinction between Direct and Indirect Tax

Direct Tax	Indirect Tax
Burden cannot be shifted by taxpayers	Easily be shifted to another person
Tax is imposed on personal income and corporate income	Taxes imposed on various goods and services
Direct tax has no inflation pressure	This tax has inflation pressure
The impact and incidence are the same in case of direct tax	The impact and incidence are different in case of indirect tax.
Direct tax is less elastic	Indirect tax is more elastic

Taxes and Welfare

- Increasing the revenue of the government remains the most important function of taxes, which serve as the primary means for financing public goods such as maintenance of law and order and public infrastructure, etc. Government's ability to raise taxes is called its fiscal capacity.
- When expenditure exceed tax revenue, a government accumulates debts (fiscal deficit). Some portion of taxes can be used to serve past debts. Other important reason to levy tax is to bring equality among people. (Rich people taxed more to bring parity among different classes of people). Government use taxes as an instrument to subsidize industries, providing social benefits, and to fund infrastructure.

★ Objective Type Questions with Answers ★

Choose the correct answer :

1. **Taxes are ..... payment.**
   A) Voluntary **B)** Compulsory
   C) A and B **D)** None of the above
   Ans : (B)

2. **Minimum possible amount should be spent in the collection of taxes is**
   A) canon of equality
   B) canon of certainity
   C) canon of economy
   D) canon of convenience
   Ans : (C)

3. **This taxation is opposite to progressive taxation.**
   A) degressive **B)** proportional
   C) regressive **D)** none
   Ans : (C)

4. **Income tax is a**
   A) direct tax **B)** indirect tax
   C) A & B **D)** degressive tax
   Ans : (A)

5. **Which tax is raised on provision of service ?**
   A) wealth **B)** corporate
   C) estate **D)** service
   Ans : (D)

6. **Which one of the following is not a indirect Tax ?**
   A) Service tax
   B) Value Added Tax (VAT)
   C) Estate duty
   D) None of the above **Ans : (C)**

7. **Which one of the following tax is a direct tax ?**
   A) Service tax **B)** Wealth tax
   C) Sales tax **D)** Progressive tax
   Ans : (B)

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8. **..... is a method by which the rate of tax will also increase with the increase of income.**
   A) Proportional Taxation
   B) Progressive Taxation
   C) Regressive Taxation
   D) Digressive Taxes
   Ans : (B)

9. **Wealth tax is an example of .....**
   A) direct tax **B)** indirect tax
   C) **(A)** and **(B)** **D)** none
   Ans : (A)

10. **..... is charged from successor of inherited property.**
    A) Wealth Tax **B)** Gift Tax
    C) Estate Duty **D)** Service Tax
    Ans : (C)

11. **..... is paid by the producer of goods who recovers it from wholesalers and retailers.**
    A) Wealth Tax **B)** Gift Tax
    C) Estate Duty **D)** Excise Duty
    Ans : (D)

12. **Swachh Bharat Cess was started from .....**
    A) 15 November 2015
    B) 20 November 2015
    C) 10 November 2016
    D) 10 November 2017
    Ans : (A)

Fill in the blanks :

1. ..... is a term for when a taxing authority usually a government levies or imposes a tax.
   Ans : Taxation

2. ..... is the method, where the rate of tax is same regardless size of the income.
   Ans : Proportional Taxation

3. ..... is paid to the Government by the recipient of gift depending on value of gift.
   Ans : Gift Tax

4. ..... tax burden cannot be shifted by tax payers.
   Ans : Direct

5. Indirect tax is ..... elastic.
   Ans : more

6. ..... principles or cannons of taxation still form the basis of the tax structure of a modern state.
   Ans : Adam Smith's

7. ..... could be one of the most deserving recipients of tax money.
   Ans : Education

8. ..... is a crucial component in the smooth running of country affairs.
   Ans : Governance

9. Taxes generally contribute to the ..... of a country.
   Ans : gross domestic product

10. ..... constituted under the Central Board of Revenue Act, 1963.
    Ans : Central Board of Direct Taxes

11. ..... is particularly designed to replace the indirect taxes imposed on goods and services by the Central and State.
    Ans : GST

Match the following :

1. **a)** Principle of taxation – **1)** Direct Tax
   b) Estate tax – **2)** Goods and Services Tax
   c) Excise Tax – **3)** Adam Smith
   d) 01.07.2017 – **4)** Less elastic
   e) Direct Tax – **5)** Indirect Tax

   Codes :

	a)	b)	c)	d)	e)
A)	3	1	5	2	4
B)	1	5	2	4	3
C)	5	2	4	3	1
D)	2	4	3	1	5

   Ans : (A)

2. **a)** Proportional Taxation – **1)** Transparent tax
   b) Entertainment – **2)** Roads and bridges
   c) GST – **3)** Royalties
   d) Toll tax – **4)** Size of the income
   e) Corporation tax – **5)** Movie tickets

   Codes :

	a)	b)	c)	d)	e)
A)	4	5	1	2	3
B)	5	1	2	3	4
C)	1	2	3	4	5
D)	2	3	4	5	1

   Ans : (A)

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8th Standard

SOCIAL SCIENCE

HISTORY

- Advent of Europeans
- From trade to territory
- Rural life and Society
- People's Revolt
- Educational Development in India
- Development of Industries in India
- Urban changes during the British period
- Status of Women in India through the ages

GEOGRAPHY

- Rocks and Soils
- Weather and Climate
- Hydrologic Cycle
- Migration and Urbanisation
- Hazards
- Industries
- Exploring Continents (Africa, Australia and Antarctica)
- Map Reading

CIVICS

- How the State Government Works ?
- Citizen and Citizenship
- Understanding Secularism
- Human Rights and UNO
- Road Safety Rules and Regulations
- Defence & Foreign Policy
- The Judiciary

ECONOMICS

- Money, Saving and Investments
- Public and Private Sectors

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HISTORY

ADVENT OF EUROPEANS

- The accounts left by visitors, missionaries, civil servants and traders are the main sources to know the modern history of India pertaining to the periods of 18th & 19th centuries.
- From the very beginning, the Portuguese, the Dutch, the French, the Danes, and the English recorded their official transactions in India on state papers.
- They are the authentic source to understand the politico-socio-economic developments during that period.
- The archives at Chennai, Puducherry, Goa and Lisbon (Portugal) contain the original manuscripts. But they must be carefully analysed to write the history.
- The immense wealth of India came to be known to the western countries from the accounts of Marco Polo, an Italian merchant. The advent of printing press brought many manuscripts into book form. Hence the common people could source the knowledge of arts, literature, history and science.
- Ananda Rangam Pillai, who was a Dubash in French Pondicherry, used to record the events in his diary. It is famously known as 'Anandarangam Pillai Diary'. It contains daily events between 1736 and 1760. It is a valuable and reliable source to write history of Pondicherry under the French as he had involved himself in day-to-day work.

Archives

- Archives are the places which house safely the historical records for reference. The National Archives of India is located in New Delhi.
- It is one of the largest in Asia.

George William Forrest can rightly be called as the Father of National Archives of India.

Tamilnadu Archives

- The Tamilnadu Archives formery The Madras Record office is in Chennai. It is one of the oldest in South India.
- The most of the records in the Tamil Nadu archives are in English. The collections include series of administrative records in Dutch, Danish, Persian and Marathi. Few documents are in French, Portuguese, Tamil and Urdu.
- Tamil Nadu Archives has 1642 volumes of Dutch records which relate to Cochin and Coromandal coast. These records cover the period from 1657 – 1845. The Danian records cover the period from 1777 – 1845. Dodwell prepared with great effort and the first issue of the calendar of Madras records was published in 1917. He was highly interested in encouraging historical researches. He opened a new chapter in the History of Tamil Nadu Archives.
- Many paintings, statues, places of worship also form part of sources of history of modern period.

Buildings	
St. Francis Church	Cochin
St. Louis Fort	Pondicherry
St. George Fort	Chennai
St. David fort	Cuddalore
Parliament House	Delhi

- Coins are one of the other sources. Coins were issued for the first time in British India in 1862, when Edward VII ascended the throne after Queen Victoria. The Reserve Bank of India came into existence as 'Central Bank of India' in 1935. The first paper currency was issued by RBI in January 1938. It was a 5 rupee note bearing the portrait of King George VI.

In 1690, Fort St. David's was built by the British in Cuddalore.

Advent of Europeans

- When the Turks captured Constantinople in 1453 AD, the land route between India and Europe was closed. The Europeans were forced to find a new sea route to the East, as the Turks penetrated into North Africa and the Balkan Peninsula.
- Of all the European countries, Portugal was the pioneer to take a dynamic initiative to find a sea-route to India. Prince Henry of Portugal, popularly known as 'navigator' encouraged his countrymen to carry on explorations of the world. Bartholomew Diaz, a Portuguese Sailor reached the Southern-most tip of Africa in 1487. He was patronized by King John II of Portugal.
- Vasco da Gama, the famous Portuguese traveller set sail to India after crossing cape of Good Hope – the Southernmost tip of African continent. He continued upto Mozambique from where he sailed to India with the help of an Indian pilot and reached Calicut in 1498. The then king of Zamorin welcomed him.
- The second Portuguese traveller Pedro Alvares Cabral came with 1500 soldiers in 13 ships. Naturally, there arose conflict between the king and Pedro. Again Vasco da Gama came to India in 1501 with 20 ships and founded a trading centre at Cannanore followed by factories at Calicut and Cochin. The Zamorin attacked the Portuguese factory at Cochin

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but he was defeated as Cochin king did not help him. Thus Cochin became the capital for Portuguese activities and there they established the Portuguese East India Company. For the third time, Vasco da Gama came to India in 1524. He then fell ill and died in December 1524 at Cochin.

- Franchisco de Almeida was appointed as the first Governor of the Portuguese possessions in India. His aim was to develop naval power of the Portuguese in India. His policy was known as "Blue Water Policy". He served as Governor between 1505 and 1509.
- Before the advent of the Portuguese, the trade in the Malabar coast had been monopolised by the Arabs. (Egypt and Turkey) Indian rulers of Bijapur and Gujarat were apprehensive of the Portuguese expansion. Hence they joined together and engaged in a naval battle near Chaul. The Portuguese were defeated and Almeida's son was killed. In the second battle at Die, in 1509, Portuguese established the naval supremacy, by defeating the Muslim fleet.
- Alfonsa de Albuquerque was the real founder of the Portuguese rule in India. He captured Goa from the Sultan of Bijapur in November 1510. Portuguese authority was established in 1515 over Ormuz in Persian Gulf. He maintained cordial relations with Vijayanagar Empire under Krishnadevaraya. He encouraged marriages between Indians and the Portuguese.
- Nino de Cunha followed Albuquerque and he moved the capital from Cochin to Goa in 1530. In 1534, he acquired Bassein from Bahadur Shah of Gujarat. In 1537, Diu was occupied by the Portuguese. Then they wrested Daman. In 1548, the Portuguese occupied Salsette.
- Thus the Portuguese got control over Goa, Daman, Diu, Salsette, Bassein, Chaul and Bombay on the west coast, Hooghly and Santhome on the East Coast. Tobacco cultivation was brought to India by them. Printing press came into existence. A scientific work on the Indian medical plants by an European writer was printed in Goa in 1563. But in the 17th century, the Portuguese started declining yielding place to the Dutch and by 1739, the Portuguese could maintain stronghold in Goa, Daman & Diu only and it lasted upto December 1961.

The Dutch

- The Dutch followed the Portuguese. United East India Company of Netherlands was formed in 1602 for doing trade in East India. The Dutch founded their first factory at Masulipatnam in 1605. It captured Amboyna (Ambon Island) island in the Malaica Straits from the Portuguese and established Supremacy in the Spice Islands. They captured Nagapatnam from the Portuguese and strengthened their hold in South India. The Dutch shifted from their previous headquarters of Pulicat to Nagapatnam in 1690.
- The most important Indian commodities traded by the Dutch were silk, cotton, indigo, rice and opium. They monopolized the trade in black pepper and other spices. The important factories in India were Pulicat, Surat, Chinsura, Kasim bazaar, Patna, Nagapatnam, Balasore and Cochin.
- The conflicts between the Portuguese and the Dutch continued throughout the 17th century. In 1623, the Dutch killed ten English traders. This triggered the rivalry between the English and the Dutch. It came to an end with the defeat of the Dutch by the British in the Battle of Bedera in 1759. The Dutch lost all their settlements one by one and there was total wipe out in 1795.
- In Pulicat, the Dutch built a fort Geldria in 1613. Diamonds were exported from Pulicat to the western countries.
- The other Dutch colonial forts and possessions were Nagapattinam, Punnakayal, Porto Novo, Cuddalore and Devanampatinam.

The British

- Elizabeth, the Queen of England granted a charter to a company of merchants on 31st December 1600 to trade with East Indies. The company was headed by a governor and a court of 24 directors. Captain Hawkins visited Jahangir's court in 1608 to get certain concessions for the company. Hawkins secured permission to raise a settlement at Surat. Jahangir was forced to cancel the permission under the pressure of the Portuguese.
- In a naval battle that ensued between the British and the Portuguese at Surat, the Portuguese were defeated in 1612. The English established their factory at Surat in 1613. Another defeat of the Portuguese by the English in 1614, enhanced their prestige with the Emperor.
- Sir Thomas Roe, an English diplomat was sent by King James I of England to Jahangir's court in 1615. He stayed at the Mughal court for 3 years. During this period, the British could establish trading centres at Surat, Agra, Ahmedabad and Broach.
- The English established their first factory in 1611 at Masulipatnam on the East Coast which was under the control of the Kingdom of Golconda.
- In 1639, Francis Day, an English merchant obtained Madras on lease from Chennappa Nayaka, the ruler of Chandragiri and established a factory known as Fort St. George. It became the headquarters of the British and the first fort built by them.
- King Charles II of England got Bombay as dowry by marrying a Portuguese Princess. In 1668, the East India Company acquired the Bombay island at an annual rent of 10 pounds from Charles II.
- In 1690, a factory was established at Sutanuti by Job Charnock. The Zamindari rights of three villages Sutanuti, Kalikata and Govindpur were acquired by the British in 1698. These villages later grew into

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the city of Calcutta. The factory at Sutanuti and its fortified settlements were known as 'Fort William' in 1700.

- The British established their Supremacy and became a political power to reckon with after the Battle of Plassey in 1757 and the Battle of Buxar in 1764. Thus the East India Company held sway over India until 1858 when it was taken over by the Queen by Queen Victoria proclamation.

The Danish

Danish East India Company was established by the Charter issued by the King of Denmark Christian IV on 17th March 1616. They established settlements at Tranqueber (Tarangambadi) in Tamilnadu in 1620 and Serampore (Bengal) in 1676 Serampore became their headquarters. But they failed to strengthen their settlements. Ultimately, they sold all their settlements in India to the British in 1845.

Danish called Tranqueber as Danesborg. The king of Denmark sent Ziegenbalg to India. Ziegenbalg set up a printing press at Tranqueber (Tarangambadi).

The French

- The French East India Company was formed in 1664 by Colbert, a minister of King Louis XIV. The French were the last to set their foot in India. A French expedition came to India under Francois Caron. He founded the first factory at Surat in 1668. In 1669, Marcara founded second French factory at Masulipatnam by securing a patent from Sultan of Golkonda. In 1673, the settlement at Pondicherry was founded by Martin Luther under a grant from Sher Khan, the ruler of Bijapur.
- A fort by name St. Louis was built by Francois Martin in Pondicherry. In 1673, the French obtained permission from Shaista Khan, the Mughal Subedar (governor) of Bengal to establish a township at Chandranagore, near Calcutta.
- The French East India Company established factories in different parts of India, particularly in the coastal regions such Mahe, Karaikal, Balasore and Qasim Bazar. These were a few important trading Centers of the French East India Company.
- The French power got strengthened with the appointment of Joseph Francois Dupleix as governor as the French East India Company in 1742. He succeeded Dumas. The French settlements in India – Pondicherry, Karaikkal, Mahe and Yanam – were handed over India in 1954.

The Swedish : The Swedish East India Company was founded in Gothenburg, Sweden, in 1731 for the purpose of conducting trade with the Far East. The venture was inspired by the success of the Dutch East India Company and the British East India Company.

- The Portuguese were eliminated by the Dutch. The Dutch were extinguished by the British. The French neglected trade and entangled themselves with the British. The three "Carnatic wars" ruined the French. The wars paved the way for the expansion of British in India.

★ Objective Type Questions with Answers ★

Choose the correct answer :

1. **Who laid the foundation of Portuguese power in India ?**
   A) Vasco da Gama
   B) Bartholomew Diaz
   C) Alfonso de Albuquerque
   D) Almeida
   Ans : (C)

2. **Which of the following European Nation was the foremost attempt to discover a sea route to India?**
   A) Dutch **B)** Portugal
   C) France **D)** Britain
   Ans : (B)

3. **In 1453 Constantinople was captured by .....**
   A) The French **B)** The Turks
   C) The Dutch **D)** The British
   Ans : (B)

4. **Sir William Hawkins belonged to .....**
   A) Portugal **B)** Spain
   C) England **D)** France
   Ans : (C)

5. **The first fort constructed by the British in India was .....**
   A) Fort St. William **B)** Fort St. George
   C) Agra fort **D)** Fort St. David
   Ans : (B)

6. **Who among the following Europeans were the last to come India as traders?**
   A) The British **B)** The French
   C) The Danish **D)** The Portuguese
   Ans : (B)

7. **Tranqueber on the Tamilnadu coast was a trade centre of the .....**
   A) The Portuguese **B)** The British
   C) The French **D)** The Danish
   Ans : (D)

8. **The ..... of India attracted Europeans to this country.**
   A) technology **B)** machinery
   C) wealth **D)** river
   Ans : (C)

9. **Ananda Rangan's ..... reveal his profound capacity for political judgment.**
   A) Diaries **B)** Books
   C) Paintings **D)** Coins
   Ans : (A)

10. **The first issue of the calender of Madras records was published in .....**
    A) 1914 **B)** 1917
    C) 1918 **D)** 1920
    Ans : (B)

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PEOPLE'S REVOLT

Introduction

The establishment of political and economic dominance by the British over many parts of India after the Battle of Plassey, (1757) disrupted the political, social and economic order of the country. This led to divesting many landlords and chieftains of their power and estates. Naturally, many of them revolted against the British. The English assumed the rights of collecting the annual tribute from the Palayakkarar. The first resistance to the British was offered by the Pulithevar. Since then there had been rebellions by Palayakkarar such as the Veerapandiya Kattabomman, Oomathurai, Marudu brothers and Dheeran Chinnamalai.

Origin of Palayams

The Vijayanagar rulers appointed Nayaks in their provinces. The Nayak of Madurai in turn appointed Palayakkarar. Viswanatha became the Nayak of Madurai in 1529. He noticed that he could not control the chieftain who wanted more powers in their provinces. So with the consultation of his minister Ariyanatha Mudaliyar, Viswanatha instituted Palayakkarar system in 1529. The whole country was divided into 72 Palayams and each one was put under a Palayakkarar. Palayakkarar was the holder of a territory or a Palayam. These Palayams were held in military tenure and extended their full co-operation to the Nayaks. The Palayakkarars collected taxes, of which one third was given to the Nayak of Madurai another one third for the expenditure of the army and rest was kept for themselves.

Resistance of Palayakars of South against the British

- The decline of the Vijayanagara empire gave rise to Nayaka dynasty in Madurai. The Naicker dynasty divided their kingdom earlier held by the Pandyas, into 72 Palayams. Each Palayam was put under a 'Palayakar'. The city of Madurai was fortified with 72 bastions. This Palayakara system can be traced to that followed by **Kakathiyas in Warrangal in 1308.**
- This system worked well over two hundred years, from the Nayaks of Madurai until the takeover of these territories by the British.
- The eastern Palayams were Sattur, Nagalapuram, Ettayapuram, and Panchalamkurichi and the prominent western palayams were Uthumalai, Thalavankottai, Naduvakurichi, Singampatti, Seithur. During the seventeenth and eighteenth centuries the Palayakkars dominated the politics of Tamil country. They functioned as independent, sovereign authorities within their respective Palayams.
- Palayakars were in charge of public order, justice in their palayams – They have to pay a fixed annual tribute to the Nayak king. They could collect revenue from their palayams. They have to send troops in time of need.
- The Palayakars can be classified into western and eastern palayakars. The western palayakars were mostly Maravars and the eastern palayakars were Telugu speaking people.

Revolt of Palayakars

- The Nawab of Arcot had heavily borrowed from the British by pledging several villages. Huge arrears started mounting.
- Company's commander Yusuf Khan was entrusted the task with command of forces to collect the revenues.
- Yusuf Khan was born as Maruthanayagam Pillai in Ramanathapuram district. He got converted into Islam and joined the company under Clive during 1752 – 54. From 1756 to 1761, he was put in charge of the districts of Madurai and Tirunelveli. The service rendered by him was much appreciated by the English. He rebelled against the English when he was asked to serve Nawab of Arcot.
- But at the request of Nawab, the British force of 500 Europeans and 200 Sepoys, entered Madurai and Tirunelveli.
- This move irritated the Palayakars who offered stiff resistance.
- Nawab's elder brother Mazuf Khan along with English colonel Heron proceeded towards Tirunelveli.
- As this expedition against Kattabomman of Panchalakurichi failed, they had to retreat to Madurai. Heron was asked to storm the fort of Nel Kattum Sevel which was under a Maravar Palayakar, Puli Thevan who had wielded much influence from the neighbouring Palayakars who also belonged to the same community. He got the support of Travancore with the promise of handing over Kalakadu.
- Though Puli Thevan could form a confederacy of Thevar Palayams, Panchalakurichi and Ettaiyapuram did not join. Further the English could enlist the support of the rajas of Ramanathapuram and Pudukkottai. Puli Thevan tried to get the support of Hyder Ali and the French, but no help was forthcoming as Hyder was locked in a serious conflict with the Marathas.
- Mazuf Khan proceeded from Madurai with additional troops to face Puli Thevan. The force of Nawab was trounced at Kalakadu.
- Irritated by this, these events warranted direct participation of the British to deal with these Palayakars of Tirunelveli.
- Yusuf Khan under the company's command with arrival of guns from Trichy, battered the fort of Puli Thevan for about two months. Puli's all the forts of Nelkattum Sevel, Vasudevanallur and Panayur came under the control of Yusuf Khan.

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- As a consequence, the unity among Palayakars broke. Now Yusuf Khan started negotiating terms with Palayakars. This step irked the English. He was charged with treachery and hanged in 1764.
- After the death of Khan Sahib, Puli Thevar returned from exile and recaptured Nelkattum Seval in 1764. However, he was defeated by Captain Campbell in 1767. Puli Thevar escaped and died in exile.
- **Ondiveeran :** Ondiveeran led one of the army units of Puli Thevan against the British. It is believed that he lost one of his hands in the battle.

Velu Nachiyar

- Velu Nachiyar, daughter of Ramanathapuram Setupathy was married to Raja of Sivaganga. Her husband was killed by Nawab's forces. Hence she had to escape and was under the custody of Haider Ali at Virupachi near Dindigul. With the assistance of Gopala Naicker of Dindigul, Velu Nachiyar organised a fight with the British. They won the battle. She again entered Sivaganga and was crowned with the help of Marudu brothers who were given command of her forces. Again the English invaded Sivaganga. But by diplomatic moves there was no battle Velu Nachiyar, after making her son-in-law ruler of Sivaganga, in 1790, she died of sickness in 1796.
- Marudu Brothers who were in constant contact with Veerapandia Kattabomman, gave asylum to his brother Oomadurai, after Kattabomman was executed on 17th October 1799 at Kayathur. Under this guise, the English again invaded Sivaganga.

Marudu Brothers

- Chinna Marudhu and Periya Marudhu were chieftains of Sivaganga Samasthan towards the end of 18th century. They were known to fighting against the East India company. They were finally hanged by the British after a prolonged pitched struggle.
- Muthu Vaduganatha Thevan, who was the chieftain of Sivaganga, after having known the strength and the physical powers of these two brothers, Thevar invited them to join his small army. These two brothers had good contact with Veerapandiya Kattabomman and after his execution on 17th October 1799 at Kayathur, Chinna Marudhu gave asylum to Kattabomman's brother Oomadurai. British took this reason to invade Sivaganga and attacked them in 1801 in Kalayarkoil with a powerful army. But the Marudhu brothers annexed three districts of the British initially. British mobilised more troops. Many of the Marudhu commanders disappeared but regrouped to fight at Viruppachi, Dindigul and Cholapuram. While the battle of Tiruppachi was won by Marudhu group, in the other two, they lost. The Maruthu Pandiyars were captured along with the members of royal family of Sivaganga at Cholapuram and were hanged in Tiruppathur on 24th October 1801.

Veerapandya Kattabomman

- Veerapandya Kattabomman was a Palayakar of Panchalakurichi in Tirunelveli district. The collection of tribute had been a problem for the British with southern Palayakars. When the arrears were there from Panchalamkurichi, collector Jackson wrote to Kattabomman to pay the tribute in harsh words. Due to drought conditions, the southern Palayakars found it difficult to pay the tributes with arrears.
- Veerapandya Kattabomman had arrears of only **1080 pagodas.**
- However, Kattabomman was summoned by collector to meet him at Ramanathapuram. **Jackson** humiliated him without offering seat. After the wordy duel, a few sepoys appeared to arrest him. He escaped but his minister Siva Subramania Pillai was taken into custody.
- Kattabomman wrote a letter to Madras council detailing the incident at Ramanathapuram.
- On enquiry, Kattabomman was acquitted. But Jackson was dismissed from the service for his arrogant behaviour. Pillai was released.
- However Kattabomman could not reconcile himself. At that time, Marudu brothers, Gopala Nayak of Dindigul, Yadul Nayak of Anamalai were engaged themselves to form a confederacy against the British. Kattabomman came closer to Marudu brothers.
- The Palayakaras of mostly of southern area joined together under the leadership of Kattabomman to challenge the authority of the British. In May 1799, Lord Wellesley issued orders for the advance of troops from various places to face the challenge of these Palayakaras.
- On September 1, 1799, Major Bannerman wanted to see him at Palayamkottai. As Kattabomman dodged, the major ordered the army to reach Panchalamkurichi on 5th September 1799.
- They cut off all the communications to the fort. Bannerman deputed Ramalinganar to convey a message asking Kattabomman to surrender. Kattabomman refused. Ramalinganar gathered all the secrets of the Fort, and on the basis of his report, Bannerman decided the strategy of the operation. In a clash at Kallarpatti, Sivasubramanianar was taken a prisoner.
- In the battle ensued, the mud fort of Kattabomman could not withstand against the guns of the British. The garrison vacated and went to Kadalgudi. **Siva Subramania Pillai** was arrested, but Kattabomman escaped. Mr. Pillai was executed on 13th September at Nagalapuram.
- Kattabomman was caught by Vijaya Ragunatha Tondaiman, Raja of Pudukottai from the jungles of Kalapore and handed him over to the British.

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Role of Social Reformers

To erase out all the social evils imposed on women and to uplift them and bring them into national mainstream, many social reformers and societies came forward in the 19th and 20th centuries.

Raja Rammohan Roy

He was a civil servant under the British. He was one of the founders of 'Brahmo Samaj' which espoused the cause of women. He was given the title 'Raja II, by the Mughal Emperor Akbar II'. He is considered as 'father of Indian Renaissance'. He crusaded against Sati, Polygamy, Child marriage and Caste system.

He strongly believed that education only can be an instrument for social reform.

Ishwar Chandra Vidhyasagar

Born in 1820, Vidyasagar was the key figure in Bengal Renaissance. He was philosopher, academician and social reformer. He was against polygamy and advocated widow remarriage. He submitted many petitions to Legislative Council to the passing of Hindu Widow Remarriage Act. Consequently, the Council passed an Act in 1856. His son Narayana Chandra set an example of others by marrying a widow of his choice. Vidyasagar founded many schools for girls in the districts of Bengal.

Kandukuri Veeresalingam

He was a social reformer and writer in Madras Presidency. He is considered as the father of Renaissance Movement in Telugu. He published a journal named 'Viveka Vardhani'. He opened his first girls' school in 1874 and dedicated his life for widow remarriage and female education.

MG Ranade

Born in 1901, Ranade was one of the members of Indian National Congress. He was a social reformer, judge and author. He was a founder of the 'Social Conference Movement'. He was one of the founder of 'Widow Marriage Association' in 1861. He was one of the founders of Maharashtra Girls Education Society.

B.M. Malabari

Born in 1853, Malabari was a poet and social reformer. He was actively against child marriage. He published many pamphlets against child marriage.

Gopal Krishna Gokhale

Born in 1866, Gokhale founded 'Servants of India Society' in 1905. He espoused the cause of female education and social upliftment of depressed classes. His reforms brought many women into freedom struggle .

Periyar EVR

Periyar E.V.R. was one of the greatest social reformers of Tamil Nadu. He advocated women education, widow remarriage and inter-caste marriages and opposed child marriages.

Women Reformers

Most of the reform movements like Brahma Samaj (1828), Prarthana Samaj (1867) and Arya Samaj (1875) were led by male reformers who set the limit of the freedom and development of women. Women reformers like Pandita Ramabai, Rukhmanibai and Tarabai Shinde tried to extent further. In 1889, Pandita Ramabai opened Sarada Sadan (Home of Learning) for Hindu widows in Bombay. It was later shifted to Poona. Her greatest legacy was her effort, the first in India, to educate widows. Theosophical society was established at Chennai and Dr. Annie Besant who came from Europe and joined it. It also developed general social reform programmes.

Dr. S. Dharmambal was another reformer who was very much influenced by the ideas of Periyar. She showed great interest in implementing widow remarriage and women education. 'Moovalur Ramamirdham Ammaiyar' raised her voice against Devadasi system along with Dr. Muthulakshmi Ammaiyar. In her memory, the government of Tamil Nadu has instituted the "Moovalur Ramamirdha Ammal Ninaivu Marriage assistance scheme", a social welfare scheme to provide financial assistance to poor women.

To safeguard the interests of women, Women's India Association, National Council of Women in India and the All India Women's Conference were founded.

Women in Freedom Movement

Velunachiyar of Sivaganga fought against the British. Hazrat Begum and Rani Laxmibhai participated in the great revolt of 1857.

Women in Independent India

- Article 14 in the part III of our constitution, which contains fundamental rights, ensures equal pay for equal work for both men and women.
- National Policy of Education 1986 empowered women
- Compulsory reservation of 33 percent seats for women in panchayat, municipal and corporation elections.
- The National commission for women was set up in January 1992. It looks into the specific as well as general complaints brought to the notice of the commission.

The following legislations have enhanced the status of women in matters of marriage adoption and inheritance.

Legislation	Provisions
Bengal regulation of XXI, 1804	Female infanticide was declared illegal
Regulation of XVII,1829	Practice of sati was declared illegal
Hindus Widow's Remarriage Act, 1856	It permitted widow remarriage
The Native Marriage Act, 1872	The Child Marriage was prohibited
The Sharda Act,1930	The age of marriage was raised for boys and girls
Devadasi abolition Act, 1947	It abolished Devadasi system

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★ Objective Type Questions with Answers ★

Choose the correct answer :

1. **..... society is constantly changing with additions, assimilations and omissions from within and outside.**
   A) Human **B)** Animal
   C) Forest **D)** Nature **Ans : (A)**

2. **The first woman doctor in India was**
   A) Dharmambal
   B) Muthulakshmi Ammaiyar
   C) Moovalur Ramamirdham
   D) Panditha Ramabai **Ans : (B)**

3. **The practice of sati was abolished in .....**
   A) 1827 **B)** 1828
   C) 1829 **D)** 1830 **Ans : (C)**

4. **B.M Malabari was a**
   A) teacher **B)** doctor
   C) lawyer **D)** journalist **Ans : (D)**

5. **Which of the following was/were the reform movement(s) ?**
   A) Brahma Samaj **B)** Prarthana Samaj
   C) Arya Samaj **D)** All the above
   Ans : (D)

6. **The Bethune school was founded in ..... by J.E.D. Bethune.**
   A) 1848 **B)** 1849
   C) 1850 **D)** 1851 **Ans : (B)**

7. **Which commission recommended to start primary schools for girls in 1882 ?**
   A) Wood's **B)** Welby
   C) Hunter **D)** Muddiman
   Ans : (C)

8. **Who fought for the upliftment of women ?**
   A) Keshab Chandra Sen
   B) Jyoti Rao Phule
   C) Pandit Rama Bai
   D) All of the above **Ans : (D)**

9. **When was there a transitional development in the status of women restricting her role in the social life?**
   A) In Indus Valley Civilization
   B) In Rig Vedic Period
   C) In Later Vedic Period
   D) None of the above **Ans : (C)**

10. **The social evils which affected the position of women in the medieval period was/were .....**
    A) Purdah system **B)** Slavery
    C) Female infanticide **D)** All of the above
    Ans : (D)

11. **The Mughal ruler ..... attempted to abolish sati**
    A) Aurangazeb **B)** Jahangi
    C) Akbar **D)** Babur **Ans : (C)**

12. **Female infanticide was particularly in vogue in .....**
    A) Rajputana
    B) Punjab
    C) North Western Provinces
    D) All of the above **Ans : (D)**

13. **Sati was abolished during the time of .....**
    A) Lord William Bentinck
    B) Lord Cornwallis
    C) Lord Wellesley
    D) Lord Dalhousie **Ans : (A)**

14. **The person who was nominated to the Tamil Nadu Legislative Council in 1929 was .....**
    A) Moovalur Ramamirdham
    B) Dr. Muthulakshmi Ammaiyar
    C) Pandit Rama Bai
    D) Rajaji **Ans : (B)**

15. **Ranade started the National Social Conference in .....**
    A) 1829 **B)** 1853
    C) 1887 **D)** 1882 **Ans : (C)**

16. **Dr. Annie Besant came to India from .....**
    A) U.S.A **B)** Europe
    C) Australia **D)** Africa **Ans : (B)**

17. **Dr. S. Dharmambal was very much influenced by the ideas of .....**
    A) Gokhale **B)** Periyar
    C) Rajaji **D)** None of the above
    Ans : (B)

18. **The National Commission for women was set up in .....**
    A) 1947 **B)** 1950
    C) 1992 **D)** 2000 **Ans : (C)**

Fill in the blanks :

1. ..... society was setup by the Christian missionaries in 1819.
   Ans : Calcutta Female Juvenile

2. Servants of India Society was started by .....
   Ans : Gopala Krishna Gokhale

3. ..... was the one of the greatest social reformer of Tamil Nadu. **Ans : Periyar E.V.R**

4. Knadukuri Veeresalingam published a journal called ..... **Ans : Viveka vardhani**

5. Among the Rajputs of Rajasthan ..... was practiced.
   Ans : Jauhar

6. Purdah system became popular as a result of ..... invasion. **Ans : Muslim**

7. J.E.D. Bethune was the president of the council of education in ..... **Ans : Calcutta**

8. In ..... the women's medical service did a lot of work in training mid-wives. **Ans : 1914**

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The migration of male workers in search of jobs decreases the independent population of the source regions which increases the dependency ratio.

b) Social Consequences

Migrants acts as agents of social change. Migration leads to intermixing of people from diverse cultures. Especially migration from different regions towards an urban area leads to the formation of plural society.

c) Economic Consequences

- The migration of people to overcrowded cities results in the imbalance of the resource - population ratio. Migration affects the occupational structure of the population in both the regions.
- Brain drain is a consequence of migration. Brain drain refers to the migration in which skilled people from economically backward countries move to developed countries in search of better opportunities. Eventually, this leads to backwardness in source regions. This is called as **"backwash effect".**

d) Environmental Consequences

Large scale movement of people from rural to urban areas causes overcrowding in cities and puts heavy pressure on resources. It leads to rapid growth of cities. The over population in urban areas leads to the pollution of air, water and soil. Scarcity of drinking water, lack of space for housing, traffic congestions and poor drainage are the common environmental problems prevail in urban areas. The lack of space for housing and the rising of land cost lead to the formation of slums.

Urbanisation

Urbanisation can be referred as the process in which there is an increase in the proportion of population living in towns and cities.

Causes of Urbanisation

Urbanisation is driven by three factors: natural population growth, rural to urban migration and the reclassification of rural areas into urban areas. Present day urbanisation includes changes in demographics, land cover, economic processes and characteristics of geographic area.

In 2007, for the first time in history, the global urban population exceeded the global rural population and the world population has remained predominantly urban thereafter. (World Urbanisation Prospects, 2014)

Origin and Growth of World Urbanisation

Ancient Period

- The urban centres were started to develop during the pre-historic period itself.
- During this period primitive man started domestication of plants and animals. It was the period of development of permanent settlements. The river valley regions of the Egypt, Greece and India gave rise to agrarian communities which eventually formed the urban communities and urban centres. The excess production of food grains was the major reason for urbanisation. Ur and Babylon in Mesopotamia, Thebes and Alexandria in Egypt, Athens in Greece, Harappa and Mohenjodaro in India were noted prehistoric cities of the world.
- In ancient period the increase in the number and size of urban centres occurred during the two great colonizing periods of the Greeks and Romans. During the beginning of the 7th century itself many cities were found near the Aegean Sea. During the Greek colonizing period, the expansion of trade promoted the growth of towns and cities.

India, China and Nigeria – together are expected to account for 35 % of the growth in the world's urban population between 2018 and 2050. India is projected to add 416 million urban dwellers, China 255 million and Nigeria 189 million (World Urbanisation Prospects, 2018).

Medieval Period

- European Countries during Medieval Period expanded their overseas trade. This played an important role in the revival of European towns and cities after a period of staggered development. At the end of the 13th century, Paris, London, Geneva, Milan and Venice were the important cities found in Europe.
- In the context of India, the towns built by the Mughals were famous for their concentration of populations, their monumental buildings and their imperial grandeur and wealth. Agra, Delhi and Lahore are the Medieval cities which can be quoted as the examples.

Modern Period

- The industrial revolution in the 19th century accelerated the growth of towns and cities in Europe. Large number of new towns are emerged in North America and erstwhile Soviet union. In India, by the eighteenth century Madras, Calcutta and Bombay had emerged as important cities. The modern means of transport and communication, the development of new trade routes during 19th century had strengthened the trade centres and urban areas.
- The latest development in urbanisation was noticed in the continent of Africa. Before 1930, Africa had towns only on its coasts but now it has 50 towns with population exceeding 1,00,000. Major cities in Africa are Cairo, Nairobi, Mombasa, Bulawayo, Duala, Abidian, Logos, Accra, Addis Abba, Leopoldville, Luanda, Cape Town, Natal, Pretoria etc. Thus, in modern age, the accelerating urbanisation is resulting in a redistribution of population throughout the world.

In 1950, 30% of the world's population was urban, and by 2050, 68 % of the world's population is projected to be urban (World Urbanisation Prospects, 2018).

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World Urbanisation

S.No	Name of the Region	Urban Population in %
1.	North America	82
2.	Latin America and Caribbean	81
3.	Europe	74
4.	Oceania	68
5.	Asia	50
6.	Africa	43
	World Average	**55**

World Top Five Cities

S.No	Name of the City	Population in million
1.	Tokyo (Japan)	37
2.	Delhi (India)	29
3.	Shanghai (China)	26
4.	Mexico city (Mexico)	22
5.	Sao Paulo (Brazil)	22

Consequences of urbanisation

a) Development of Slums : With increasing rate of urbanisation, there is a lack of space for housing and a marked reduction in the quality of housing in the urban areas due to increase in population. Unregulated developments lead to the squatter settlements and slums in the urban areas.

b) Over Crowding : Over-crowding leads to scarcity of resources in the urban areas. Settlements with high population density act as conducive environment for spreading of disease, etc.

c) Water Supply, Drainage and Sanitation : No city has round the clock water supply in the world. Drainage situation is equally bad. The removal of garbage is a Himalayan task for urban local bodies.

d) Transportation & Traffic : Absence of planned and adequate arrangements for traffic and transport is another problem in urban centres. The increasing number of two wheelers and cars make the traffic problem worse. They cause air pollution as well.

e) Pollution : Towns and cities are the major polluters of environment. Several cities discharge their entire sewage and industrial effluents untreated into the nearby rivers. Industries in and around the urban centres pollute the atmosphere with smoke and toxic gases.

★ Objective Type Questions with Answers ★

Choose the correct answer

1. **People move from ..... to ..... mainly in search of better jobs.**
   A) Rural to Urban **B)** Urban to Rural
   C) Hills to plains **D)** Plains to hills **Ans : (A)**
2. **A person moves from his own country to another country is known as .....**
   A) Immigrant **B)** Refugee
   C) Emigrant **D)** Asylum seeker **Ans : (C)**
3. **The migration in search of fertile agricultural land is ..... migration**
   A) Rural to Rural **B)** Rural to Urban
   C) Urban to Rural **D)** Urban to Urban **Ans : (A)**
4. **War is one of the ..... causes of human migration**
   A) Demographic **B)** Socio-Cultural
   C) Political **D)** Economic **Ans : (C)**
5. **The main reason for the development of urbanisation in pre-historic period was .....**
   A) Production of food grains
   B) Domestication of cattle
   C) Fishing
   D) Hunting **Ans : (B)**
6. **..... is determined by three number of factors.**
   A) Globalisation **B)** Privatisation
   C) Liberalisation **D)** Urbanisation **Ans : (D)**
7. **Transhumance is also referred as ..... migration.**
   A) Seasonal
   B) Migration
   C) Socio Cultural Migration
   D) Mass Migration **Ans : (A)**
8. **Poverty is the major push factor operating in ..... areas.**
   A) Urban **B)** Rural
   C) Both **(A)** and **(B)** **D)** None of these **Ans : (B)**
9. **Delhi Metropolitan City in India has the ..... highest urban population in the world.**
   A) First **B)** Third
   C) Second **D)** Fourth **Ans : (C)**
10. **The favourable factors which attract people towards a location are called ..... factors.**
    A) Push **B)** Pull
    C) Natural **D)** All of these **Ans : (B)**
11. **The unfavourable factors which make the people to move out from a location are called ..... factors.**
    A) Push **B)** Pull
    C) Natural **D)** All of these **Ans : (A)**
12. **Migration that occurs across the national boundaries are known as ..... migration.**
    A) Urban **B)** Rural
    C) Involuntary **D)** International **Ans : (D)**

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Find out the correct statement :

1. **Assertion (A)** : Aurora is a curtain of colour lights appear in the sky.
   Reason (R) : They are caused by magnetic storms in the upper atmosphere.
   Select the correct answer :
   A) Both **(A)** and **(R)** are individually true and **(R)** is the correct explanation for **(A)**
   B) Both **(A)** and **(R)** are individually true but **(R)** is not the correct explanation for **(A)**
   C) **(A)** is true but **(R)** is false
   D) **(R)** is true but **(A)** is false
   Ans : (A)

2. **Assertion (A)** : A geological feature of Africa is the Great Rift Valley.
   Reason (R) : A Rift Valley is a large crack in the earth's surface formed by tectonic activity.
   Select the correct answer :
   A) Both **(A)** and **(R)** are individually true and **(R)** is the correct explanation for **(A)**
   B) Both **(A)** and **(R)** are individually true but **(R)** is not the correct explanation for **(A)**
   C) **(A)** is true but **(R)** is false
   D) **(R)** is true but **(A)** is false
   Ans : (A)

3. **Assertion (A)** : H.M. Stanley called Africa Dark continent.
   Reason (R) : In the beginning the interior of Africa was largely unknown to people.
   Select the correct answer :
   A) Both **(A)** and **(R)** are individually true and **(R)** is the correct explanation of **(A)**
   B) Both **(A)** and **(R)** are individually true and **(R)** is not the correct explanation of **(A)**
   C) **(A)** is true but **(R)** is false
   D) **(R)** is true but **(A)** is false
   Ans : (A)

4. **Assertion (A)** : The great Barrier Reef is one of the natural wonders of the world.
   Reason (R) : The Great Barrier Reef is formed by the tiny coral polyps.
   Select the correct answer :
   A) Both **(A)** and **(R)** are individually true and **(R)** is the correct explanation of **(A)**
   B) Both **(A)** and **(R)** are individually true and **(R)** is not the correct explanation of **(A)**
   C) **(A)** is true but **(R)** is false
   D) **(R)** is true but **(A)** is false
   Ans : (A)

Match the following :

1. **a)** Pinnacle – **1)** Equatorial forest
   b) Krill – **2)** Salt lake
   c) Ostrich – **3)** Small red fish
   d) Lake Eyre – **4)** Flightless bird
   e) Jewel of the earth – **5)** Pointed limestone pillars
   Codes :

	a)	b)	c)	d)	e)
A)	5	3	4	2	1
B)	3	4	2	1	5
C)	4	2	1	5	3
D)	2	1	5	3	4

Ans : (A)

2. **a)** Dark Continent – **1)** Explorer
   b) David Livingstone – **2)** Evergreen Forest
   c) Atlas mountain – **3)** Sheep rearing
   d) Congo Basin – **4)** Africa
   e) Karoo – **5)** Young fold mountain
   Codes :

	a)	b)	c)	d)	e)
A)	4	1	5	2	3
B)	1	5	2	3	4
C)	5	2	3	4	1
D)	2	3	4	1	5

Ans : (A)

3. **a)** Captain James Cook – **1)** New South Wales
   b) Uluru – **2)** Australian river
   c) Mt. Kosciuszko – **3)** Swamp forests
   d) Lachlan – **4)** Monolithic rock
   e) Melaleuca – **5)** Australia
   Codes :

	a)	b)	c)	d)	e)
A)	5	4	1	2	3
B)	4	1	2	3	5
C)	1	2	3	5	4
D)	2	3	5	4	1

Ans : (A)

4. **a)** Antarctica – **1)** Largest Animal
   b) White continent – **2)** Largest Research station
   c) Blue whale – **3)** India
   d) Mcmurdo – **4)** Continent of Science
   e) Bharathi – **e)** Antarctica
   Codes :

	a)	b)	c)	d)	e)
A)	4	5	1	2	3
B)	5	1	2	3	4
C)	1	2	3	4	5
D)	2	3	4	5	1

Ans : (A)

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MAP READING

Introduction

Maps and globe are important tools for Geographers. Maps help geographers compare places and relate people's activities to the locations where they live. Cartographers use various methods to make maps as precise as possible. They design maps in a way that they can be read and understood by people throughout the world.

Map

A map is a visual representation of an entire or a part of an area, typically represented on a flat surface. The work of a map is to illustrate specific and detailed features of a particular area, most frequently used to illustrate geography.

Map Reading

Map reading is an act of interpreting or understanding the geographic information portrayed on a map. By map reading, the reader should be able to develop a mental map of the real-world information by processing the symbolized information shown on maps.

Difference Between a Map and a Globe

Map is different from the globe. Map gives a two dimensional Representation of certain regions or the entire world while a globe gives a three dimensional Representation of the entire world and it is a miniature form of the earth (model of the earth).

The study and practice of many facets of maps and map making is called Cartography. It can be described as the art and science of map making.

Components of a map

The basic components of a map are : 1. Title 2. Scale. 3.Legend or key. 4. Direction 5. Source 6. Map projection and locational information and 7.Coventional signs and symbols.

a. Title

Title tells about the content of the map and is placed mostly at the top corner or at the bottom corner of the map.

b. Scale

- The scale is a ratio between the actual distance on the ground and the distance shown on the map. Generally the cartographers cannot draw maps the same size as the land. So, they reduce the size of land or features proportionally. For this purpose maps are drawn to scale. Each map has its own scale, which is indicated on the map. Often the scale is shown with a scale bar or a line and number and is placed just below the title or somewhere at the bottom of the map.
- To show large areas like continents or countries small scale maps are used. Small scale maps can show only major features omitting the minor ones due to lack of space .For example physical map of the world will show us only the major physical features in the world. It represents more area of the earth but gives us less information.
- To show a small area like a taluk or district large scale maps are used.
- The large scale maps portray the information in detail than the small scale maps. For example physical map of India represents a small area of the earth but gives us more information. However, there is no criteria for the classification of maps based on scale. It is only a comparative term.

Scales on maps can be represented in three different ways. They are :

1. Statement or Verbal scale
2. Representative Fraction (RF) or Ratio Scale
3. Graphical or Bar Scale

1. Statement or Verbal scale

In this method, the map scale is stated in words i.e., 1cm to 1km. It means 1cm distance on the map corresponds to 1 km distance on the ground. Thus it is written on the map like 1cm to 1km, 1inch to 1mile etc.

Simple statement scale has the following characteristics.

- If the numerator is in centimeter, the denominator is either in meters or kilometers
- If the numerator is in inch, the denominator is in miles

2. Representative Fraction (RF) or Numerical Fraction or Ratio Scale

- It shows the relationship between the map distance and the corresponding ground distance in the same units of length. R.F. is generally shown as a fraction.
- For example, a fraction of 1: 50,000 shows that one unit of length on the map represents 50,000 of the same units on the ground i.e., 1cm or 1 inch on the map represents 50,000 cm or 50,000 inches respectively on the ground.
- RF is represented as 1/ 50,000 or 1: 50,000.

3. Graphical or Bar Scale or Linear Scale

A graphic scale looks like a small ruler drawn at the bottom of the page. This line is divided and sub divided into lengths each of which represents a certain distance on the ground. In this way distances on the ground can directly be measured and read off from the map by using a piece of string or dividers. This scale has added advantage for taking copies of maps as the measurement does not change.

c. Legend or key

A map key or legend is included in a map to unlock it. It gives you the information needed for the map

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- **National Human Rights Commission :** It was setup on 12th October 1993. It is an independent, statutory body. Its headquarters is in New Delhi. It is a multi-member body with a chairman appointed by the president. They are appointed for a term of 5 years or till they attain the age of 70.
- State Human Rights Commission of Tamilnadu was formed on 17th April 1997. It functions at state level. It consists of 3 members including chairman. It enquires into the violation of human rights related to the subjects included in the state list.

Indian Constitution Article

24 - prohibits child labour.

39(f) - provides for children to develop in healthy manner.

45 – provides that the state shall endeavor to provide early childhood care and education for all children until they complete the age of six years.

Child Rights

- Children are important assets of any nation. Hence the convention on the Rights of the child was proclaimed by UNO on 20th November 1989.

UNO has declared

1978 as International year of women.

1979 as the International year of children.

- Right to Education Act (RTE) ensures under Article 21-A to provide compulsory education to all children aged between 6 and 14 years.
- The Child Labour Act (Prohibition and Regulation Act 1986) warrants that only children who have completed the age of 15 can be employed.
- The Juvenile Justice Act 2000 (Care and Protection of Children) tries to protect children deprived of adequate care and to reform the children by friendly approach.

POSCO Act 2012

Protection of Children from Sexual Offences Act deals severely with sexual assault on children.

1098 Child Line : This is India's first 24 hours' free emergency phone service for children in need of assistance. Special care is given for vulnerable children, those affected by child labour, child marriage and children affected by any abuse.

Women Rights

The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), adopted in 1979 by the UN General Assembly, is described as an International bill of rights for women.

Maintenance and Welfare of Parents and Senior Citizen Act 2007 : This Act makes it legal obligation for children and heirs to provide maintenance to senior citizens and parents. Protection and support during old age are envisaged as human rights.

Legislations	Provisions
The Hindu Widow Remarriage Act 1856	Legalised widow remarriage.
The Hindu Marriage Act 1955	States that the marriageable age for women is 21.
The Hindu Succession Act 1956	Ensures the right to women to inherit their parental property.
The Dowry Prohibition Act 1961	Provides drastic punishments for those ill-treating the bride in the name of dowry.
The Eve Teasing Act 1997	Gives relief to women.
Indecent Representation Act 1999	Prohibits the indecent representation of women in magazine, newspapers etc.
The Factory Act 1948, The Plantation Labour Act 1951, The Mines Act 1952, The Maternity benefit Act 1961	Protects the women workers.
Protection of Women from Domestic Violence Act 2005	Protects women from harassment by husband and family members.

★ Objective Type Questions with Answers ★

Choose the correct answer :

1. **After the Second World War ..... has taken several measures to protect the human rights.**
   A) UNO
   B) Supreme Court
   C) International Court of Justice
   D) None
   Ans : (A)

2. **In 1995 women from all over the world gathered at .....**
   A) Beijing **B)** New York
   C) Delhi **D)** None **Ans : (A)**

3. **The National Human Rights Commission was constituted in .....**
   A) 1990 **B)** 1993
   C) 1978 **D)** 1979 **Ans : (B)**

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4. **The UNO declared 1979 as the International year of .....**
   A) Girl Child **B)** Children
   C) Women **D)** None **Ans : (C)**

5. **When is Human Rights Day observed ?**
   A) 9th December **B)** 10th December
   C) 11th December **D)** 12th December
   Ans : (B)

6. **Which one is known as modern International Magna Carta of Human rights ?**
   A) UDHRC
   B) NHRC
   C) SHRC
   D) International year for women **Ans : (A)**

7. **Who can be appointed as the chairperson of the National Human Rights Commission**
   A) Retired judge of high court
   B) Any retired Chief Justice of the Supreme Court
   C) Any person appointed by the President
   D) Retired Chief Justice of India **Ans : (D)**

8. **How many articles does the Universal Declaration of Human Rights contain ?**
   A) 20 **B)** 30
   C) 40 **D)** 50 **Ans : (B)**

9. **What is the tenure of the Chairperson of the National Human Rights Commission ?**
   A) 5 years or upto 62 years of age
   B) 5 years or upto 65 years of age
   C) 6 years or upto 65 years of age
   D) 5 years or upto 70 years of age **Ans : (D)**

10. **Where is the headquarters of the National Human Rights Commission ?**
    A) Delhi **B)** Mumbai
    C) Ahmedabad **D)** Kolkata **Ans : (A)**

11. **The ..... was formed on 17th April 1997.**
    A) Universal Human Rights Commission
    B) State Human Rights Commission
    C) District Human Rights Commission
    D) Local Human Rights Commission **Ans : (B)**

12. **..... was established in the year 1945.**
    A) UNESCO **B)** SHRC
    C) NHRC **D)** UNO **Ans : (D)**

13. **..... are related to individuals and society.**
    A) Human Liberty **B)** Human Rights
    C) Human Freedom **D)** Petition of Right
    Ans : (B)

14. **One of the greatest achievements of ..... is the creation of Human Rights Law.**
    A) India **B)** United Kingdom
    C) United Nation **D)** All the above **Ans : (C)**

15. **Expanded form of UDHR .....**
    A) United Declaration of Human Rights
    B) Universal Declaration of Human Rights
    C) Universal Development of Health Rights
    D) Universal Declaration of Health Rights
    Ans : (B)

Fill in the blanks :

1. Each individual has ..... to lead a dignified life. **Ans : right**
2. Human rights are ..... rights. **Ans : fundamental rights**
3. The State Human Rights commission was formed on ..... **Ans : 17th April 1997**
4. Article 24 of Indian Constitution prohibits ..... **Ans : Child Labour**
5. United Nations Organisation was established in the year ..... **Ans : 24th October 1945**
6. Expanded form of ECOSOC ..... **Ans : The Economic and Social Council**
7. NHRC is an ..... and ..... body. **Ans : Independent statutory and non-constitutional**
8. NHRC is Multi member body which consists of a ..... and other members. **Ans : Chairperson**
9. NHRC has ..... division. **Ans : Five**
10. State Human Rights Commission consists of ..... members including Chairperson. **Ans : three**

Find out the correct statement :

1. **Find the wrong statement**
   A) National Human Rights Commission is a statutory body
   B) National Human Rights Commission is a constitutional body
   C) National Human Rights Commission is an independent body
   D) National Human Rights Commission is a multilateral institution **Ans : (B)**

2. **Which of the following statement is not correct about the National Human Rights Commission ?**
   A) It was established in 1993
   B) In the cases of human rights violation, the Commission has no rights to punish the culprit
   C) The Chairperson and members are of this Commission are appointed by the Supreme Court of India
   D) The Commission sends its annual report to the Central Government and State Governments
   Ans : (C)

3. **Assertion (A)** : Human Rights day is observed on 10th December.
   Reason (R) : It commemorates Eleanor Roosevelt's birthday.
   Select the correct answer :
   A) **(A)** is correct but **(R)** does not explain **(A)**
   B) **(A)** is correct but **(R)** explains **(A)**
   C) **(A)** and **(R)** are correct
   D) **(A)** and **(R)** are wrong **Ans : (A)**

4. **Assertion (A)** : Indian Constitution Article 39(f) provides for Children to develop in healthy manner.
   Reason (R) : The child is considered as an important national assets.

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★ Objective Type Questions with Answers ★

Choose the correct answer :

1. **The public sector in India owes its origin in the ..... Industrial policy resolution of the Government of India.**
   A) 1957 **B)** 1958
   C) 1966 **D)** 1956 **Ans : (D)**

2. **Mixed economy is the mixture of merits of both .....**
   A) Capitalism
   B) Socialism
   C) (A) & (B) are correct
   D) (A) & (B) are incorrect **Ans : (C)**

3. **..... is governed by a company law and controlled by the Government as principal major share holders.**
   A) Private Sector **B)** Joint Sector
   C) Public Sector **D)** None of these
   Ans : (B)

4. **Steel Authority of India Ltd (SAIL) is a ..... Industry.**
   A) Miniratna Industry
   B) Maharatna Industry
   C) Navaratna Industry
   D) None of these **Ans : (B)**

5. **Public Sector is on ..... motive.**
   A) Profit Motive
   B) Service Motive
   C) Speculative Motive
   D) None of these
   Ans : (B)

6. **The planning commission was formed in .....**
   A) 1950 **B)** 1947
   C) 1951 **D)** 1949 **Ans : (A)**

7. **'The Father of Public Sector undertakings in India' denotes to .....**
   A) Dr. V. Krishnamurthy
   B) Jawaharlal Nehru
   C) Rajaji
   D) None of the above
   Ans : (A)

8. **Which of the following does/do come under administration by a Government Department ?**
   A) Port and Telegraph
   B) Railways
   C) Irrigation projects
   D) All the above **Ans : (D)**

9. **Indian Synthetic Rubber Ltd comes under .....**
   A) Joint sector **B)** Private sector
   C) Public sector **D)** Public Corporation
   Ans : (A)

10. **National Health production Scheme serves .....**
    A) poor
    B) vulnerable families
    C) both (A) and (B)
    D) none of the above
    Ans : (C)

Fill in the blanks :

1. The ..... and ..... are allotted their respective roles in promoting the economic welfare of all sections of the community.
   Ans : Public sector and Private sector

2. The private sector is on ..... motive.
   Ans : profit

3. ..... is the process of social and economic development in a society.
   Ans : Socio Economic Development

4. The main function of private sector is to create ..... and .....
   Ans : Innovation and Moderisation

5. The government is committed to strengthening ..... and co-operation among the citizens.
   Ans : understanding

6. The sector, which is engaged in the activities of providing government goods and services to the general public is .....
   Ans : Public sector

7. The first industrial policy resolution was announced in ..... **Ans : 1948**

8. Indian Statistician ..... was instrumental to the formulation of public sector undertakings in India.
   Ans : P.C. Mahalanobis

9. The 1991 industrial policy gave more freedom to the ..... sector. **Ans : Private**

10. LIC, Air India, The Reserve Bank of India, Electricity Board come under the ..... type of organisation.
    Ans : Public Corporation

11. NITI Aayog refers to .....
    Ans : National Institution for Transforming India

12. ..... is government of India's flagship programme.
    Ans : Sarva Siksha Abhiyan (SSA)

13. National Gas Commission (ONGC) has saved foreign exchange by way of .....
    Ans : Import Substitution

14. The largest public sector employer in India is .....
    Ans : Indian Railways

15. Tata group of companies come under ..... sector.
    Ans : Private

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Find out the correct statement :

1. **I.** The industries which would be exclusively owned by the state are referred to as Schedule-A
   II. The industries in which the private sector could supplement the efforts of the state sector, with the state taking the sole responsibility for starting new units which are specific in Schedule-B
   III. The remaining industries which were in the private sector are not mentioned in Schedule.

   Select the correct answer :
   A) All are correct
   B) **(I)** and **(III)** are correct
   C) **(I)** and **(II)** are correct
   D) None of these

   Ans : (C)

2. **I)** Public sector and capital formation is very important during the planning period.
   II) Public sector undertaking have located their plants in well developed areas.
   III) Public sector has created millions of jobs to tackle the unemployment problem in the country.

   Select the correct answer :
   A) All are correct
   B) **(I)** and **(III)** are correct
   C) **(I)** and **(II)** are correct
   D) None of these **Ans : (B)**

3. **Which is the odd one :**
   A) SAIL **B)** BHEL
   C) GAIL **D)** EIL **Ans : (D)**

4. **Which one of the following is not the indicator of the Socio Economic Development.**
   A) Black Money
   B) Life Expectancy
   C) Gross Domestic Product (GDP)
   D) Employment **Ans : (A)**

Match the following :

1. **a)** Think Tank – **1)** NITI Aayog
   b) Agriculture – **2)** Gross Domestic product
   c) Industries – **3)** NITI Aayog
   d) GDP – **4)** Navaratna Industry
   e) BHEL – **5)** Secondary Sector

   Codes :

	a)	b)	c)	d)	e)
A)	3	1	5	2	4
B)	1	5	2	4	3
C)	5	2	4	3	1
D)	2	4	3	1	5

   Ans : (A)

2. **a)** FCI – **1)** Sarva Siksha Abhiyan
   b) NHPS – **2)** State Trading Corporation
   c) SSA – **3)** National Aluminium Company
   d) STC – **4)** Food Corporation of India
   e) NALCO – **5)** National Health Production Scheme

   Codes :

	a)	b)	c)	d)	e)
A)	4	5	1	2	3
B)	5	1	2	3	4
C)	1	2	3	4	5
D)	2	3	4	5	1

   Ans : (A)

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