PHYSICS

1. Matter

1. **A solid has**
   A) definite volume and no definite shape
   B) no definite volume no definite shape
   C) definite shape and volume
   D) definite shape but no definite volume

2. **A liquid has**
   A) definite volume and no definite shape
   B) no definite volume no definite shape
   C) definite shape and volume
   D) definite shape but no definite volume

3. **A gas has**
   A) definite volume and no definite shape
   B) no definite volume no definite shape
   C) definite shape and volume
   D) definite shape but no definite volume

4. **Which of the following is NOT a property of particles of a matter?**
   A) The particles of matter are extremely small
   B) The particles of matter have spaces between them.
   C) The particles of matter are in stationary state.
   D) The particles of matter attract each other.

5. **Which of the following has minimum spaces among the particles?**
   A) Solids
   B) Liquids
   C) Gases
   D) None of these

6. **During summer, water kept in an earthen pot becomes cool because of the phenomenon of**
   A) diffusion
   B) transpiration
   C) osmosis
   D) evaporation

7. **Rate of diffusion is the fastest in**
   A) Solids
   B) Liquids
   C) Gases
   D) None of these

8. **Thermal conduction takes places in**
   A) solids only
   B) liquids only
   C) gases only
   D) solids, liquids and gases.

9. **Evaporation always causes**
   A) thermal expansion
   B) Liquification
   C) Cooling down
   D) all of these

10. **A change of state directly from solid to gas without changing into liquid state (or vice versa) is called**
    A) Evaportion
    B) Sublimation
    C) Diffusion
    D) Condensation

11. **The rate of evaporation decreases with**
    A) increase in humidity
    B) increase of temperature
    C) increase in wind speed
    D) increase of surface area

ANSWERS

1. (C) 2. (A) 3. (B) 4. (C) 5. (A) 6. (B) 7. (C) 8. (D) 9. (C) 10. (B)
11. (A)

2. Motion

1. **A train moving with a uniform speed of 54 kmph. What is its speed in m/s?**
   A) 15 m/s   **B)** 1.5 m/s
   C) 9 m/s   **D)** 90 m/s

2. **A scalar quantity has _____**
   A) magnitude only
   B) direction only
   C) both direction and magnitude
   D) none of these

3. **When an object undergoes acceleration**
   A) there is always an increase in its velocity
   B) there is always an increase in its speed
   C) a force always acting on it
   D) all of the above.

4. **A truck covers 40 km with an average speed of 80km/h. Then it travels another 40 km with an average speed of 40 km/h. The average speed of the truck for the total distanced covered is**
   A) 40 km/h   **B)** 45km/h
   C) 48km/h   **D)** 53km/h

5. **The SI unit of retardation is**
   A) ms^{-1} **B)** ms^{-2}
   C) ms^2 **D)** m

6. **A car starts from city A and it travels 50 km in a straight line to city B. Immediately it turns around, and returns to city A. It took 2 hours for this round trip. The average speed of the car for this round trip is**

   A) 0 km/h   **B)** 25 km/h
   C) 50 km/h   **D)** 100 km/h

7. **The equation v = u + at gives information as**
   A) velocity is a function of time.
   B) velocity is a function of position.
   C) Position is a function of time.
   D) Position is function of velocity and time.

8. **Which of the following can determine the acceleration of a moving object?**
   A) area of velocity-time graph
   B) slope of velocity-time graph
   C) area of distance-time graph
   D) slope of the distance time-graph

9. **A body is projected up with an initial velocity u m/s. It goes up to a height h metres in t seconds time. Then it comes back at the point of projection. Considering negligible air resistance, which of the following statement is true?**
   A) the acceleration is zero
   B) the displacement is zero
   C) the average velocity is 2h/t
   D) the final velocity is 2u when body reaches projection point.

10. **A car accelerates at 1.5 m/s² in a straight road. How much is the increase in velocity in 4s?**
    A) 6 m/s   **B)** 4 m/s
    C) 3 m/s   **D)** 2.66 m/s

ANSWERS

1. (A)   2. (A)   3. (C)   4. (D)   5. (B)   6. (C)   7. (A)   8. (B)   9. (B)   10. (A)

3. Force

1. **An object moving at constant velocity in an inertial frame must**
   A) have a net force acting on it
   B) have zero net force acting on it
   C) not have any force of gravity on it
   D) stop after some time due to gravity

2. **When a bus starts suddenly from rest, the passengers sitting inside the bus move backwards. This illustrates an example of**
   A) Newton First Law of Motion
   B) Newton Second Law of Motion
   C) Newtons Third Law of Motion
   D) None of these

3. **One newton is the force _____**
   A) of gravity on a 1 kg body
   B) of gravity on a 1 g body
   C) which gives a 1 g body an acceleration of cm/s^2
   D) which gives a 1 kg body an acceleration of m/s^2

4. **The property of inertia is the largest in**
   A) a toy car   B) a motorcycle
   C) a car   D) a truck

5. **A force of 5N acts on a body. What is the acceleration produced in m/s^2, if the weight of the body is 9.8N.**
   A) 5   B) 0.5
   C) 1.96   D) 49

6. **Acceleration acts always in the direction _____**
   A) of the displacement
   B) of the initial velocity
   C) of the net force
   D) of the final velocity

7. **The acceleration produced in a body by an acting force of given magnitude depends upon _____.**
   A) size of the body
   B) mass of the body
   C) shape of the body
   D) all of these

8. **A ball is moving in a circle at fixed speed. Which of the following statement is TRUE?**
   A) There is no acceleration present.
   B) There must be only one force acting on it.
   C) Acceleration is present but has constant magnitude.
   D) Acceleration is present and acts tangent to the circle.

9. **Action and reaction act on**
   A) same body but in opposite directions
   B) same body and in same direction
   C) different bodies but in opposite directions
   D) different bodies but in same direction

10. **A body of weight W is suspended from the ceiling of a room through a rope of weight R. The ceiling pulls the rope by a force of**
    A) W
    B) R
    C) W + R
    D) (W+R)/2

ANSWERS

1. (B)   2. (A)   3. (D)   4. (D)   5. (A)   6. (C)   7. (B)   8. (C)   9. (A)   10. (C)

4. Gravitation

1. A thief stole a box with valuable article of weight 'W' and jumped down a wall of height h. Before he reach the ground he experienced a load of
   - A) zero
   - B) W / 2
   - C) W
   - D) 2 W

2. The acceleration due to gravity g and mean density of the earth ρ are related by which of the following relation? Where g is gravitational constant and R is radius of the earth

   - A) $\rho = \dfrac{4\pi gR^2}{3G}$
   - B) $\rho = \dfrac{4\pi gR^3}{3G}$
   - C) $\rho = \dfrac{3g}{4\pi GR}$
   - D) $\rho = \dfrac{3g}{4\pi GR^3}$

3. When the planet comes nearer the sun moves
   - A) fast
   - B) slow
   - C) constant at every point
   - D) none of the above

4. Kepler's second law regarding constancy of arial velocity of a planet is a consequence of the law of conservation of
   - A) energy
   - B) angular momentum
   - C) linear momentum
   - D) none of these

5. The period of geostationary artificial satellite is
   - A) 24 hours
   - B) 6 hours
   - C) 12 hours
   - D) 48 hours

6. A geostationary satellite is orbiting the earth at a height of 6R above the surface of the earth, R being the radius of the earth. The time period of another satellite at a height of 2.5 R from the surface of earth is
   - A) $6\sqrt{2}$ hr
   - B) 6 hr
   - C) $5\sqrt{2}$ hr
   - D) 10 hr

7. The distance of Neptune and Saturn from the Sun are nearly 10^{13} m and 10^{12} m respectively. Assuming that they move in circular orbits, their periodic times would be in the ratio of
   - A) 10
   - B) 100
   - C) $10\sqrt{10}$
   - D) 1000

8. A satellite is orbiting close to the surface of the earth, then its speed is
   - A) $\sqrt{2gR}$
   - B) Rg
   - C) $\sqrt{Rg}$
   - D) $\sqrt{\dfrac{Rg}{2}}$

9. If the gravitational force between two objects were proportional to 1/R (and not as 1/R²) where R is separation between them, then a particle in circular orbit under such a force would have its orbital speed v proportional to
   - A) $\dfrac{1}{R^2}$
   - B) R^0
   - C) R^1
   - D) $\dfrac{1}{R}$

10. Imagine a light planet revolving around a very massive star in a circular orbit of radius R with a period of revolution T. If the gravitational force of attraction between the planet and the star is proportional to $R^{-5/2}$ then
    - A) $T^2 \alpha R^2$
    - B) $T^2 \alpha R^{7/2}$
    - C) $T^2 \alpha R^{3/2}$
    - D) $T^2 \alpha R^3$

11. The period of a satellite in a circular orbit of radius R is T. The period of another satellite in circular orbit of radius 4R is
    - A) T/4
    - B) 8T
    - C) 2T
    - D) T/8