## Part I-Electrical \& Electronics Engineering

## 1. Analog \& Digital Electronics

1. Any number with an exponent of zero is equal to
A) zero
B) one
C) that number
D) ten
2. In the decimal numbering system, what is MSD ?
A) The middle digit of a stream of numbers
B) The digit to the right of the decimal point
C) The last digit on the right
D) The digit with the most weight
3. Which of the following statements does not describe an advantage of digital technology?
A) The values may vary over a continuous range
B) The circuits are less affected by noise
C) The operation can be programmed
D) Information storage is easy
4. The Generic array logic (GAL) device is
A) one time programmable
B) Reprogrammable
C) A CMOS device
D) Reprogrammable and a CMOS device.
5. The range of voltages between VI (max) and VH(min) are
A) unknown
B) unnecessary
C) unacceptable
D) between 2 V and 5 V
6. What is digital to analog converter ?
A) It takes the digital information from an audio CD and converts it to a usable form.
B) It allows the use of cheaper analog techniques, which are always simpler.
C) It stores digital data on a hard drive.
D) It converts direct current to alternating current.

| 1. (B) | 2. (D) | 3. (A) | 4. (B) | 5. (C) |
| ---: | ---: | ---: | ---: | ---: |
| 11. (A) | 12. (B) | $13 .(\mathrm{B})$ |  |  |

7. What are the symbols used to represent digits in the binary number system?
A) 0,1
B) $0,1,2$
C) 0 through 8
D) 1,2
8. A full subtracter circuit requires
A) Two inputs and two outputs
B) Two inputs and three outputs
C) Three inputs and one output
D) Three inputs and two outputs
9. The outputs of an AND Gate is low
A) all the time
B) when any input is low
C) when any input is high
D) when all inputs are high
10. Give the decimal value of binary 10010
A) $6_{10}$
B) $\mathbf{9}_{10}$
B) $20{ }_{10}$
C) $18_{10}$
11. Parallel format means that:
A) each digital signal has its own conductor
B) several digital signals are sent on each conductor.
C) both binary and hexadecimal can be used
D) no clocks needed
12. A decoder converts $\qquad$
A) Noncoded information into coded form
B) Coded information into noncoded form
C) HIGHs to LOWs
D) LOWs to HIGHs
13. A DAC (Digital to Analog converter) changes
A) An analog signal into digital data
B) Digital data into an analog signal
C) Digital data into an amplified signal
D) None of the above
14. (A) $\quad$ 7. (A) $\quad$ 8. (D) $\quad$ 9. (B) $\quad 10 .(\mathrm{C})$

## SURA'S * ELECTRICAL \& ELECTRONICS ENGINEERING

14. The output of a NOT gate is high when
A) The input is low
B) The input is high
C) The input changes from low to high
D) Voltage is removed from the gate
15. The output of an orgate is low when $\qquad$
A) all inputs are low
B) any inputs is low
C) any inputs is high
D) Any inputs are high
16. Which of the following is not a analog device?
A) Thermocouple
B) Current flow in a circuit
C) Light Switch
D) Audio microphone
17. A demultiplexer has $\qquad$
A) one data input and a number of selection inputs, and they have several outputs.
B) one input and one output
C) several inputs and several outputs
D) several inputs and one output
18. A flip-flop has $\qquad$
A) one stable state
B) no stable state
C) two stable state
D) none of the above
19. In a certain digital waveform, the period is four times the pulse width. The duty cycle is
A) $0 \%$
B) $25 \%$
C) $50 \%$
D) $100 \%$
20. In positive logic $\qquad$
A) A High $=1$, A Low $=0$
B) A Low $=1$, A High $=0$
C) Only Highs are present
D) Only Lows are present
21. Convert the fractional binary number 0000.1010 to decimal
A) 0.625
B) 0.50
C) 0.55
D) 0.10
22. A common instrument used in trouble shooting a digital circuit is a $\qquad$
A) Logic probe
B) Oscilloscope
C) Pulser
D) All of the above
23. What is one relative disadvantages of serial transfer?
A) It requires too many conductors
B) Its interconnect system is complex
C) It is slow
D) It can only be used over very short distance
24. Which format requires fever conductors?
A) Parallel
B) Serial
C) Both are the same
D) Cannot tell
25. A pulse has a period of 15 ms . Its frequency is $\qquad$
A) 6.66 HZ
B) 66.66 HZ
C) 666.66 HZ
D) 15 HZ
26. Give the decimal value of binary 1000010
A) $134_{10}$
B) $144_{10}$
C) $110{ }_{10}$
D) $126_{10}$
27. A decoder is a $\qquad$ . and $\qquad$ logic circuit that converts coded inputs into coded outputs, where the input and output codes are different.
A) Single input and single output
B) single input and multiple output
C) multiple input and multiple output
D) all the above
28. What is an analog to digital converter?
A) It makes digital signals.
B) It takes analog signals and puts them in digital format.
C) It allows the use of digital signals in everday life.
D) It stores information on a CD.


## SURA'S * ELECTRICAL \& ELECTRONICS ENGINEERING

29. A multiplexer has $\qquad$
A) One input and several outputs
B) One input and one output
C) Several inputs and several outputs
D) Several inputs and one output
30. What is the decimal value of $2^{3}$ ?
A) 2
B) 4
C) 6
D) 8
31. An encoder converts $\qquad$
A) noncoded information into coded form
B) coded information into noncoded form
C) Highs to Lows
D) Lows to Highs
32. What kind of logic device or circuit is used to store information?
A) Counter
B) Resister
C) Inverter
D) Buffer
33. PLCC packages have leads on $\qquad$
A) one side
B) two sides
C) three sides
D) four sides
34. What is the typical invalid voltage for a binary signal?
A) $0.7-2.8$ volts
B) $0.8-3.0$ volts
C) $0.8-2.0$ volts
D) $0.7-2.5$ volts
35. How many binary bits are necessary to represent 748 different numbers ?
A) 9
B) 7
C) 10
D) 8
36. A periodic digital waveform has a pulse width (tw) of 6 ms and a period ( T ) of 18 Ms . The duty cycle is $\qquad$
A) $3.3 \%$
B) $33.3 \%$
C) $6 \%$
D) $18 \%$
37. Yagi antenna is used for receiving
A) Radio signals
B) Television signals
C) Both A and B
D) None of these
38. What is the decimal value of $\mathbf{2}^{-1}$ ?
A) 0.5
B) 0.25
C) 0.05
D) 0.1
39. Which format can send several bits of information faster?
A) Parallel
B) Series
C) Both A G B
D) None of these
40. The frequency of a pulse train is 2 KHz . The pulse period is $\qquad$
A) 5 ms
B) 50 ms
C) 500 Ns
D) 2 Ns
41. A type of digital circuit technology that uses bipolar junction transistor is $\qquad$
A) TTL
B) CMOS
C) LSI
D) NMOS
42. How many unique symbols are used in the decimal number system?
A) One
B) Nine
C) Ten
D) Unlimited
43. A classification of ICs with complexities of 12 to 100 equivalent gates on a chip is known as $\qquad$
A) SSI
B) MSI
C) LSI
D) VLSI
44. Which of the following is a semiconductor memory ?
A) RAM
B) MAR
C) CD-ROM
D) $C D$
45. A classification of ICs with complexities of 100 to 1000 equivalent gates per chip is known as $\qquad$
A) SSI
B) MSI
C) LSI
D) VLSI
46. The output of an AND Gate with three inputs $A, B$ and $C$ is high when $\qquad$
A) $\mathrm{A}=1, \mathrm{~B}=1, \mathrm{C}=0$
B) $\mathrm{A}=0, \mathrm{~B}=0, \mathrm{C}=0$
C) $\mathrm{A}=1, \mathrm{~B}=1, \mathrm{C}=1$
D) $\mathrm{A}=1, \mathrm{~B}=0, \mathrm{C}=1$

| 29. (D) | 30. (D) | 31. (A) | 32. (B) | 33. (D) | 34. (C) | 35. (C) | 36. (B) | 37. (B) | 38. (A) |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 39. (A) | 40. (C) | 41. (A) | 42. (C) | 43. (B) | 44. (A) | 45. (C) | 46. (C) |  |  |
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47. If a 3 input NOR Gate has eight input possibilities, then how many of those possibilities will result in a high output?
A) 1
B) 2
C) 7
D) 8
48. If a signal passing through a gate is inhibited by sending a low into one of the inputs, and the output is high, the gate is a $\qquad$
A) AND
B) NAND
C) NOR
D) OR
49. A device used to display one or more digital signals so that they can be compared to expected timing diagram for the signals is a
A) DMM
B) spectrum analyser
C) logic analyser
D) frequency counter
50. When used with an IC, what does the term "QUAD" indicate?
A) 2 circuits
B) 4 circuits
C) 6 circuits
D) 8 circuits
51. The output of an OR gate with three inputs $A, B$ and $C$ is low when $\qquad$
A) $\mathrm{A}=0, \mathrm{~B}=0, \mathrm{C}=0$
B) $\mathrm{A}=0, \mathrm{~B}=0, \mathrm{C}=1$
C) $\mathrm{A}=0, \mathrm{~B}=1, \mathrm{C}=1$
D) all of the above
52. Which of the following logical operations is represented by the $t$ sign in Boolean algebra?
A) Inversion
B) AND
C) OR
D) Complementation
53. Output will be a low for any case when one or more inputs are zero in $a(n)$ $\qquad$
A) OR Gate
B) NOT Gate
C) AND Gate
D) NOR Gate
54. How many pins does the 4049 IC have?
A) 14
B) 16
C) 18
D) 20
55. TTL operates from a $\qquad$
A) 9 volt supply
B) 3 volt supply
C) 12 volt supply
D) 5 volt supply
56. The output of a Nor Gate is high if $\qquad$
A) all inputs are high
B) any input is high
C) any input is low
D) all input are low
57. The switching speed of CMOS is now $\qquad$
A) Competitive with TTL
B) Three times that of TTL
C) Slower than TTL
D) Twice that of TTL
58. The format used to present the logic output for the various combination of logic inputs to a gate is called a $\qquad$
A) Boolean Constant
B) Boolean Variable
C) Truth table
D) Input logic function
59. The power dissipation, $P_{D}$ of a logic gate is the product of the $\qquad$
A) DC supply voltage and the peak current
B) DC supply voltage and the average supply current
C) DC supply voltage and the peak current
D) DC supply voltage and the average supply current.
60. The Boolean expression for a 3 input and Gate.
A) $X=A B$
B) $X=A B C$
C) $X=A+B+C$
D) $X=A B+C$
61. A CMOS IC operating from a 3 volt supply will consume $\qquad$
A) Less power than a TTL IC
B) More power than a TTL IC
C) The same power as a TTL IC
D) No power at all
62. What are the pin numbers of the outputs of the gates in a 7432IC?
A) 3,6,10 and 13
B) $1,4,10$ and 13
C) 3,6,8 and 11
D) 1,4,8 and 11

