

098/23

Question Booklet Alpha Code

A

A

Question Booklet Sl. No.

Total Number of Questions : 100

Time : 90 Minutes

Maximum Marks : 100

INSTRUCTIONS TO CANDIDATES

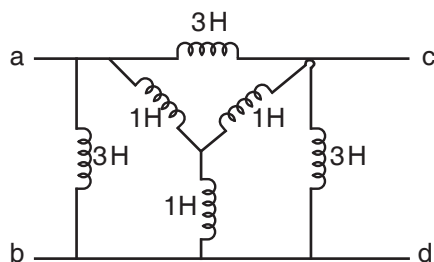
1. The Question Paper will be given in the form of a Question Booklet. There will be four versions of Question Booklets with Question Booklet Alpha Code viz. **A, B, C & D**.
2. The Question Booklet Alpha Code will be printed on the top left margin of the facing sheet of the Question Booklet.
3. The Question Booklet Alpha Code allotted to you will be noted in your seating position in the Examination Hall.
4. If you get a Question Booklet where the alpha code does not match to the allotted alpha code in the seating position, please draw the attention of the Invigilator **IMMEDIATELY**.
5. The Question Booklet Serial Number is printed on the top right margin of the facing sheet. If your Question Booklet is un-numbered, please get it replaced by new Question Booklet with same alpha code.
6. The Question Booklet will be sealed at the middle of the right margin. Candidate should not open the Question Booklet, until the indication is given to start answering.
7. Immediately after the commencement of the examination, the candidate should check that the Question Booklet supplied to him/her contains all the 100 questions in serial order. The Question Booklet does not have unprinted or torn or missing pages and if so he/she should bring it to the notice of the Invigilator and get it replaced by a complete booklet with same alpha code. This is most important.
8. A blank sheet of paper is attached to the Question Booklet. This may be used for rough work.
9. **Please read carefully all the instructions on the reverse of the Answer Sheet before marking your answers.**
10. Each question is provided with four choices **(A), (B), (C)** and **(D)** having one correct answer. Choose the correct answer and darken the bubble corresponding to the question number using Blue or Black Ball Point Pen in the OMR Answer Sheet.
11. **Each correct answer carries 1 mark and for each wrong answer 1/3 mark will be deducted. No negative mark for unattended questions.**
12. No candidate will be allowed to leave the examination hall till the end of the session and without handing over his/her Answer Sheet to the Invigilator. Candidates should ensure that the Invigilator has verified all the entries in the Register Number Coding Sheet and that the Invigilator has affixed his/her signature in the space provided.
13. Strict compliance of instructions is essential. Any malpractice or attempt to commit any kind of malpractice in the Examination will result in the disqualification of the candidate.

A

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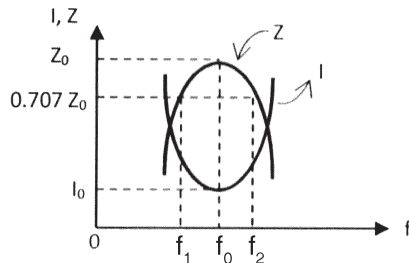
- How much time does a capacitor take to build up a charge with 10 mJ of energy, if the charging current of 100 mA taken by a 100 μF capacitor ?
 A) 13.312 ms
 B) 12.54 ms
 C) 14.14 ms
 D) 12.12 ms
- A resistance load being connected to a DC network, receives maximum power when the load resistance is equal to the internal resistance of the source network as seen from the load terminals.
 A) Maximum power transfer theorem
 B) Thevenin's theorem
 C) Super position theorem
 D) None of the above
- An LC circuit stores a total energy of E and the maximum charge on the capacitor is assumed as Q . What will be the energy stored in the inductor while the charge on the capacitor is $Q/2$?
 A) $2E/3$
 B) $E/3$
 C) E
 D) $3E/4$
- What will be the equivalent inductance seen between the terminal a-b for the given circuit ?



- A) 1.23 H
 B) 1 H
 C) 3.0 H
 D) 1.5 H

5. Average current value of a Sine wave is
- A) $0.707 I_{\text{Peak}}$
 - B) $0.636 I_{\text{Peak}}$
 - C) $1.33 I_{\text{Peak}}$
 - D) $1.414 I_{\text{Peak}}$
6. For a mutually coupled coils L1 and L2, the coefficient of coupling is given by the expression
- A) K only
 - B) $K \times L_1 \times L_2$
 - C) $K \times \sqrt{(L_1 \times L_2)}$
 - D) None of the above
7. The equation for EMF induced in a coil rotated in uniform magnetic field by an angle θ from its vertical position
- A) E_m
 - B) $E_m \cos \omega t$
 - C) $e \times \sin \omega t$
 - D) $E_m \sin \omega t$
8. The bandwidth of an RLC series circuit with resistance, inductance and capacitance of 10Ω , 0.1 H and $8 \mu\text{F}$ respectively is
- A) 15 Hz
 - B) 81 Hz
 - C) 1.8 Hz
 - D) 1 Hz
9. A circuit with RLC components, whose transient current is oscillatory when resistance is
- A) $R < 2\sqrt{L/C}$
 - B) $R > 2\sqrt{L/C}$
 - C) $R < \sqrt{L/C}$
 - D) $R = 0$

10. State the graph shown here correspond to which category



- A) Variation on impedance and current in a resistive circuit
 B) Variation on impedance and current in a parallel resonant circuit
 C) Variation on impedance and current in a series resonant circuit
 D) Variation on impedance and current in a capacitive circuit
11. As the temperature increases beyond the curie temperature, the relative susceptibility of ferromagnetic materials
- A) Increase
 B) Remains constant
 C) Becomes zero
 D) Decrease
12. If the area of hysteresis loop of a material is large, the hysteresis losses in the material will be
- A) Zero
 B) Large
 C) Small
 D) Unchanged
13. The total inductance of 2 coils connected in series cumulatively is 1.6 H and connected in differentially is 0.4 H. If the self inductance of one coil is 0.6 H then coupling coefficient will be
- A) 0.612
 B) 1.2
 C) 3
 D) 2.5
14. The induced emf in a magnetically linked coil when its flux is changed from 1 Wb to 0.1 Wb in 0.1 second is
- A) 1 V
 B) 0.09 V
 C) 0.9 V
 D) 9 V

15. The potential at a point due to a charge of $100\ \mu\text{Coulomb}$ at a distance of 9 metres is
 - A) 100 Volts
 - B) 10^5 Volts
 - C) 10^2 Volts
 - D) 1 Volt
16. A circular wire loop has its radius increasing at a rate of 6m/s . The loop is placed perpendicular to a constant magnetic field of 0.4 Wb/m^2 . When radius of the loop is 2m, the emf induced in the loop will be
 - A) 4.8π Volts
 - B) 6π Volts
 - C) 8.8π Volts
 - D) 9.6π Volts
17. What will be the force experienced by the conductor when a current of 50 A flows through the conductor of length 0.5 m placed in a magnetic field of strength 0.5 wb/m^2 ?
 - A) 12.5 N
 - B) 10.5 N
 - C) 1.5 kN
 - D) 0.5 N
18. A circuit carrying a triangular wave having a form factor
 - A) Greater than 1.11
 - B) Less than 1.11
 - C) Equal to 1.11
 - D) Zero
19. The rms value of a half-rectified square wave below is



- A) 10.092 V
B) 7.071 V
C) 8.012 V
D) 5 V

20. The primary objective for making the coil span of a DC armature winding equal to a pole pitch is to
- A) Ensure the addition of emf of consecutive turns
 - B) Obtain a coil span of 180 degree electrical
 - C) Obtain a full pitch winding
 - D) Distribute the winding uniformly under different poles
21. The primary objective of commutating or reversing emf in DC machine is to
- A) Neutralize the reactance voltage
 - B) Neutralize the commutating resistance
 - C) Reduce heat production
 - D) Convert AC to DC
22. Under light load condition a series generator has rising voltage characteristics, but at a high loads the voltage starts decreasing due to
- A) Over heating of brushes
 - B) Low cross magnetising effect
 - C) Poor armature field resistance
 - D) Excessive demagnetising effects of armature reaction
23. A 250 V shunt motor with armature resistance of 0.5Ω runs at 600 rpm on full load and takes an armature current of 20 A. If resistance of 1.0Ω is placed in the armature circuit, then the speed at half-full load torque is
- A) 587.5 rpm
 - B) 600 rpm
 - C) 475.3 rpm
 - D) 1200 rpm
24. In a retardation test on a separately excited motor, the induced emf in the armature fall from 220 V to 190 V in 30 seconds on removing the armature from the supply. The same fall take place in 20 seconds if immediately after disconnection the armature is connected to a resistance which takes 10 A during this fall. Then the stray losses of the motor is
- A) 1950 W
 - B) 2750 W
 - C) 3500 W
 - D) 4100 W

25. If the applied voltage of a certain transformer is increased by 50% and the frequency is reduced to 50% the maximum core flux density at secondary side will be
 - A) B_{m1}
 - B) $2B_{m1}$
 - C) $1.5B_{m1}$
 - D) $3B_{m1}$
26. A 3 phase 16 pole alternator has 144 slots, then the distribution factor in the machine is
 - A) 0.959
 - B) 0.84
 - C) 0.8
 - D) 1
27. The eddy current loss of a transformer at 150 V, 60 Hz is 175 W. What will be the eddy current loss is frequency has reduced to 30 Hz at 150 V ?
 - A) 150 W
 - B) 160 W
 - C) 175 W
 - D) 165.5 W
28. A 3- ϕ , 50 Hz, induction motor has a full load speed of 1440 rpm. If the machine is running at this condition, what will be the rotor slip and rotor frequency of the induction motor ?
 - A) 6.5%, 4 Hz
 - B) 4%, 2 Hz
 - C) 7%, 3 Hz
 - D) 5%, 4 Hz
29. An alternator has 18 slots/pole and the first coil lies in slots 1 and 16, then the pitch factor for 3rd harmonics is
 - A) 0.96
 - B) 0.259
 - C) 0.289
 - D) 0.707
30. What type of motor can be permanently coupled with heavy loads ?
 - A) Shunt Motor
 - B) Differentially compound wound Motor
 - C) Series Motor
 - D) Short shunt Motor

31. $(39)_{10}$ in binary systems is
 - A) 110111
 - B) 111001
 - C) 100110
 - D) 100111
32. Which of the following circuits can be used as parallel to serial converter ?
 - A) Multiplexer
 - B) De-multiplexer
 - C) Decoder
 - D) Digital counter
33. Simplifying $(X + Y)(X + \bar{Y})$ we will get
 - A) $X(1 + Y)$
 - B) $X + X\bar{Y}$
 - C) Y
 - D) X
34. How many outputs are there in the output of a 10 bit D/A converter ?
 - A) 1000
 - B) 1023
 - C) 1024
 - D) 1224
35. What is the least change in output voltage of 12 bit binary D/A converter using 12 V reference supply voltage ?
 - A) 0.12
 - B) 0.00293
 - C) 0.0293
 - D) 0.012
36. A 4 bit synchronous counter uses flip-flops with propagation delay time of 15 ns each. The maximum possible time required for change of state will be
 - A) 15 ns
 - B) 30 ns
 - C) 45 ns
 - D) 60 ns

37. How many kilobytes of memory will be able to access a microprocessor with 12 bit address bus ?
 A) 0.4 B) 2 C) 4 D) 10
38. A ring counter is same as
 A) Shift counter
 B) Parallel counter
 C) Up-down counter
 D) None of the above
39. A gate in which all inputs must be high to get a low input is called
 A) NAND B) AND
 C) NOR D) INVERTER
40. In 8085, TRAP is
 A) always maskable
 B) cannot interrupt a service subroutine
 C) used for catastrophic events like temporary power failure
 D) lowest priority interrupt
41. The _____ components consists of three vectors equal in magnitude and phase.
 A) Positive sequence B) Negative sequence
 C) Zero sequence D) None of the above
42. Inductance per phase of three phase transmission line is
 A) $L = 2 \times 10^{-7} \ln \frac{D}{r^2} \text{H / km}$ B) $L = 2 \times 10^{-7} \ln \frac{D}{r} \text{H / km}$
 C) $L = 4 \times 10^{-7} \ln \frac{D}{r'} \text{H / km}$ D) $L = 2 \times 10^{-7} \ln \frac{D}{r'} \text{H / km}$

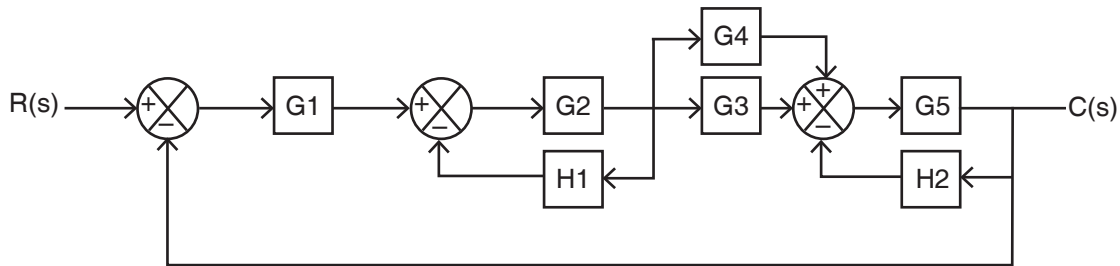
43. If the voltage across each disc insulator in a string is equal then calculate the string efficiency.
- A) 0.75 B) 1 C) 0.5 D) 0.9
44. Which faults are very severe faults ?
- A) Line to ground fault
B) Three phase fault
C) Double line to ground fault
D) Unsymmetrical fault
45. What are the various type of shunt faults ?
- A) Line to ground fault B) One open conductor fault
C) Two open conductor fault D) None of the above
46. Generator emf is 1 p.u. and transient reactance is 25%. Find the transient current.
- A) $4 < 90^\circ$ B) $0.25 < -90^\circ$
C) $5 < -90^\circ$ D) $4 < -90^\circ$
47. Give an expression for Swing Equation.
- A) $M \frac{d^2 \delta}{dt^2} = P_m - P_e$ B) $M \frac{d^2 \delta}{dt^2} = P_m - P_e$
C) $M \frac{d^2 \delta}{dt^2} = P_e - P_m$ D) None of the above
48. If the maximum power $P_{\max} = 50$ MW, find the electrical power output for a torque angle of 60°
- A) 43.3 MW B) 25 MW
C) 32.5 MW D) 86.6 MW
49. In which bus real and reactive components of power are specified ?
- A) infinite bus B) load bus
C) generator bus D) none of the above

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50. In _____ method the convergence is not affected by the choice of slack bus.

- A) Gauss Siedal
- B) Fast Decoupled
- C) Newton Raphson
- D) All of the above

51. Closed loop transfer function $\frac{C(s)}{R(s)}$ of the following system is



- A) $\frac{G1.G2.G3.G4 + G1.G2.G3.G5}{1 + G4.H2 + G2.G5.H1.H2 + G1.G2.G4.G5 + G1.G2}$
- B) $\frac{G1.G2.G3.G4}{1 + G1 + G2.H1 + G3.G4 + G5.H2}$
- C) $\frac{G1.G2.G4.G5 + G1.G2.G3.G5}{1 + G2.H1 + G5.H2 + G2.G5.H1.H2 + G1.G2.G4.G5 + G1.G2.G3.G5}$
- D) None of the above

52. The open loop transfer function with unity feedback is given by $G(s) = \frac{1}{S(S+2)}$, the poles of the closed loop system are located at

- A) (1, 1)
- B) (1, 0)
- C) (-1, -1)
- D) (0, -2)

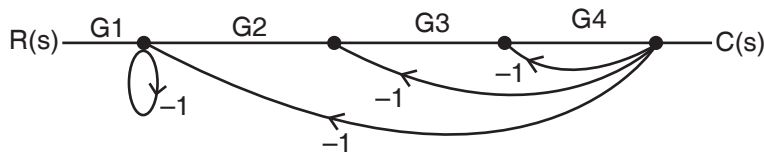
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53. Unit step response of 2nd order system is $1 - e^{-5t} - 5te^{-5t}$. Which of the following statements are correct ?

- i. Impulse response is $10e^{-5t}$.
- ii. Damping ratio is 1.
- iii. Undamped natural frequency is 5rad/sec.

- A) i, ii and iii
- B) ii and iii only
- C) ii only
- D) iii only

54. Closed loop transfer function $\frac{C(s)}{R(s)}$ of the following system is



- A) $\frac{G1.G2.G3.G4}{2 + 2.G4 + 2.G3.G4 + G2.G3.G4}$
- B) $\frac{G1.G2.G3.G4}{1 + G2.G3.G4}$
- C) $\frac{G1.G2.G3.G4}{2 + G1.G2 + G3.G4 + G1.G2.G3.G4}$
- D) $\frac{G1}{1 + G1.G2 + G2.G3 + G3.G4}$

55. Phase margin is the amount of angle to make the system

- A) Oscillatory
- B) Unstable
- C) Stable
- D) Exponential

56. The open loop transfer function of a unity feedback system is given by

$$G(s) = \frac{3e^{-2s}}{s(s+2)}. \text{ The gain crossover frequency in rad/sec is}$$

- A) 0.69 B) 0.75 C) 1.26 D) 1.93

57. Range of 'k' for stability of the unity feedback system with open loop transfer function

$$G(s) = \frac{k}{s(s+1)(s+2)(s+5)} \text{ is}$$

A) $18.32 < k < 25.61$

B) $1.09 < k < 5.32$

C) $11.96 < k < 15.39$

D) $0 < k < 19.69$

58. Consider the following systems

System 1 : $\frac{1}{2s+1}$

System 2 : $\frac{1}{5s+1}$

Which of the following statement is true ?

A) Bandwidth of System 1 is greater than System 2

B) Bandwidth of System 1 is less than System 2

C) Bandwidth of System 1 is equal to System 2

D) Cannot be determined from the above data

59. Condition for stability of a closed loop system with characteristic equation

$$s^3 + bs^2 + cs + 1 = 0 \text{ with positive coefficient is}$$

A) $b = c$

B) $b > c$

C) $b + c > 1$

D) $bc > 1$

60. Consider the following systems

$$\text{System 1 : } \frac{10}{s+1}$$

$$\text{System 2 : } \frac{10}{s+2}$$

Which of the following statement is true ?

- A) System 1 is faster than System 2
- B) System 1 is slower than System 2
- C) System 1 and System 2 have same speed
- D) Cannot be determined from the above data

61. An SCR is rated 450 V, 75 A. How many SCRs are required to be cascaded to form a circuit of 9 kV, 75 A rating ? Let the derating factor is 20%

- A) 20
- B) 21
- C) 25
- D) 30

62. An half controlled single phase bridge rectifier in continuous load current mode is supplying an RL load operating at firing angle α . Fraction of cycle for which the free wheeling diode conduct is

- A) 0.5
- B) $(1 - \alpha)/\pi$
- C) α
- D) α/π

63. A step-up chopper has an input voltage of 100 V and an output voltage of 250 V. The ON time of the chopper is 75 μ s. Time period of the chopper in μ s is

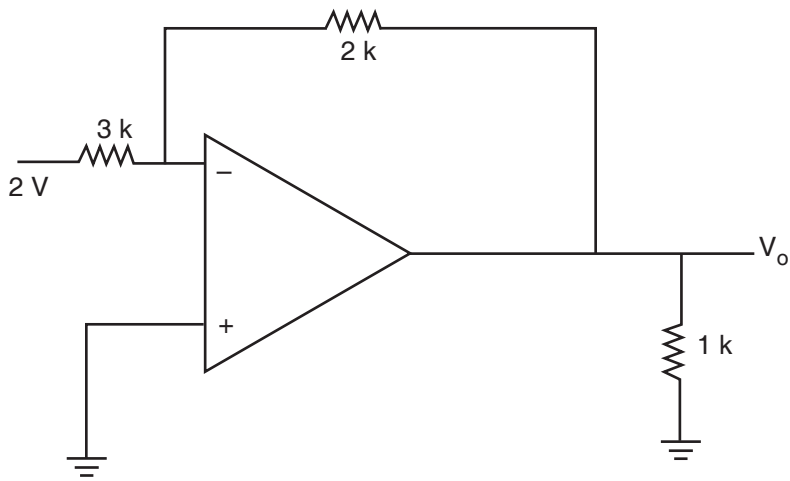
- A) 125
- B) 75
- C) 105
- D) 108

64. A three phase full bridge voltage source inverter delivers power to a star connected resistive load of 10 Ω /phase from a 450 V DC source. RMS value of load current per phase under 180° conduction mode will be

- A) 18.97 A
- B) 21.20 A
- C) 11.35 A
- D) 19.72 A

65. In a thyristor
- A) Holding current is more than Latching current
 - B) Holding current is less than Latching current
 - C) Holding current is equal to Latching current
 - D) Holding current is zero
66. An Op-Amp has an output signal of 2 V for an input of 50 mV. The voltage gain in dB is
- A) 12 dB
 - B) 32 dB
 - C) 19 dB
 - D) 25 dB
67. In response to a square wave input, the output of an Op-Amp changed from -3 V to $+3\text{ V}$ over a time interval of $0.25\text{ }\mu\text{s}$. The slew rate in $\text{V}/\mu\text{s}$ of the Op-Amp will be
- A) 19
 - B) 20
 - C) 22
 - D) 24
68. In single pulse modulation of PWM inverter, 3^{rd} harmonics can be eliminated if the pulse width is
- A) 30°
 - B) 60°
 - C) 90°
 - D) 120°
69. A step down chopper is operated in continuous conduction mode in steady state with a constant duty ratio 'D'. The relation between output voltage V_o and input voltage V_{in} , $\frac{V_o}{V_{in}} =$
- A) D
 - B) $1 - D$
 - C) $1/(1 - D)$
 - D) $D/(1 - D)$

70. The magnitude of output voltage V_o of the below circuit is

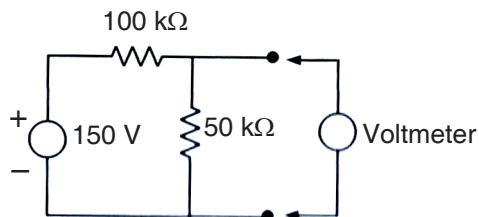


- A) 1.33 V B) 2.66 V
C) 3.99 V D) 0 V

71. The resistance of a circuit is found by measuring the current flowing through and power fed into the circuit. If the limiting error in the measurement of power and current are $\pm 1.5\%$ and $\pm 2.5\%$ respectively, the limiting error in the measurement of resistance will be

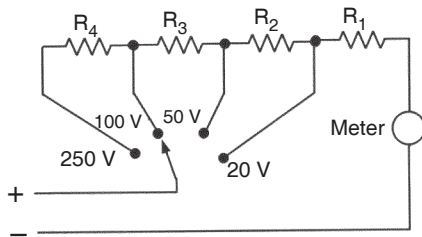
- A) $\pm 6.5\%$ B) $\pm 4\%$
C) $\pm 1\%$ D) $\pm 2\%$

72. A voltmeter with a full-scale range of 0 – 50 V and has a sensitivity of $1\text{k}\Omega/\text{volt}$ is used to measure the potential across a resistive network as shown in the figure below, the % relative error in the measurement will be



- A) 66.66 B) 55.55
C) 33.33 D) 40.00

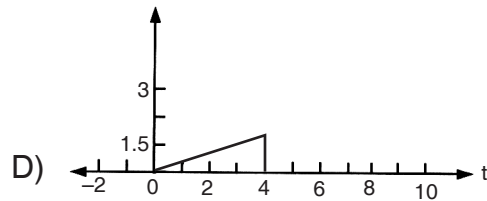
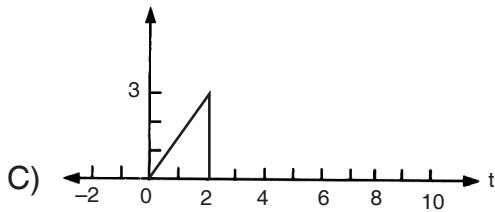
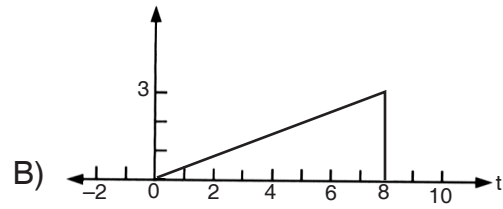
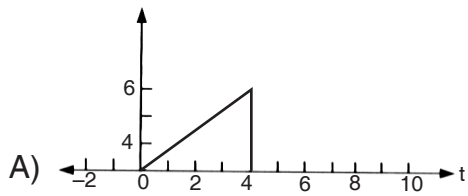
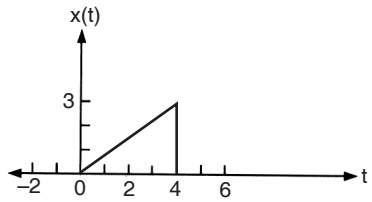
73. A basic D Arsonval movement has full scale current of 1mA and internal resistance of $100\ \Omega$ is used to convert a multirange DC voltmeter with the ranges of 0 – 20 V, 0 – 50 V, 0 – 100 V and 0 – 250 V as shown below. The value of R_1 and R_2 respectively



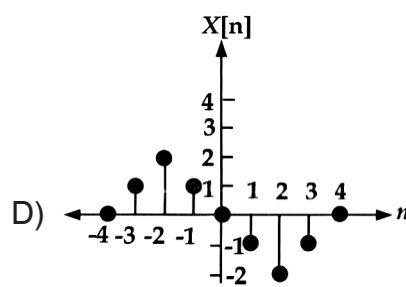
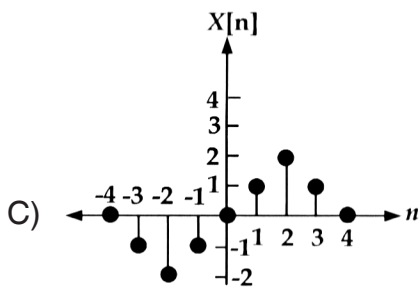
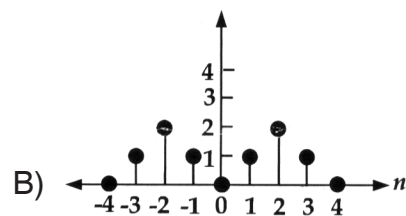
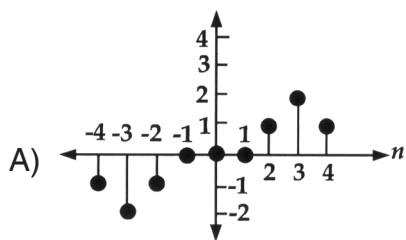
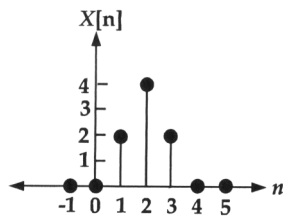
- A) 20 k Ω and 30 k Ω
B) 19.9 k Ω and 30 k Ω
C) 20 k Ω and 29.9 k Ω
D) 19.9 k Ω and 29.9 k Ω
74. Three phase power measurement using two-wattmeter method, the reading of the two wattmeters will be equal and opposite when
- Phase angle is 90° lagging.
 - Phase angle is 0°.
 - Phase angle is 90° leading of these statement.
- A) i, ii and iii are correct
B) ii only correct
C) i only correct
D) i and iii are correct
75. Consider the statements below :
- The compensating coil of a low power factor wattmeter compensates the effect of the power consumed by the pressure coil.
 - The compensating coil of a low power factor wattmeter compensates the effect of power consumed by the current coil.
 - The compensating coil of a low power factor wattmeter compensates the effect of the friction of moving coil.
- A) i and iii are true but ii is false
B) ii is true but i and iii are false
C) i is true but ii and iii are false
D) i and ii are true but iii is false

76. A symmetrical sawtooth wave form has an amplitude of ± 100 V is applied to full wave rectifier type AC voltmeter. The meter reading will be
- A) 70.71 V B) 57.73 V
C) 63.66 V D) 55.50 V
77. If a 0 – 2A moving iron ammeter has an internal resistance of $100\text{ m}\Omega$ and inductance of 0.1 mH. A shunt coil is used to extend its range to 0 – 20 A for all operating frequencies. The time constant in milliseconds and resistance in $\text{m}\Omega$ of the shunt coil respectively are
- A) 1, 5.55 B) 1, 11.11
C) 2, 10 D) 2, 11
78. The current through the moving iron instrument has increased by 30%, what is the percentage increase in the deflection torque ?
- A) 30 B) 50
C) 69 D) 60
79. A single-phase energy meter is measuring the energy consumption of a unity power factor constant load for 2 hours. If the meter disc makes 2300 revolutions for a 230 V, 20 A load current, what will be the meter constant ?
- A) 1000 B) 250
C) 125 D) 500
80. Two in phase 50 Hz sinusoidal wave forms of Peak-to-peak value $\sqrt{2}$ V is fed into the channel-1 and channel-2 respectively of an oscilloscope. If the voltage scale, time scale and other settings are exactly the same for both the channels. What would be observed Lissajous pattern if the oscilloscope is operated in X-Y mode ?
- A) A circle of unit radius
B) An ellipse
C) A circle of two unit radius
D) A straight line inclined at 45° with respect to the x axis

81. A continuous time signal $x(t)$ is shown below $x(t/2)$ is



82. Odd component of given discrete time signal $X[n]$ is



83. If P and E are the average power and energy of continuous or discrete time signal, then energy signal is
 - A) $0 < E < \infty$, $P = 0$
 - B) $0 < E < \infty$, $P = \infty$
 - C) $0 < P < \infty$, $E = \infty$
 - D) $0 < P < \infty$, $E = 0$
84. For a continuous time system described by $y(t) = x(t/2)$ is
 - A) Causal, stable and time varying
 - B) Linear and time-invariant
 - C) Linear and causal
 - D) Linear and stable
85. Let $x(t) = \cos(t)$ and $x(t)$ is continuous at $t = 0$, then $x(t) \delta(t - \pi)$ is
 - A) -1
 - B) 0
 - C) $\cos(\pi) \delta(t)$
 - D) $-\delta(t - \pi)$
86. The fundamental period of a discrete signal $x[n] = e^{j\frac{\pi}{2}n}$
 - A) $1/4$ s
 - B) 4 s
 - C) 8 s
 - D) $1/8$ s
87. The response of LTI continuous time system to the unit step input is given by $\frac{1}{3}(1 - e^{-3t})$, then the impulse response of the system is
 - A) $\frac{1}{3}(1 - e^{-3t})$
 - B) e^{-3t}
 - C) $1 - e^{-3t}$
 - D) Constant
88. The impulse response $h(t)$ of a LTI continuous time system is described by $h(t) = e^{\alpha t}u(t) + e^{\beta t}u(-t)$ where $u(t)$ denotes the unit step function, α and β are real constants. This system is stable if
 - A) Both α and β are positive
 - B) Both α and β are negative
 - C) α is positive and β is negative
 - D) α is negative and β is positive
89. Consider the signal $x(t) = \sin(3\pi t) + \sin(6\pi t)$, the minimum sampling interval to satisfy the Shannon's sampling rule is
 - A) $1/6$ s
 - B) $1/3$ s
 - C) 12 s
 - D) 36 s

90. Let $x(t) = 2u(t)$ and $y(t) = u(t)$, then $x(t) * y(t)$ is
 A) $2u(t)$ B) $2e^{-t}u(t)$ C) $2tu(t)$ D) $2u(t^2)$
91. The table below show the combinations of signal conditioning circuits of the different types of transducers, out of these, the correct combinations are

Transducer	Signal conditioning circuit
P. Piezoelectric	Charge amplifier
Q. Strain gauge	Phase sensitive detector
R. Thermocouple	Cold junction compensation
S. L.V.D.T.	AC Bridge

- A) P, R and S B) R only C) P and R D) All are correct
92. A resistance wire strain gauge with a gauge factor of 2 is bonded to a steel structural member subjected to a stress of 150 MN/m^2 . The modulus of elasticity of steel is 200 GN/m^2 . The change in the value of gauge resistance due to the applied stress will be
 A) 0.15% B) 0.10% C) 0.05% D) 0.20%
93. A suitable value of a fixed resistance is usually connected across a thermistor is to
 A) Increase the sensitivity B) Improve the linearity
 C) Decrease its resistance D) Compensate its self-heating effect
94. Hall sensor is used to measure
 A) Position of shaft B) Angular velocity
 C) Strength of magnetic field D) All the above
95. The electrolyte of nickel-cadmium rechargeable cells is a mixture of
 A) Potassium chloride and deionized water
 B) Cadmium chloride and deionized water
 C) Cadmium peroxide and deionized water
 D) Potassium hydroxide and deionized water

96. Which of the following arrangement will get the maximum current in a $3\ \Omega$ resistor in the case of 24 cells, each has internal resistance of $2\ \Omega$?
- A) 12 cells in series with 2 rows in parallel
 B) 3 cells in series with 8 rows in parallel
 C) 6 cells in series with 4 rows in parallel
 D) 4 cells in series with 6 rows in parallel
97. According to the Bureau of Indian Standards, the minimum vertical clearance of low and medium voltage lines from the building shall be
- A) 1.2 m
 B) 5.5 m
 C) 2.0 m
 D) 2.5 m
98. The minimum size of copper plate electrode used for earthing should be
- A) $1200\text{ mm} \times 1200\text{ mm} \times 3.5\text{ mm}$
 B) $500\text{ mm} \times 500\text{ mm} \times 6.3\text{ mm}$
 C) $600\text{ mm} \times 600\text{ mm} \times 3.15\text{ mm}$
 D) $600\text{ mm} \times 600\text{ mm} \times 6.3\text{ mm}$
99. A lamp emitting light uniformly in all directions has a mean spherical candle power of 25. What will be the total luminous flux radiated by the lamp in all directions ?
- A) 314 Lumens B) 31.4 Lumens C) 157 Lumens D) 15.7 Lumens
100. Correct combinations given in the table is

Column I	Column II
P. Luminous Flux	Lumen
Q. Luminous intensity	Candle power $\times$ Solid angle
R. Lumen	Candela
S. Lux	Lumen/m ²

- A) P, Q, R and S B) P, Q and S C) Q, R and S D) P and S

Space for Rough Work

