98. A 250 MW, 50 Hz synchronous machine has an operating load of 125 MW. Load varies by 1% for 1% change in frequency. The load frequency constant parameter in p.u. MW/Hz is

(A) 0.1
(B) 0.01
(C) 0.001
(D) 0.0001

99. In a three unit insulator string, voltage across the lowest unit is 17.5 KV and string efficiency is 84.28%. The total voltage across the string will be equal to

(A) 8.825 KV
(B) 44.25 KV
(C) 88.25 KV
(D) 442.5 KV

100. Compared to Gauss-Seidel load flow method, Newton Raphson method takes

(A) Less number of iterations and more time per iteration
(B) Less number of iterations and less time per iteration
(C) More number of iterations and more time per iteration
(D) More number of iterations and less time per iteration

101. For lines of voltages exceeding 650 V and upto 11 kV, the horizontal clearance between the nearest conductor and any part of building shall **not** be less than

(A) 3.7 meter
(B) 2.0 meter
(C) 1.2 meter
(D) 0.5 meter

102. Two lamp posts are 14 m apart and are fitted with lamps of 200 candle power each at a height of 5 m above the ground. The illumination on the ground midway between the lamps will be

(A) 8.3 lux
(B) 3.14 lux
(C) 11.44 lux
(D) 5.24 lux

103. Which of the following is **not** true about the effects of poor power factor ?

(A) For the same load delivery, the required size of the generator and transformer increases
(B) Cross sectional area of busbar needs to be enlarged for same power delivery
(C) Copper losses in the supply network decreases
(D) The overall cost of power delivery increases

104. Incandescent lamps usually have power factor in the range of

(A) 0.98 to 1
(B) 0.6 to 0.8
(C) 0.4 to 0.5
(D) 0.55 to 0.75

105. The radiant energy emitted by materials follows

(A) Hooke's Law
(B) Ohm's Law
(C) Wien's Displacement Law
(D) Stefan-Boltzmann's Law

[P.T.O.

57. When a transformer is switched on to supply, an initial transient current (very short duration current) of high magnitude may flow through the primary winding. This transient inrush current may be as high as
   (A) 2 to 5 times the rated current
   (B) 5 to 10 times the rated current
   (C) 10 to 20 times the rated current
   (D) None of the above

58. In the testing of single-phase induction motor, under blocked rotor condition, motor speed is zero. so the slip will be
   (A) less than 1
   (B) equal to 1
   (C) greater than 1
   (D) zero

59. In 3-phase induction motor, the rotor speed is always slightly less than synchronous speed so as to produce a _____ in the rotor bars sufficiently large enough to overcome the braking torque.
   (A) Voltage
   (B) Current
   (C) Torque
   (D) Force

60. Dummy coils are used so as
   (A) to make the armature dynamically balanced
   (B) to contribute to the induced emf
   (C) to contribute to the developed torque
   (D) to reduce the current

61. If $x(t) \leftrightarrow X(f)$ represents a Fourier transform pair, then according to the duality property of Fourier transform
   (A) $X(t) \leftrightarrow x(-f)$
   (B) $X(t) \leftrightarrow x*(-f)$
   (C) $X(t) \leftrightarrow x(f)$
   (D) $X(t) \leftrightarrow x*(f)$

62. The z transform of $x[n] = nu[n]$, where $u[n]$ is a step function
   (A) $\dfrac{z}{(z-1)}$
   (B) $\dfrac{z}{(z-1)^2}$
   (C) $\dfrac{z^2}{(z-1)}$
   (D) $\dfrac{z}{\left(z-\dfrac{1}{2}\right)^2}$

63. The Sampling frequency of the signal $x(t) = \sin C^2(200t)$ is
   (A) 100 Hz
   (B) 200 Hz
   (C) 400 Hz
   (D) 800 Hz

64. Which of the following property of the Laplace transform is **not** correct ?
   (A) $e^{-at}x(t) \xleftarrow{LT} X(s+a)$
   (B) $x_1(t)*x_2(t) \xleftarrow{LT} X_1(s)\, X_2(s)$
   (C) $x_1(t)x_2(t) \xleftarrow{LT} \dfrac{1}{2\pi J}[X_1(s)*X_2(s)]$
   (D) $x(at) \xleftarrow{LT} aX\left[\dfrac{s}{a}\right]$

83. Which of the following term is responsible for noise measurement in PID controller ?
    (A) The integral term
    (B) Both proportional – integral
    (C) The proportional term
    (D) The derivative term

84. Write the expression for transfer function in frequency domain of the following Figure. The bode magnitude plot of a system
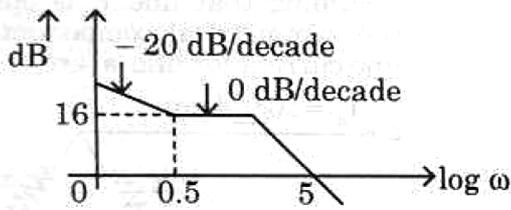


(A) $\dfrac{3(1+j\omega)}{(j\omega)\,(1+j0.2\omega)}$

(B) $\dfrac{(1+j3\omega)}{(j\omega)\,(1+j0.2\omega)}$

(C) $\dfrac{3(1+j2\omega)}{(j\omega)\,(1+j0.2\omega)}$

(D) $\dfrac{2(1+j3\omega)}{(j\omega)\,(1+j0.2\omega)}$

85. To increase the damping factor of the dominant poles of a conventional control systems, name the controller which provides advantage of combing it with derivative error scheme.
    (A) PI
    (B) PID
    (C) P
    (D) None of the above

86. A stepper motor has a step angle of 1.8°. How many steps are required for one complete revolution ?
    (A) 100
    (B) 200
    (C) 360
    (D) 180

87. Which motor is used commonly in vacuum cleaner ?
    (A) Stepper motor
    (B) Single-phase induction motor
    (C) Three-phase induction motor
    (D) Universal

88. A mercury vapour lamp at low mercury vapour pressure gives
    (A) White light
    (B) Pink light
    (C) Yellow light
    (D) Blue light

89. In flat rate tariff, bill depends only on
    (A) Power factor
    (B) Maximum energy demand
    (C) Actual energy consumed
    (D) Active power
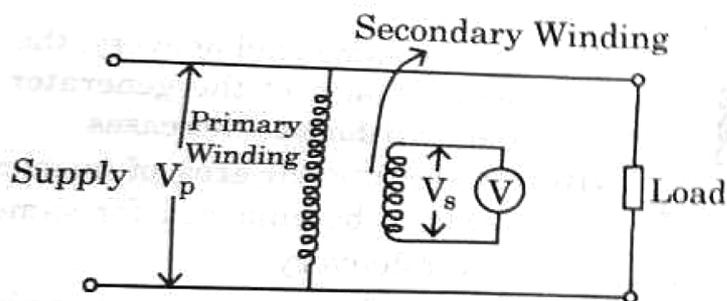
90. The maximum value of 'demand factor' is
    (A) 2
    (B) 1
    (C) 0
    (D) –2

**106.** The diagram given below represents the basic principle of
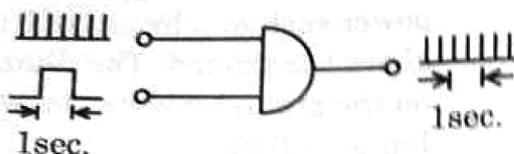


(A) Digital phase measurement
(B) Digital time measurement
(C) Digital frequency measurement
(D) Digital power measurement

**107.** Which type of transformer is represented by the circuit diagram given below ?



(A) Current transformer
(B) Potential transformer
(C) Power transformer
(D) Energy transformer

**108.** The Schering bridge is used to measure
(A) Inductance and Q factor
(B) Capacitance and frequency
(C) Capacitance at resonant frequency
(D) Capacitance and dielectric loss

**109.** An instrument used for measuring the power in any of the given electrical network is
(A) Meggar
(B) Gyrometer
(C) Wattmeter
(D) Energymeter

**110.** The testing method of an energy meter that avoids the actual loading arrangements when the current rating of a meter is high is called
(A) Creep test
(B) Starting test
(C) Phantom loading
(D) Induction test

**111.** The reverse recovery time and peak inverse current in a diode depends upon
(A) Forward diode current
(B) Stored charge
(C) Temperature
(D) Peak inverse voltage

**112.** In Gate Turn-off Thyristor (GTO), during turn-off process, the anode current begins to fall when the gate current
(A) just begins to become negative at time $t = 0$
(B) is negative peak at time $t = 0$
(C) is negative at time $t = t_S$ (Storage period)
(D) is negative peak at time $t = t_S + t_f$ (Fall period)

**113.** In V-I characteristics of an Uni Junction Transistor (UJT), negative resistance region exhibits
(A) After valley point
(B) Between peak point and valley point
(C) Before the peak point
(D) None of the above

**114.** A pulse transformer is used in a triggering circuit

- (A) To prevent a false triggering
- (B) To provide isolation of low voltage gate circuit from high voltage anode-cathode circuit
- (C) Low frequency carrier gating
- (D) To trigger only one device

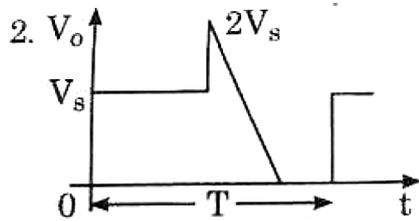**115.** Match the List – I with List – II and give the correct answer by using the codes given below.
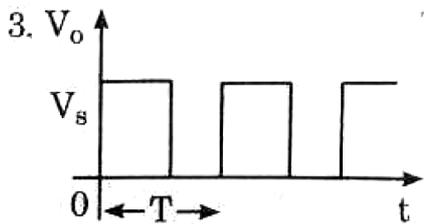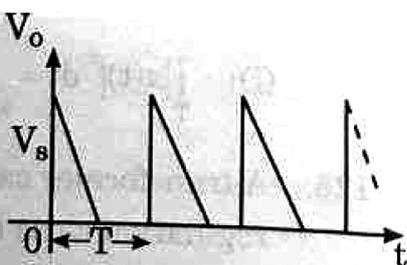
List – I
List – II

a. Voltage commutated chopper   1. $V_s$
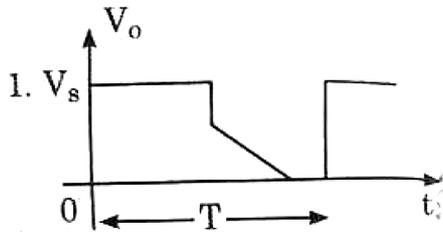


b. Load commutated chopper   2. $V_o$   $2V_s$



c. Current commutated chopper   3. $V_o$



d. Conventional chopper   4. $V_o$



Codes :
- (A) a – 2, b – 4, c – 1, d – 3
- (B) a – 2, b – 4, c – 3, d – 1
- (C) a – 4, b – 2, c – 1, d – 3
- (D) a – 2, b – 1, c – 4, d – 3

**116.** The electric flux density (D) is related to the electric field intensity (E) as

- (A) $D = \dfrac{E}{\varepsilon_0}$
- (B) $D = \dfrac{\varepsilon_0}{E}$
- (C) $D = \varepsilon_0 E$
- (D) $D = \dfrac{1}{\varepsilon_0 E}$

**117.** Which of the following is **not** correct according to Coulomb's law regarding the force between two point charges ?

- (A) It acts along the line joining the two charges
- (B) It acts perpendicular to the line joining the two charges
- (C) It is directly proportional to the product of the two charges
- (D) It is inversely proportional to the square of the distance between the charges

**118.** Gauss's law states that the total electric flux through any closed surface is equal to the

- (A) Voltage enclosed by the surface
- (B) Current enclosed by the surface
- (C) Energy enclosed by the surface
- (D) Charge enclosed by the surface

[ P.T.O.

91. The ability of a material to store electrical energy in an electric field depends upon
    (A) Relative conductivity
    (B) Relative permeability
    (C) Relative permittivity
    (D) Relative resistivity

92. Biot-Savart's Law is used to determine the
    (A) Electric field due to a point charge
    (B) Magnetic field due to a current carrying conductor
    (C) Force between two static charges
    (D) Force on a moving charge in an electrical field

93. The Lorentz force on a moving charged particle is due to presence of following
    (A) Gravitation fields
    (B) Irrotation fields
    (C) Both Electric and Magnetic fields
    (D) None of the above

94. Reluctance in a magnetic circuit is analogous to electric circuit. Suggest from the following.
    (A) Current (I)
    (B) Resistance (R)
    (C) Voltage (V)
    (D) Conductance (G)

95. Magnetomotive force (mmf) in a magnetic circuit is analogous to an electric circuit. Suggest from the following.
    (A) Current (I)
    (B) Resistance (R)
    (C) Voltage (V)
    (D) Field Intensity (E)

96. One conductor of a Three Phase line is open as shown in the circuit below. The current flowing to the Δ–connected load through line 'a' is 10A. With the current in line 'a' as reference and assuming that line 'c' is open, then the symmetrical components of the line current for line 'a' are
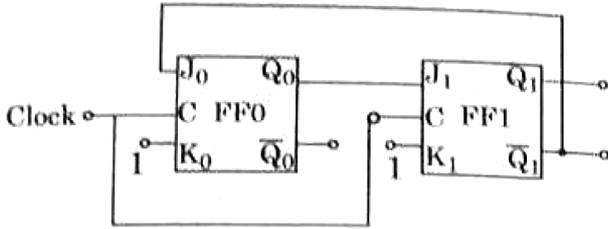


$$I_a = 10\underline{/0°}\,Amp$$

$$I_b = 10\underline{/180°}$$

$$\rightarrow I_c = 0$$
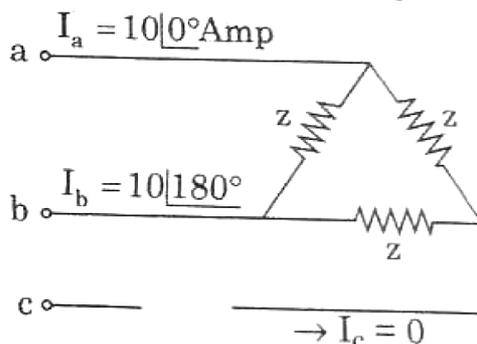
    (A) $I_{a_0} = 0, I_{a_1} = 5.78\underline{/30°}A,$
        $I_{a_2} = 5.78\underline{/-30°}A$
    (B) $I_{a_0} = I_{a_1} = I_{a_2} = 0$
    (C) $I_{a_0} = 0, I_{a_1} = 5.78\underline{/-30°}A,$
        $I_{a_2} = 5.78\underline{/30°}A$
    (D) $I_{a_0} = 5.78\underline{/30°}, I_{a_1} = 5.78\underline{/-30°},$
        $I_{a_2} = 0$

97. The pin type insulators are normally used upto a voltage of
    (A) 33 KV
    (B) 132 KV
    (C) 220 KV
    (D) 400 KV
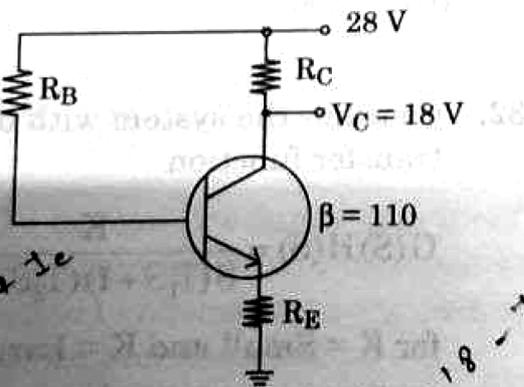
**72.** The circuit given below is which counter ?



(A) Mod-2 counter

(B) Mod-7 counter

(C) Mod-4 counter

(D) Mod-3 counter

**73.** For the Emitter-bias configuration shown in figure has the following specifications :

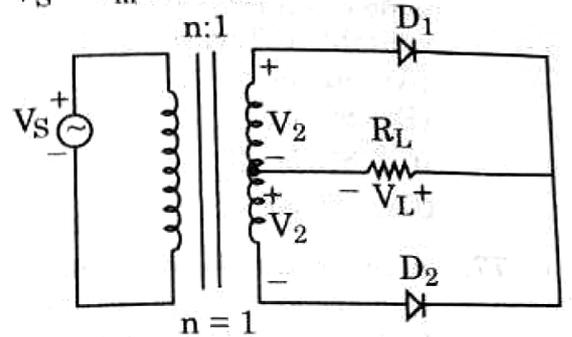$$I_{C_Q} = \frac{1}{2} I_{C_{sat}}, \, I_{C_{sat}} = 8 \text{ mA}, \, V_C = 18 \text{ V}$$

and $\beta = 110$. The value of $R_C$ is
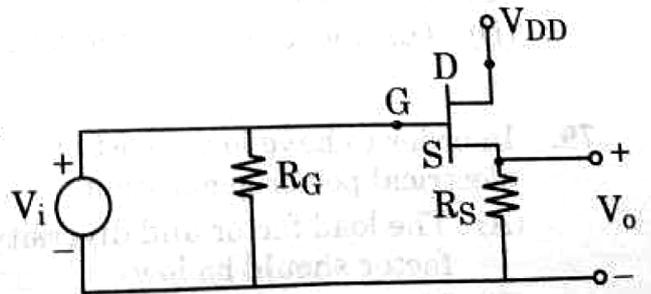


(A) 3.5 kΩ

(B) 1 kΩ

(C) 2 kΩ

(D) 2.5 kΩ

**74.** What is the average value of output voltage $V_L$ for the full wave rectifier power supply shown in figure if $V_S = V_m \sin \omega t$ ?



(A) $\dfrac{2V_m}{n\pi}$

(B) $\dfrac{V_m}{n\pi}$

(C) $\dfrac{V_m}{2n\pi}$

(D) $\dfrac{V_m}{2\pi}$

**75.** For a common drain amplifier as shown in figure, $R_G = 500$ kΩ, $R_S = 5$ kΩ, $\mu = 60$ and $r_{dS} = 30$ kΩ, the value of voltage gain $A_V$ is



(A) 0.795

(B) 0.995

(C) 0.695

(D) 0.895

[ P.T.O.

76. A 3-phase transformer rated for 33KV/6.6KV is connected in star/delta is to be protected by a differential protection. The current transformer on the low voltage side has a ratio of 400/5. Then the suitable C.T. ratio on the HV side is
(A) $80 : 5$
(B) $80 : 5\sqrt{3}$
(C) $80 : 5/\sqrt{3}$
(D) $160 : 5/\sqrt{3}$

77. A generator is connected to a synchronous motor. From stability point of view it is preferable to have
(A) Generator neutral reactance grounded and motor neutral resistance grounded
(B) Generator and motor neutrals resistance grounded
(C) Generator and motor neutrals reactance grounded
(D) Generator neutral resistance and motor neutral reactance grounded

78. Load frequency control is achieved by properly matching the individual machine's
(A) Reactive powers
(B) Generated voltages
(C) Turbine inputs
(D) Turbine and generator ratings

79. In order to have lower cost of electrical power generation
(A) The load factor and diversity factor should be low
(B) The load factor should be low but diversity factor should be high
(C) The load factor should be high but diversity factor should be low
(D) The load factor and diversity factor should be high

80. The main criterion for designing the cross section of conductor used for a distributor is
(A) Voltage drop
(B) Corona loss
(C) Temperature rise
(D) Radio interference

81. The Routh array given below

$$
\begin{array}{c|cc}
s^3 & 1 & K + 200 \\
s^2 & 3 & 4K \\
s^1 & \dfrac{600 - K}{3} & \\
s^0 & 4K &
\end{array}
$$

For marginally stable, the value of oscillation frequency is
(A) $\sqrt{500}$
(B) $\sqrt{200}$
(C) $\sqrt{600}$
(D) $\sqrt{800}$

82. Consider the system with open-loop transfer function

$$G(S)H(S) = \frac{K}{S(T_1 S + 1)(T_2 S + 1)}$$

for K = Small and K = Large, the system is respectively
(A) stable, stable
(B) unstable, stable
(C) stable, unstable
(D) unstable, unstable

65. What is the final value $x(\infty)$ if $X(s)$ is given by $X(s) = \dfrac{s-2}{s(s+4)}$ ?

   (A) $-\dfrac{1}{2}$

   (B) $\dfrac{1}{2}$

   (C) 0

   (D) 4

66. A dc chopper, in which load current remains positive but output voltage may be positive or negative is known as (assume current on X – axis)
   (A) Type – C chopper
   (B) Type – A chopper
   (C) Type – B chopper
   (D) Type – D chopper

67. A single-phase fully controlled converter operates as an inverter when firing angle 'α' varies from
   (A) $0° \leq \alpha \leq 90°$
   (B) $90° \leq \alpha \leq 180°$
   (C) $90° \leq \alpha \leq 180°$ and there is a suitable dc source in the load circuit
   (D) $0° \leq \alpha \leq 60°$

68. In a dual converter, the flow of circulating current
   (A) Allows the continuous conduction with slower response time
   (B) Allows the continuous conduction with faster response time
   (C) Does not allow the continuous conduction with sluggish response time
   (D) Allows to operate converter – I as a rectifier and converter – II as an inverter but reverse power flow is not possible

69. A single phase dual converter is feeding a separately excited dc motor in four quadrant operation
  1. For working in first and fourth quadrants, converter – I is operation.
  2. For operation in second and third quadrants, converter – II is energised.
  3. Converter – II with firing angle greater than 90° operates the motor in reverse motoring mode in third quadrant.
   (A) Only 1 and 3
   (B) Only 2 and 3
   (C) Only 1 and 2
   (D) All of the above

70. For stator voltage control of induction motor drive which of the following statements are **not** correct ?
  1. AC voltage controllers are very simple.
  2. AC voltage controllers generates low harmonic content.
  3. AC voltage controllers will have high input power factor.
  4. Stator voltage can be varied by three phase voltage fed variable DC link inverters.
   (A) 1 and 2
   (B) 2 and 3
   (C) 3 and 4
   (D) 1 and 4

71. Simplify the boolean expression
$$f = \overline{A} \cdot \overline{B} \cdot \overline{C} \cdot \overline{D} + \overline{A} \cdot \overline{B} \cdot \overline{C} \cdot D + A \cdot \overline{B} \cdot \overline{C} \cdot \overline{D} + A \cdot \overline{B} \cdot \overline{C} \cdot \overline{D}$$
   (A) $\overline{B} \cdot \overline{C}$
   (B) $\overline{B} \cdot C$
   (C) $B \cdot \overline{C}$
   (D) $B \cdot C$

**133.** Find the steady state voltage across the capacitor as well as $R_L$ (in figure). If the current source is removed at $t = 0$.
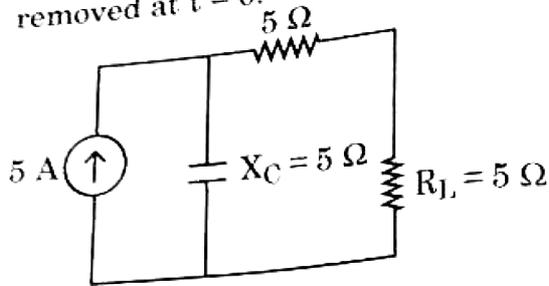


(A) Steady state voltage across $X_C$ is 1 volt

(B) Steady state voltage across $X_C$ is 0 volt

(C) Steady state voltage across $X_C$ is −1 volt

(D) None of the above

**134.** In a series R-L-C circuit R = 2 kΩ, L = 1 H, $C = \dfrac{1}{400}$ μF. The resonance frequency is

(A) $2 \times 10^4$ Hz

(B) $\dfrac{1}{\pi} \times 10^4$ Hz

(C) $10^4$ Hz

(D) $2\pi \times 10^4$ Hz

**135.** A star connected alternator supplies a delta connected load. The impedance of the load branch is (8 + j6) ohm/phase. The line voltage is 230 V. What is the current in the load branch ?
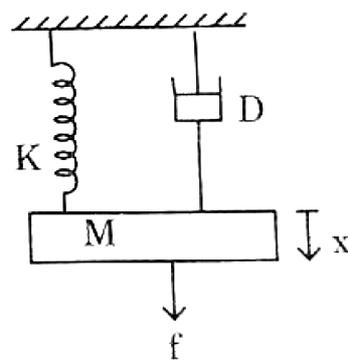
(A) 10 A

(B) 39.8 A

(C) 32 A

(D) 23 A

**136.** The force equation for the system shown in figure is given by
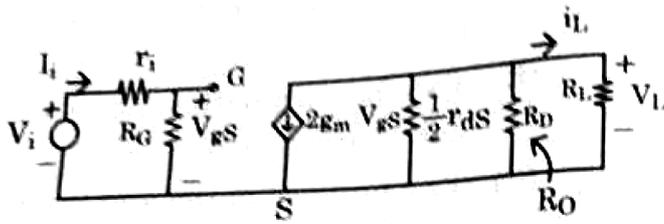


(A) $f = M\dfrac{d^2x}{dt^2} + D\dfrac{dx}{dt} + Kx$

(B) $f + M\dfrac{d^2x}{dt^2} = D\dfrac{dx}{dt} + Kx$

(C) $f + M\dfrac{d^2x}{dt^2} + Kx = D\dfrac{dx}{dt}$

(D) $f = M\dfrac{d^2x}{dt^2} + D\int xdt + Kx$

141. For the small signal equivalent circuit of amplifier shown in figure with $R_S = 3$ kΩ. $R_D = R_L = 2$ kΩ, $r_i = 5$ kΩ and $R_G = 100$ kΩ for identical JFETs with $r_{dS} = 25$ kΩ and $g_m = 0.0025S$. The value of voltage gain is



(A)  6.51

(B)  – 6.51

(C)  – 4.58

(D)  4.58

142. An amplifier has a mid frequency gain $A_0 = 100$. For a feedback ratio $\beta = 0.1$, find the overall gain at mid frequency.

(A)  90.9

(B)  9.09

(C)  9.90

(D)  99

143. The input common mode range is the range of input common voltage over which the input stage remains in

(A) Linear active mode

(B) Linear cut-off mode

(C) Non-linear active mode

(D) Non-linear cut-off mode

144. Assuming that the accumulator contains 14 H and carry bit is set (CY = 1). The instruction ACI 42 H is executed. The content of accumulator will be

(A)  57 H

(B)  42 H

(C)  24 H

(D)  75 H

145. Which of the following interrupts has the highest priority ?

(A)  TF0

(B)  IE0

(C)  TF1

(D)  IE1

146. For the two port network, the impedance parameter matrix

$$[Z] = \begin{bmatrix} Z_{11} & Z_{12} \\ Z_{21} & Z_{22} \end{bmatrix}$$
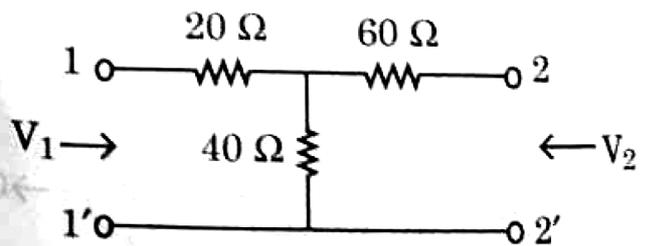


(A)  $\begin{bmatrix} 60\,\Omega & 100\,\Omega \\ 40\,\Omega & 60\,\Omega \end{bmatrix}$

(B)  $\begin{bmatrix} 40\,\Omega & 100\,\Omega \\ 60\,\Omega & 40\,\Omega \end{bmatrix}$

(C)  $\begin{bmatrix} 60\,\Omega & 40\,\Omega \\ 40\,\Omega & 100\,\Omega \end{bmatrix}$

(D)  $\begin{bmatrix} 40\,\Omega & 100\,\Omega \\ 100\,\Omega & 60\,\Omega \end{bmatrix}$

127. What is the another essential condition for three-phase transformers to be connected in parallel, in addition to the conditions of parallel operation of single-phase transformers ?
   (A) Phase sequence should be same only
   (B) Vector grouping should be same only
   (C) Phase sequence and vector grouping should be same
   (D) Neither phase sequence nor vector grouping should be same

128. The advantages of three-phase transformers over the banks of three single-phase transformers are that they
   (A) Occupy less space and cost more
   (B) Occupy more space and cost less
   (C) Occupy less space and cost less
   (D) Occupy more space and cost more

129. Match the following.

| Methods/ Tests | Machines |
|---|---|
| i. Commutation | a. Transformer |
| ii. V-curves | b. Induction motor |
| iii. Circle diagram | c. Synchronous machine |
| iv. Sumpner's test | d. DC motor |

   (A) i – a, ii – b, iii – c, iv – d
   (B) i – b, ii – c, iii – d, iv – a
   (C) i – d, ii – c, iii – b, iv – a
   (D) i – c, ii – b, iii – a, iv – d

130. The Potier method is used to determine the armature reaction ampere-turns and leakage reactance of a
   (A) Induction machine
   (B) Synchronous machine
   (C) DC machine
   (D) Transformer

131. A delta-connected network with its Wye equivalent is shown in figure. The resistances $R_1$, $R_2$, $R_3$ (in ohms) are respectively
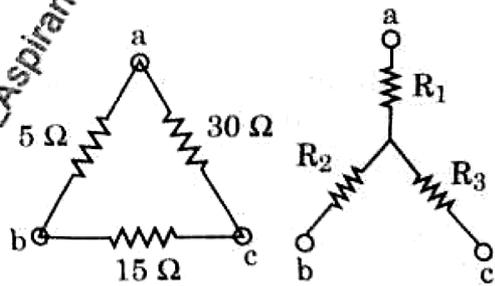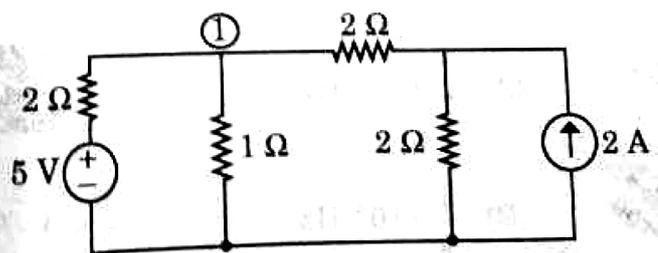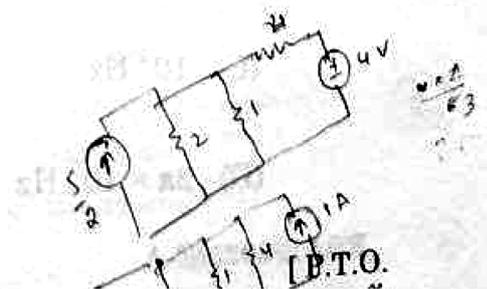


   (A) 1.5, 3 and 9
   (B) 3, 9 and 1.5
   (C) 9, 3 and 1.5
   (D) 3, 1.5 and 9

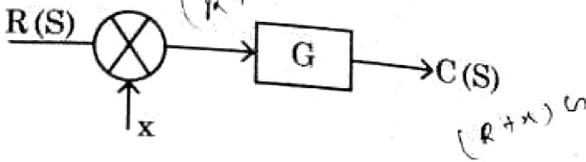132. In the circuit of figure the current in 1 Ω resistor is



   (A) 4 A
   (B) 5 A
   (C) 2 A
   (D) 1 A

[P.T.O.

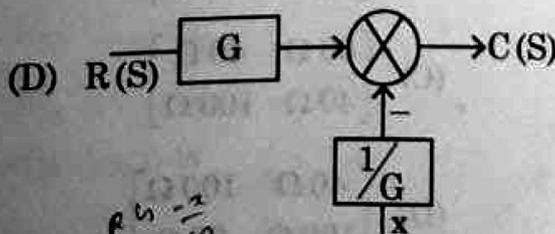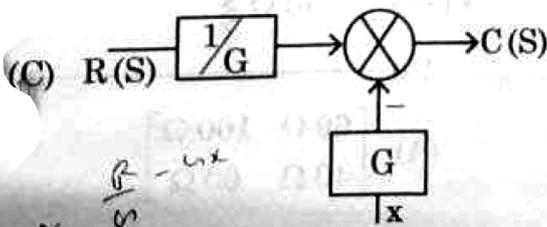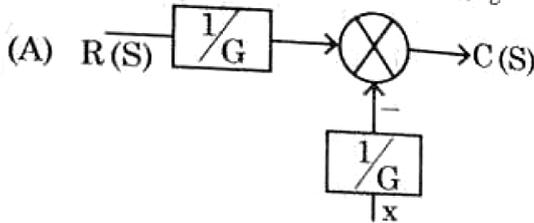@govt_Jobs_Aspiran

**Moving the summing point after the block in the figure**



R(S) → ⊗ → G → C(S)
with input x

**What will be the correct equivalent ?**

(A) R(S) → [1/G] → ⊗ → C(S), with ⊗ fed by [1/G] from x

(B) R(S) → [G] → ⊗ → C(S), with ⊗ fed by [G] from x

(C) R(S) → [1/G] → ⊗ → C(S), with ⊗ fed by [G] from x

(D) R(S) → [G] → ⊗ → C(S), with ⊗ fed by [1/G] from x

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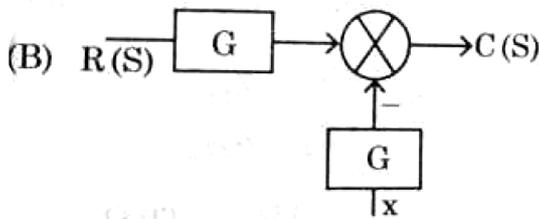
**138.** The signal flow graph shown in the Figure has
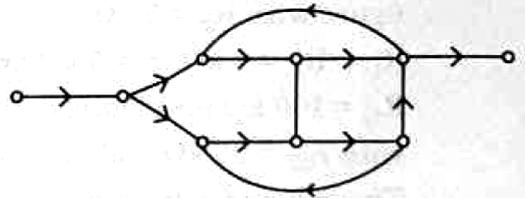


(A) Three forward paths and three loops

(B) Two forward paths and two non-touching loops

(C) Two forward paths and three loops

(D) Three forward paths and two non-touching loops

**139.** The natural frequency of oscillations due to dominant roots of the system transfer function
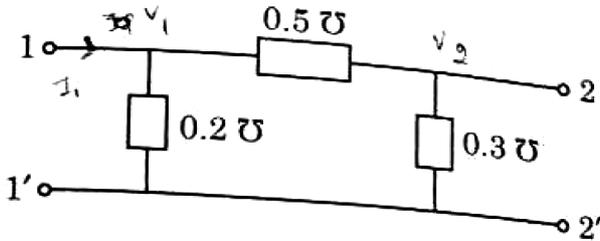
$$\frac{C(S)}{R(S)} = \frac{3}{(S+5)(S^2+2S+3)}$$

(A) 1.73 rad/sec

(B) 2 rad/sec

(C) 1.41 rad/sec

(D) 3 rad/sec

**140.** The stability of a system

(A) Increases as the type of system increases

(B) Decreases as the type of system increases

(C) Does not change as type of system increases

(D) None of the above

[ P.T.O.
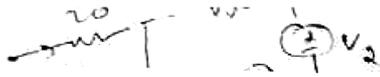
**147.** Which one of the following gives the correct short circuit parameter matrix Y for the network shown ?



(A) $\begin{bmatrix} 0.7 & -0.5 \\ -0.5 & 0.8 \end{bmatrix}$

(B) $\begin{bmatrix} 0.7 & 0.5 \\ -0.5 & 0.8 \end{bmatrix}$

(C) $\begin{bmatrix} 0.8 & -0.5 \\ -0.5 & 0.7 \end{bmatrix}$

(D) $\begin{bmatrix} 0.7 & -0.5 \\ 0.5 & 0.8 \end{bmatrix}$

**148.** A 240 V, 1-$\phi$, ac source is connected to a load with an impedance of $10\angle 60°$ $\Omega$. A capacitor is connected in parallel with the load. If the capacitor supplies 1250 VAR, the real power supplied by the source is

(A) 3600 W

(B) 2880 W

(C) 2400 W

(D) 1200 W

**149.** The voltage across an impedance Z is $100\angle 15°$ V and current through Z is $20\angle -45°$ A. The active and reactive powers in Z respectively are

(A) 1000 W and 1732 VAR

(B) 500 W and 1732 VAR

(C) 1000 W and 6000 VAR

(D) 500 W and 6000 VAR

**150.** A balanced delta-connected load of $(8 + j6)\Omega$ per phase is connected to a 400 V, 50 Hz, 3 phase supply lines. If the input power factor is to be improved to 0.9 by connecting a bank of star connected capacitors, the required KVAR of the bank is

(A) 42.7

(B) 10.2

(C) 28.8

(D) 38.4

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119. The unit of potential difference is
   (A) Volts
   (B) Joules/Coulomb
   (C) Watts
   (D) Both (A) and (B)

120. The capacitance is only function of following, when Electric flux density and electric field intensities are increases
   (A) Magnetic flux density
   (B) Permeability of the medium
   (C) Physical dimension of the system of conductors
   (D) None of the above

121. Which of the following is the example of a discrete-time signal ?
   (A) Voltage across a capacitor
   (B) Sound waves in air
   (C) Temperature recorded at an interval of one hour
   (D) Current flowing through a resistor

122. If x(t) is a continuous time signal then x(2t – 5) represents
   (A) Time scaling by 5 and time shifting by 2
   (B) Time scaling by 2 and time shifting by 5
   (C) Time scaling by 5 and time shifting by ½
   (D) Time scaling by ½ and time shifting by 5

123. Find the correct statement for a unit impulse function in continuous time.
   (A) It has a finite duration
   (B) It has defined only at discrete time instant
   (C) It has infinite area
   (D) It has zero width and infinite height

124. The conditions under which a periodic signal can be represented by a Fourier series are known as
   (A) Parseval conditions
   (B) Nyquist conditions
   (C) Laplace conditions
   (D) Dirichlet conditions

125. Parseval's relation for continuous time periodic signals is

   (A) $\frac{1}{T}\int_T |x(t)|^2 dt = \sum_{k=-\infty}^{\infty} |a_k|$

   (B) $\int_T |x(t)|^2 dt = \sum_{k=-\infty}^{\infty} |a_k|^2$

   (C) $\frac{1}{T}\int_T |x(t)|^2 dt = \sum_{k=-\infty}^{\infty} |a_k|^2$

   (D) $\int_T |x(t)|^2 dt = \sum_{k=-\infty}^{\infty} |a_k|$

126. A transformer can have voltage regulation close to zero
   (A) on full load
   (B) on over load
   (C) on leading power factor
   (D) on zero power factor

# SECTION – B
## ELECTRICAL ENGINEERING

51. The Wheatstone Bridge is used to measure _____ resistance whereas the Kelvin's Bridge is used to measure _____ resistance.
   (A) Low, High
   (B) High, Low
   (C) Medium, Low
   (D) Low, Medium

52. Match the following:

| Bridges | | Advantages |
|---------|--|------------|
| i. | Hay's Bridge | a. A fixed capacitor can be used instead of a variable capacitor. |
| ii. | Anderson's Bridge | b. The bridge can be used over a wide range of measurement of inductances. |
| iii. | Owen's Bridge | c. Simple expression for unknown inductance for high Q coils and Q factor. |

   (A) i – c   ii – a   iii – b
   (B) i – b   ii – a   iii – c
   (C) i – c   ii – b   iii – a
   (D) i – a   ii – c   iii – b

53. The deviation of the true value from the desired value is known as
   (A) Expected value
   (B) Accuracy
   (C) Error
   (D) Precision

54. The expected value of the voltage across a resistor is 75V. However, the measurement gives a value of 74V. The value of absolute error and % error are _____ and _____ respectively.
   (A) 1V, 1.0133
   (B) 0.1V, 1.033
   (C) 1V, 1.33
   (D) 1.01V, 1.33

55. The type of digital voltmeter (DVM) that has better noise rejection capabilities and gives better measurement accuracy (inaccuracy as low as ±0.005%)
   (A) Potentiometric digital voltmeter
   (B) Voltage-to-time conversion digital voltmeter
   (C) Dual-slope integration digital voltmeter
   (D) Voltage-to-frequency conversion digital voltmeter

56. If the ratio of the primary to secondary voltage of an autotransformer is 100 : 50, then what will be the saving in copper by using an autotransformer as compared to a two-winding transformer of the same rating ?
   (A) 25%
   (B) 50%
   (C) 60%
   (D) 75%

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