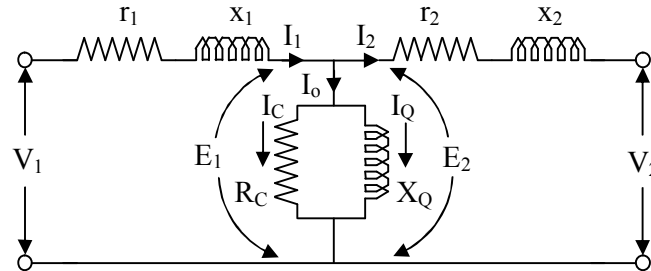1. The exact equivalent circuit of a two winding transformer is given in the figure. For simplification, the parallel magnetising branch, consisting of R_C and X_Q is shifted to the left of the primary leakage impedance ($r_1 + jx_1$). This simplification introduces the inaccuracy, which neglects


   A) Voltage-drop in the primary impedance due to the secondary current
   B) Voltage-drop in the primary impedance due to the exciting current
   C) Voltage-drop in the secondary impedance due to the exciting current
   D) Reduction in values of R_C and X_Q of the exciting circuit

2. Three single phase 11000 V / 220 V transformers are connected to form 3-phase transformer bank. High voltage side is connected in star, and low voltage side is in delta. What are the voltage ratings and turn ratio of 3-phase transformer?
   A) $11000\sqrt{3}$ V / 220 V, 50:1   B) $11000\sqrt{3}$ V / 220 V, $50\sqrt{3}$:1
   C) 11000 V / 381 V, $50\sqrt{3}$:1   D)   11000 V / 220 V, 50:1

3. A single-phase, 10 kVA, 2000/200 V, 50 Hz transformer is connected to form an auto transformer as shown in the figure. 200 V winding has enough insulation to withstand 2000 V. What are the values of V_1 and I_2 respectively?
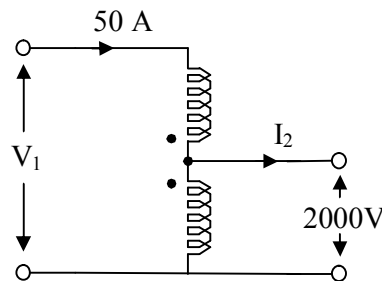

   A) 2200 V, 55 A
   B) 2200 V, 45 A
   C) 2000 V, 45 A
   D) 1800 V, 45 A

4.   Two single phase transformers A and B are connected in parallel as shown in figure, observing all requirements of a parallel operation, except that the induced voltage E_a is slightly greater than E_b due to small difference in turns ratio and / or respective equivalent impedances of A and B. Under this operating condition with the primary bus-bars being energized, a circulating current will flow:
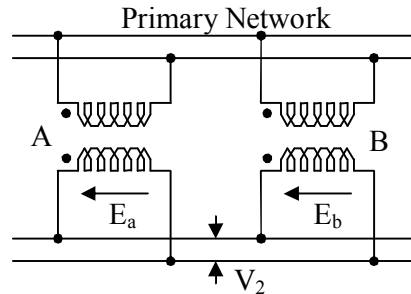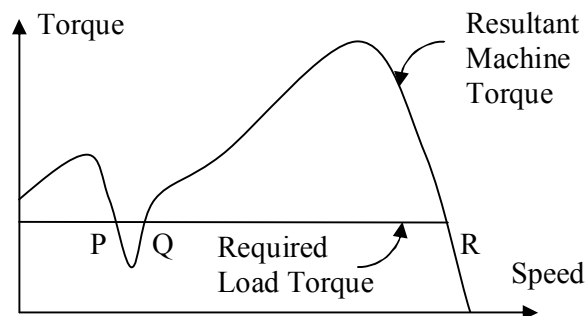

A)   Only in the secondary windings of A and B
B)   In both the primary and the secondary windings of A and B
C)   In both the primary and the secondary windings of A and B, as well as in the primary side network
D)   In the primary and the secondary windings of A and B, and boost the voltages on the secondary side of both A and B

5.   Figure shows a Δ–Y connected 3-phase transformer used to step down the voltage from 11 kV to 415 V line-to-line. It has a SPDT switch connected as shown. Under normal conditions the SPDT switch is kept in S_1 side. Under certain special conditions the SPDT switch position is moved to S_2 side. In such a case the magnitude of the voltage across the LV terminals a and c is
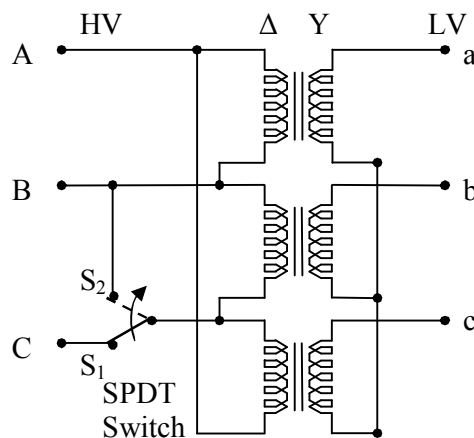

A)   240 V   B)   418 V   C)   0 V   D)   480 V

6.   The armature resistance of a 6-pole simplex lap wound d.c. machine is 0.05 Ω. If the armature is rewound as a wave-winding, what is the armature resistance?
A)   0.45 Ω   B)   0.30 Ω   C)   0.15 Ω   D)   0.10 Ω

7.	In a d.c. compound generator, 'flat-compound' characteristic, required for certain applications, may be obtained by connecting a variable resistance
	A)	Across the series field	B)	In series with the series field
	C)	In parallel with the shunt field	D)	In series with the shunt field

8.	The undesired effect due to armature reaction in d.c. machine is the shifting of magnetic neutral axis (MNA). When there is no compensation provided, which of the following statements is valid.
	A)	The MNA gets shifted in the opposite direction as that of the armature rotation when the machine operates as a generator, and in the same direction as that of armature rotation when the machine operates as motor
	B)	The MNA gets shifted in the same direction as that of the armature rotation when the machine operates either as a generator or as motor
	C)	The MNA gets shifted in the opposite direction as that of the armature rotation when the machine operates either as a generator or as motor
	D)	The MNA gets shifted in the same direction as that of the armature rotation when the machine operates as a generator, and in the opposite direction as that of armature rotation when the machine operates as motor

9.	The stator and the rotor of a 3-phase, 4-pole wound-rotor induction motor are excited, respectively, from a 50 Hz and a 30 Hz source of appropriate voltage. Neglecting all losses, what is/are the possible no-load speed/speeds at which the motor would run?
	A)	1500 rpm and 900 rpm	B)	2400 rpm and 600 rpm
	C)	2400 rpm only	D)	600 rpm only

10.	Which one of the following methods is not suitable for the speed control of squirrel cage induction motors?
	A)	Voltage control	B)	Rotor resistance control
	C)	Frequency control	D)	Pole changing method

11.	In hand-tool applications, which one of the following single phase motors is used?
	A)	Shaded pole motor	B)	Capacitor start motor
	C)	Capacitor run motor	D)	AC series motor

12.	The required load torque line intersects the resultant torque- speed characteristic of a 3-phase squirrel cage induction motor at points P, Q and R as shown in the figure. Which is/are the stable operating point(s)?


	A)	P and Q	B)	Q and R	C)	Only R	D)	P and R

13. Curves X and Y in Figure shown denote open circuit and full-load zero power factor (zpf) characteristics of a synchronous generator. Q is a point on zpf characteristic at 1.0 p.u voltage. The vertical distance PQ in figure gives the voltage drop across

A) Synchronous reactance
B) Magnetising reactance
C) Potier reactance
D) Leakage reactance

14. The phase sequence of a three-phase alternator will reverse if
A) The field current is reversed keeping the direction of rotation same.
B) The field current remains the same but the direction of rotation is reversed
C) The field current is reversed and also the direction of rotation is reversed
D) None of the above

15. For a 1.8^0, 2 phase bipolar stepper motor, the stepping rate is 100 steps per second. The rotational speed of the motor in rpm is
A) 15   B) 30
C) 60   D) 90

16. The circuit shown in figure is connected to a d.c. source of 12V. The value of resistor R_2 to limit the source current to consume 1A is given by

A)   2 Ω   B)   12 Ω   C)   4 Ω   D)   10 Ω

17. The initial capacitor voltage is zero. The switch is closed at $t = 0$. The final steady state voltage across the capacitor in the circuit shown is
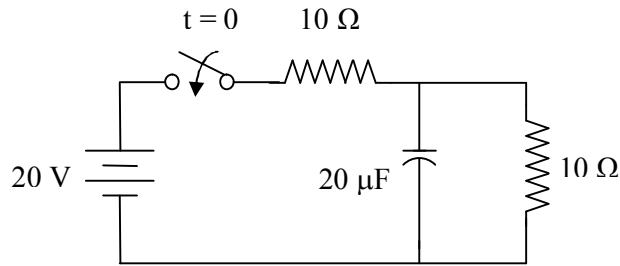
A)   20 V   B)   10 V   C)   5 V   D)   0 V

18. For the 2-port network shown in the figure, what is the value of the parameter Z_{21}?
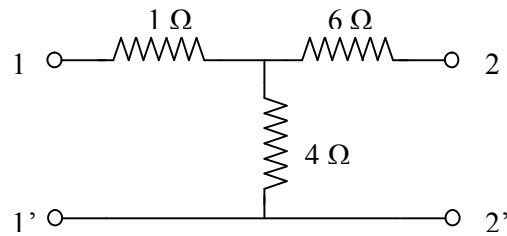
A)   ¼ Ohm   B)   4 Mho   C)   ¼ Mho   D)   4 Ohm

19. A load impedance of R_L+jX_L is connected in series with a network having Thevenin's equivalent impedance of R_S+jX_S. Maximum power will be transferred from the network to the load only when

A) $R_L = R_S$
B) $R_L^2+X_L^2 = R_S^2+X_S^2$
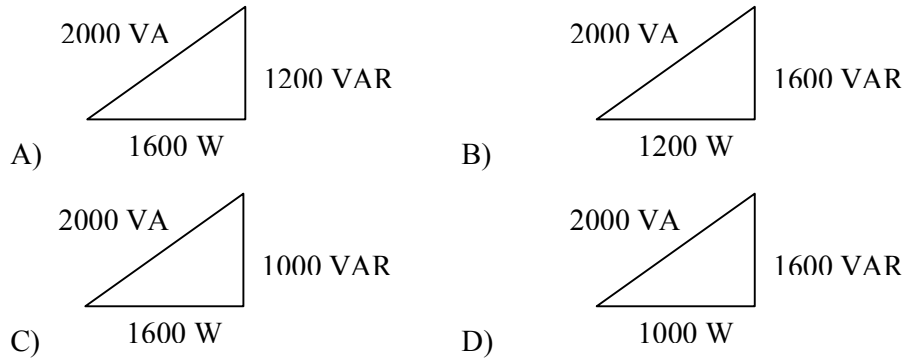C) $R_L+jX_L = R_S+jX_S$
D) $|R_L+jX_L| = |R_S-j\,X_S|$

20. Resonance occurs in RLC series circuit when
A)   When the supply voltage and current are in phase
B)   When inductive reactance become equal to capacitive reactance
C)   When voltage across the inductor become equal to the voltage across the capacitor
D)   All of the above

21. For the network shown in the figure, what is the voltage across the current source, I?
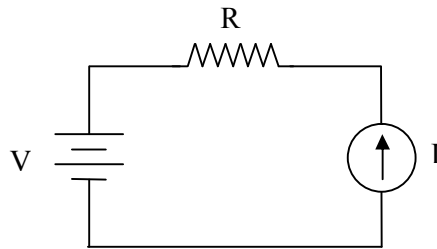
A)   V – RI   B)   V + RI   C)   Zero   D)   RI – V

22. A voltage of $V = 100 \angle 30^0$ is applied to an impedance $Z = 3 + j4\ \Omega$. Which one of the following is the power triangle?

A)
2000 VA
1200 VAR
1600 W

B)
2000 VA
1600 VAR
1200 W

C)
2000 VA
1000 VAR
1600 W

D)
2000 VA
1600 VAR
1000 W

23. Two wattmeter method can be used in a three phase system excited with balanced three phase supply
   A)   To measure real power and power factor in a balanced load
   B)   To measure reactive power in a balanced load
   C)   To measure real power in an unbalanced load
   D)   All of the above

24. Three resistors R_a, R_b and R_c are connected in star across the terminals A, B & C. The star network is to be replaced by an equivalent delta network having resistors R_{ab}, R_{bc} and R_{ca}. The value of element to be connected between A & B in the delta equivalent network is given by
   A) $(R_a R_b + R_b R_c + R_c R_a) / R_c$ B) $(R_a + R_b + R_c) / R_a R_b$
   C) $(R_a R_b) / (R_a + R_b + R_c)$ D)   None of the above

25. Figure shows a thyristor with standard terminations of anode (A), cathode (K), gate (G) and different junctions named J1, J2 and J3. When the thyristor is turned on and conducting

A
P
N
P
N
G
K
J3
J2
J1
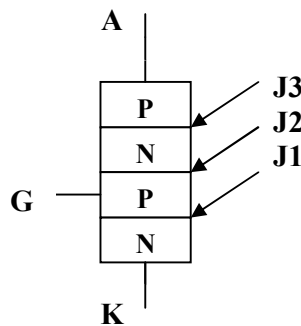
   A)   J1 and J2 are forward biased and J3 is reverse biased
   B)   J1 and J3 are forward biased and J2 is reverse biased
   C)   J1 is forward biased and J2 and J3 are reverse biased
   D)   J1, J2 and J3 are all forward biased

26. The variation of drain current with gate-to-source voltage ($I_D - V_{GS}$ characteristics) of a MOSFET is shown in Figure. The MOSFET is
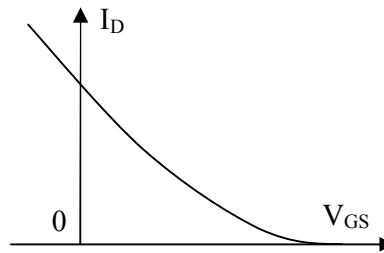
A) n-channel depletion mode device
B) n-channel enhancement mode device
C) p-channel depletion mode device
D) p-channel enhancement mode device

27. Consider the following statements in respect of important features of IGBT.
P. It has high input impedance gate as that of a MOSFET
Q. It has low ON state voltage drop as that of a BJT
R. Turn-off time is significantly less than MOSFET
Which of these statements are correct?

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

28. A half-controlled bridge converter is operating from an input voltage of 120 V r.m.s. Neglecting the voltage drops, what are the mean load voltage at a firing delay angle of 0^0 and 180^0, respectively?
A) $120 * 2\sqrt{2} / \pi$ Volts and 0 Volts
B) 0 Volts and $120 * 2\sqrt{2} / \pi$ Volts
C) $120 \sqrt{2} / \pi$ Volts and 0 Volts
D) 0 Volts and $120 \, 2\sqrt{2} / \pi$ Volts

29. In a three phase voltage source inverter operating in square wave mode, the output line voltage is free from
A) 13th harmonic
B) 7th harmonic
C) 11th harmonic
D) 3rd harmonic

30. In a dual converter, the circulating current
A) Allows smooth reversal of load current, but increases the response time
B) Allows smooth reversal of load current with improved speed of response
C) Does not allow smooth reversal of load current, but reduces the response time
D) Flows if there is no interconnecting inductor

31. Comparing to constant frequency PWM, variable frequency control is not preferred for chopper drives. Because
    A) Wide range of frequency variation is required for the control of duty cycle
    B) Large off time make create the load current discontinuous
    C) Introduce wide spectrum of harmonics and possibility of interference with communication lines
    D) All the above

32. The rotor winding of a three phase wound rotor induction motor is equipped with a three phase diode rectifier connected to the slip rings and rectifier output is connected with chopper drive. Compared to conventional rotor resistance control scheme, the chopper controlled method
    A) Enhances the motor rating
    B) Maintains the motor rating as such
    C) Derates the motor
    D) None of the above

33. The poor power factor operation of variable speed d.c. drives for high-power application can be improved by employing forced commutated converters with
    A) Extinction angle control
    B) Symmetrical angle control
    C) Pulse-width modulation control
    D) All the above

34. Electrical isolation circuit is required between power electronic devices and its gated-pulse generating circuit. The following are the possible ways of providing isolation.
    P. Pulse transformer
    Q. Optical isolators
    R. Electro-mechanical relay
    S. Capacitive coupling
    The effective way of accomplishing isolation is by providing

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

35. Equivalent π model is quite suitable for analyzing the performance of transmission line of
    A) 50 km length   B) 150 km length
    C) 250 km length   D) All of the above lengths

36. A generating station which has a high investment cost and low operating cost is usually operated as
    A) Peak load station   B) Spinning reserve station
    C) Base load station   D) None of the above

8

37. Buses for load flow studies are classified as: (i) Load bus (ii) Generator bus and (iii) Slack Bus. Which one of the following is the correct combination of the pair of quantities specified having their usual meaning for different buses?

|	Load bus	Generator bus	Slack bus
A)	P, $|v|$	P, Q	P, δ
B)	$|v|$, Q	P, δ	P, Q
C)	P, δ	Q, $|v|$	Q, δ
D)	P, Q	P, $|v|$	$|v|$, δ

38. A Buchholz relay is used for:
    A)   Protection of a transformer against all internal faults
    B)   Protection of a transformer against external faults
    C)   Protection of a transformer against both internal and external faults
    D)   Protection of instrument transformers and bus bars

39. A power station's plant capacity factor is defined as the ratio of
    A)   The energy generated to that of maximum energy that could have been generated
    B)   Average load to peak load
    C)   Minimum load to peak load
    D)   Minimum load to average load

40. Power angle curve for operating a synchronous generator with infinite busbars is shown in figure. In the contest of stability of the machine, which of the following is invalid?
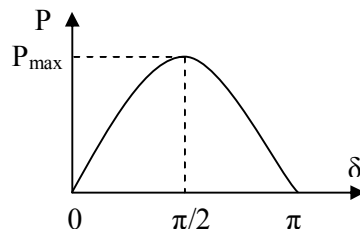
    A)   When $0 \leq \delta < \pi/2$, the machine operates with in the steady state stability limit
    B)   When $\delta = \pi/2$, the machine is at the verge of steady state stability
    C)   When $\pi/2 < \delta \leq \pi$ the machine is beyond the steady state stability limit
    D)   None of the above

41. Back-to back connection is used in HVDC system to
    A)   Provide synchronous tie between two systems
    B)   Provide bulk power transmission over long distance
    C)   Provide asynchronous tie between two systems
    D)   Reduce the line voltage drop and the transmission loss

42. Three-phase 12 pulse Thyristor Controlled Reactor (TCR) employs a transformer containing a star connected primary and two sets of secondary coils connected in star and delta respectively as shown in figure. Each secondary winding is equipped with three-phase delta connected TCR (Not Shown in the figure). This arrangement of FACT controller
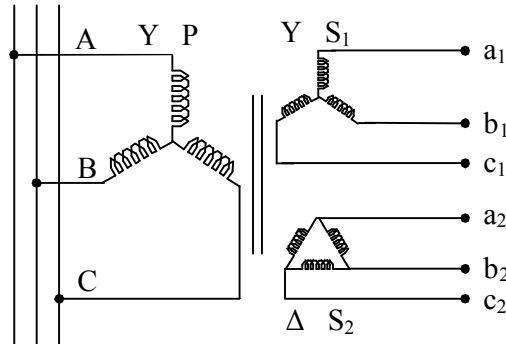

A) Eliminates the 3rd harmonics
B) Eliminates all the higher order 3n – harmonics, where n = 2, 3, 4, ... ∞
C) Eliminates 5th and 7th harmonics
D) All of the above

43. Due to skin effect
A) Portion of conductor near the outer surface carries less current and the inner core of the conductor carries more current
B) Portion of conductor near the outer surface carries more current and the inner core of the conductor carries less current
C) Current density over the entire cross section of the conductor is uniform
D) Current density near the center of the conductor is maximum and near the surface of the conductor zero

44. When the communication line run parallel to the power lines in close proximity
P. The electromagnetic effect produces current due to induction resulting its superposition on the speech signal of the communication line causing distortion
Q. The electrostatic effect raises the potential of the communication circuit as a whole and thereby posing a threat of damage to the communication equipments
R. The conductors of the power line is regularly transposed to balance the capacitance of the lines

Which of the following combinations is valid?

A) R only   B) P, Q & R
C) P & Q only   D) P & R only

45. A 1000 m d.c. ring distributor has loads and current directions as shown in figure. The resistance of conductor over the entire length is uniform and the loads are tapped off at points B, C and D. If the distributor is fed at point A, the currents through the feeder at segments AB, BC DC and AD respectively are
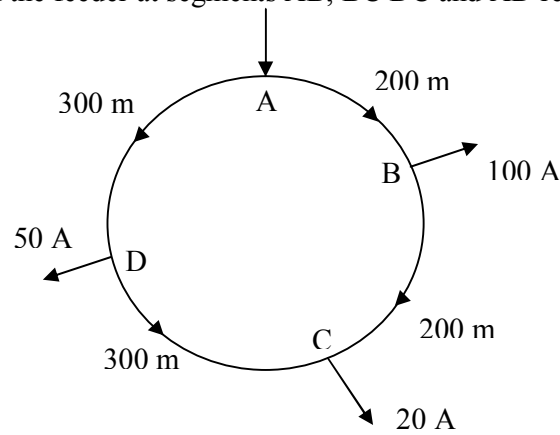
A) 100, 0, 20, 70   B) 110, 10, 10, 60
C) 107, 7, 13, 63   D) 85, -15, 85, 35

46. Figure shows the operating characteristic of the impedance type distance relay. Here the effect of control spring is neglected. Z is the impedance faced by the relay whose locus forms the circle. The relay will operate when
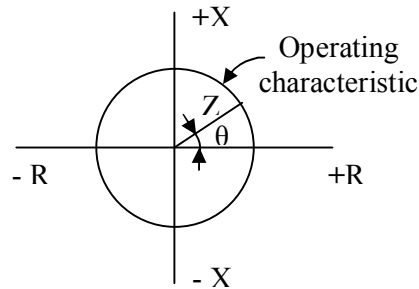
A) The value of Z is less than the radius of the circle
B) The value of Z is greater than the radius of the circle
C) The value of Z become equal to the radius of the circle
D) The value of Z become zero

47. A per phase transmission line is represented as a two port with pair of input terminals and pair of output terminals. The sending end voltage per phase is V_S and the sending end current I_S are represented in terms of respective receiving end parameters as $V_S = AV_R + BI_R$ and $I_S = CV_R + DI_R$. Where A, B, C and D are the generalized circuit constants called as transmission parameters. For the transmission line to be bilateral and symmetrical, the conditions to be satisfied is given respectively by
A) $A = D$ and $AD - BC = 1$ B) $AD - BC = 1$ and $A = D$
C) $A = D$ and $B = C$ D) $B = C$ and $A = D$

48. A bus coupler circuit breaker is utilized in a sub-station for
    A) Connecting the transmission line with the bus-bar
    B) Connecting two power transformers in parallel
    C) Connecting the bus-bar with ground
    D) Connecting main and transfer buses in the sub-station

49. The effect of corona in high voltage a.c. transmission line is
    A) Increased energy loss in the transmission line
    B) Increased line reactance
    C) Increased line to line capacitance
    D) All of the above

50. Given $F(s) = 10 / (s^2 + 10^2)$. The final value of f(t) is :
    A) Infinity   B) Zero
    C) One   D) None of the above

51. In the case of second order differential equation if the damping ratio is unity, then the poles are
    A) Equal, positive and real   B) Imaginary and complex conjugate
    C) Equal, negative and real   D) None of the above

52. The steady state acceleration error of type-1 system is
    A) Unity   B) Infinity
    C) Constant   D) Zero

53. A plant is modeled as 1/(s(s+3)) with unity feedback control system and a cascade PI controller. How many state variables are required for state model description?
    A) 1   B) 2
    C) 3   D) 4

54. For better relative stability, the values of gain margin and phase margin should be respectively
    A) 6 db, 15 degree   B) 10 db, 15 degree
    C) 10 db, 30 degree   D) 6 db, 30 degree

55. The transient step response of two systems exhibits same peak time. The dominant poles of the two systems can be represented in s plane along
    A) A line parallel to X axis
    B) A line parallel to Y axis
    C) A line at an angle to negative real axis
    D) A semicircle

56. The unity circle of Nyquist plot corresponds to zero dB line of Bode plot for
    A) High frequencies   B) Low frequencies
    C) Medium frequencies   D) All frequencies

57. For a type three-control system the asymptote at lower frequency will have a slope
   A) – 6 db per octave B) – 18 db per octave
   C) – 20 db per octave D) – 60 db per octave

58. The Bode plot is used to analyze
   A) All phase network B) Minimum phase network
   C) Non minimum phase network D) All networks

59. In a second order system the value of resonant peak will be unity when the damping ratio has a value of
   A) Zero B) Unity C) 0.707 D) 0.414

60. The dc gain of the system represented by the transfer function
   G(s)=(s+6)/((s+2)(s+3)) is
   A) 1 B) 2 C) 5 D) 6

61. A system has transfer function (1–s) ÷ (1+s). It is
   A) Non minimum phase transfer function
   B) Minimum phase transfer function
   C) Low pass system
   D) Second order system

62. All pass network imparts
   A) Negative phase shift to input
   B) Positive phase shift to input
   C) 90 degree phase shift to input
   D) 180 degree phase shift to input

63. A derivative controller is mainly used for
   A) Improving transient response
   B) Decreasing steady state error
   C) Making steady state error zero
   D) All the above

64. A lag compensator with the zero 10 times farther from the imaginary axis than the compensator pole can improve the steady state error by a factor of
   A) 10 B) 5 C) 20 D) 2

65. The full scale deflecting torque of a 10A moving iron ammeter is 10×10^{-5}N-m.
   What will be the rate of change of self inductance of this instrument at full scale?
   A) 1 H / rad B) 5 H / rad
   C) 2 H / rad D) 1.5 H / rad

66. A Wheatstone bridge requires a change of 10 Ω in the unknown arm of the bridge to produce a change in deflection of 5 mm of the galvanometer. The sensitivity of the galvanometer will be
   A) 0.5 mm/ Ω B) 2 Ω/ mm C) Either A or B D) 5 mm/ Ω

67. The Q-meter works on the principle of
    A) Mutual inductance
    B) Self inductance
    C) Series resonance
    D) Parallel resonance

68. DC ammeter has a resistance of 0.1 Ω and its current range is 0-100 A. If the range is to be extended to 0-300 A, what shunt resistance need to be connected?
    A) 0.025 Ω
    B) 0.05 Ω
    C) 0.015 Ω
    D) 0.03 Ω

69. A current of $-3 + 4\sqrt{2} \sin(wt+30^0)$ Ampere is passed through three meters. They are a center zero PMMC meter, a true rms meter and a moving iron instrument. The respective readings in ampere will be
    A) $-3, 5, 5$
    B) $5, 4, -3$
    C) $-3, 4, 3$
    D) $3, 5, 3$

70. The range of a dc milliammeter can be extended by utilizing a
    A) Series high resistance
    B) Series low resistance
    C) Shunt of high resistance
    D) Shunt of low resistance

71. If one of the control springs of PMMC ammeter is broken when it is connected in a circuit, the meter will read
    A) Half the correct value of current
    B) Twice the correct value of current
    C) An indefinite figure
    D) Zero

72. If an energy meter disc makes 10 revolutions in 100 seconds when a load of 450W is connected to it, the meter constant in revolutions per kWh is
    A) 1000
    B) 500
    C) 1600
    D) 800

73. A point charge of 120 mC is placed at the centre of a cube. What will be the total flux passing through one face of the cube?
    A) 120 mC
    B) 60 mC
    C) 20 mC
    D) 30 mC

74. Which of the following statements holds for the divergence of electric and magnetic flux densities?
    A) Both are zero
    B) These are zero for static densities but non zero for time varying densities
    C) It is zero for electric flux density
    D) It is zero for magnetic flux density

75. Which of the following amplifier configurations has the lowest input resistance?
    A) Common Emitter
    B) Common Base
    C) Common Collector
    D) Emitter Follower

76. The upper cut off frequency of a capacitive coupled RC amplifier is decided by
    A) Input Coupling capacitance
    B) Transistor internal capacitances
    C) Output coupling capacitance
   D) Bypass capacitance

77. Darlington pair amplifier refers to cascaded combination of
    A)   Two common collectors
    B)   Common collector and common emitter
    C)   Common Base and Common emitter
    D)   None of the above

78. Schmidt trigger is an example of a
    A)   Mono-stable multivibrator   B)   Bistable multivibrator
    C)   Astable multivibrator   D)   None of the above

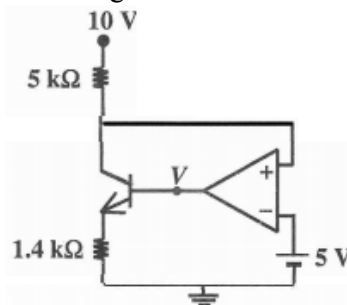79. What type of filter is implemented by the circuit below?
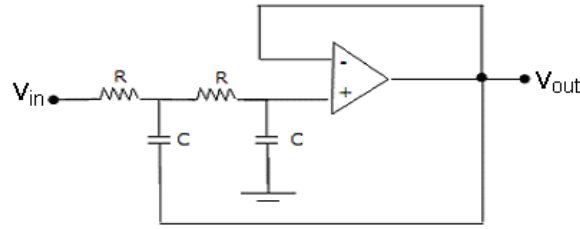
    A)   Band Pass   B)   Band Reject   C)   Low Pass   D)   High Pass

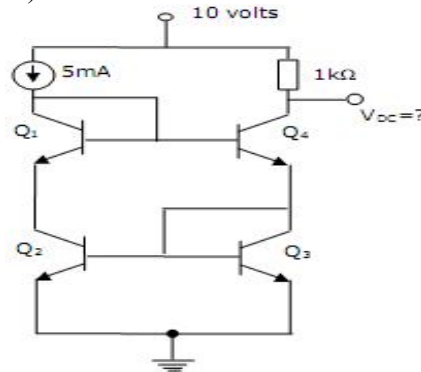80. Identify the type of feedback mechanism for the amplifier given below
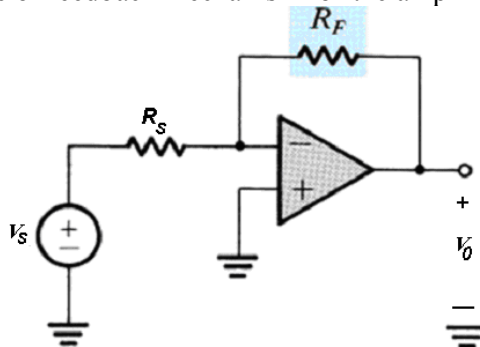
    A)   Series-Series   B)   Series-Shunt
    C)   Shunt-Series   D)   Shunt-Shunt

81. What is the value of voltage V?

    A)   5V
    B)   2 V
    C)   Positive saturation voltage of the op-amp
    D)   Negative Saturation Voltage of the op-amp

82. Find V_{DC} for the circuit shown below? (Assume high value of beta and forward bias $V_{BE} = 0.7$ V).


A) Cannot be found out with given data
B) 10 V
C) 5 V
D) 1.4 V

83. The fastest logic family among the below given ones is
A) TTL   B) ECL   C) CMOS   D) I^2L

84. The minimum number of NAND gates required to implement a XOR gate is
A) 5   B) 4   C) 3   D) 6

85. An example of a non-vectored interrupt in 8085 microprocessor is
A) INTR   B) TRAP   C) RST 5.5   D) RST 7.5

86. By which of the following connections, one-bit binary counter can be obtained from a JK flip-flop?
A) $J = K = 0$ B) $J = K = 1$
C) $J = K'$ D) None of these

87. If the input clock frequency is 50 Hz, what is the frequency of the output Q?
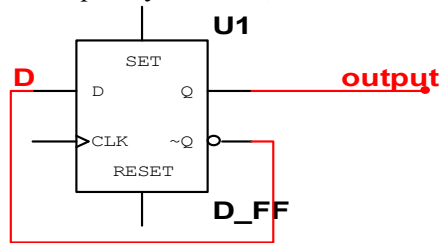
A) 100 Hz   B) 200 Hz   C) 25 Hz   D) 12.5 Hz

88. A 1 ms pulse can be converted into a 10 ms pulse by using
A) An astable mutivibrator   B) A monostable multivibrator
C) Bistable multivibrator   D) J-K flip flop.

89. How many flip-flops are required to construct a mod-32 counter?
    A)   32   B)   6   C)   5   D)   4

90. The figure shown is the voltage transfer characteristics of
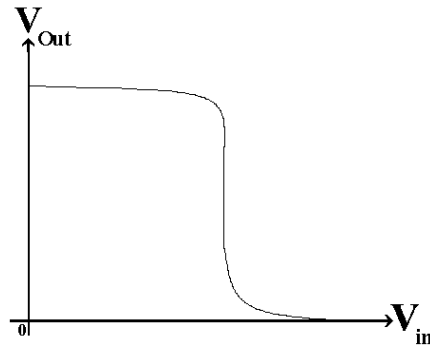
    A)   NMOS inverter with enhancement mode transistor as load
    B)   NMOS inverter with depletion mode transistor as load
    C)   BJT inverter
    D)   CMOS inverter

91. At which of the following sampling rates (T_s) is the signal $x(t) =$

    $\dfrac{1}{\pi t}\sin(3\pi t) \otimes \dfrac{1}{\pi t}\sin(5\pi t)$ not aliased? (here $\otimes$ stands for convolution)
    A) $T_s = 0.30$ secs   B) $T_s = 0.35$ secs
    C) $T_s = 0.4$ secs   D) $T_s = 0.45$ secs

92. If ω_m is the maximum frequency and ω_s is the sampling frequency, as per Nyquist theorem, what is the relationship between the two for perfect reconstruction?
    A) $2\omega_s < \omega_m$ B) $0.5\omega_s > \omega_m$
    C) $\omega_s \geq \omega_m$ D) $\omega_m = 2\omega_s$

93. The DTFT of $x[n] = \pi\delta[n]$ is
    A) $\delta(\Omega)$ B) π
    C)   1   D)   Does not exist

94. The FT of $x(t) \otimes y(t)$ is
    A) $X(j\omega) \otimes Y(j\omega)$ B) $2\pi X(j\omega)Y(j\omega)$
    C) $X(j\omega)Y(j\omega)$ D) $2\pi X(j\omega)Y(j\omega)$
    (where $\otimes$ stands for convolution)

95. The value of the integral $\displaystyle\int_{-1}^{+1}\delta(2t)dt =$
    A)   1   B)   ½
    C)   2   D)   Zero

96. The DTFS expansion of a periodic signal x[n] (with period =N) is given by:

A) $\dfrac{1}{N}\sum_{n=0}^{N-1} X[k]e^{jkn\left(\frac{2\pi}{N}\right)}$

B) $\dfrac{1}{N}\sum_{k=0}^{N-1} X[k]e^{jkn\left(\frac{2\pi}{N}\right)}$

C) $\sum_{k=0}^{N-1} X[k]e^{jkn\left(\frac{2\pi}{N}\right)}$

D) $\dfrac{1}{N-1}\sum_{k=0}^{N-1} X[k]e^{jkn\left(\frac{2\pi}{N}\right)}$

97. The FS of a periodic continuous-time signal x(t) is
   A) Continuous Complex-valued function
   B) Discrete Real-valued function
   C) Continuous Real-valued function
   D) Discrete Complex-valued function

98. An LTI system with impulse response $h(t) = e^{-2t}u(-t+1)$ is:
   A) Causal & BIBO stable
   B) Anti-causal & BIBO stable
   C) Anti-causal & BIBO unstable
   D) Causal & BIBO unstable

99. The signal x(t) = sin(t)/t is
   A) Even function   B) Odd function
   C) Neither odd nor even   D) Both odd and even

100. A discrete-time system with input-output relationship given by y[n] = x[n] / n is
   A) Invertible at all values of n   B) Invertible only if x[n] is finite
   C) Invertible only if x[n] ≠ 0   D) Non-invertible

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