

# ELECTRICAL ENGINEERING

## PAPER-II

1. If a 230 V dc series motor is connected to a 230 V ac supply,
  - a. the motor will vibrate violently
  - b. the motor will run with less efficiency and more sparking
  - c. the motor will not run
  - d. the fuse will be blown
2. The interpoles in dc machines have a tapering shape in order to
  - a. reduce the overall weight
  - b. reduce the saturation in the interpole
  - c. economise on the material required for interpoles and their windings.
  - d. increase the acceleration of commutation
3. Consider the following statements:  
At starting, the field excitation of a dc shunt motor is kept at its maximum value to reduce
  1. sparking at brushes
  2. acceleration time.
  3. starting current.
  4. voltage dip in supply.
 of these statements
  - a. 1 and 2 are correct
  - b. 2, 3 and 4 are correct
  - c. 1, 3 and 4 are correct
  - d. 1, 2, 3 and 4 are correct
4. As compared to the use of a single series dc motor for electric traction for a given starting time  $t$ , the series-parallel control using two similar motors with time  $t/2$  for each series and parallel operation would give a saving in starting energy of
  - a. 100%
  - b. 50 %
  - c. 25 %
  - d. Zero
5. Consider the following statements:

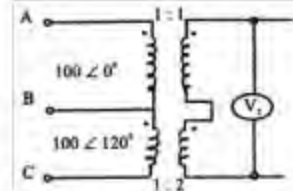
Permanent magnet dc motors used in cassette tape recorder have

1. magnets on stator and armature on the rotor.
2. magnets on the rotor and armature on the stator.
3. electronic commutation and no brushes.
4. mechanical commutation and brushes.
5. automatic speed governors.

Of these statements

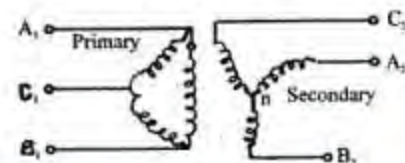
- a. 1, 3 and 5 are correct
- b. 1, 4 and 5 are correct
- c. 2, 3 and 5 are correct
- d. 1 and 4 are correct

6. Two single-phase transformers with turns ratios 1 and 2 respectively are connected to a 3-phase supply on the primary side as shown in the figure. The voltmeter  $V_1$  will read



- a. 100 V
- b. 173 V
- c. 200 V
- d. 265 V

7. In a 3-phase transformer shown in the figure, the phase displacement of secondary line voltages with corresponding primary line voltages will be



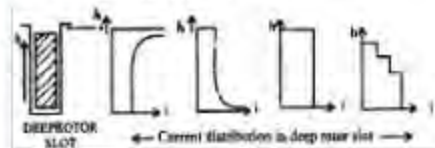
- a. zero

- b.  $30^\circ$  lag  
c.  $30^\circ$  lead  
d.  $180^\circ$
8. Three 3-phase transformers each rated at 75 MVA, 132 kV/1 kV, have the following different methods of cooling:
1. Self oil cooled
  2. Forced oil cooled.
  3. Forced air cooled.
- The correct sequence in ascending order in terms of the weights of these transformers is
- a. 1,2,3
  - b. 2, 3, 1
  - c. 3, 1, 2
  - d. 3, 2, 1
9. A single-phase induction regulator is a constant input transformer to obtain smooth variation of the output voltage by varying the
- a. ratio of turns between primary and secondary windings
  - b. frequency
  - c. flux density in the core
  - d. angle between the magnetic axes of the primary and secondary windings
10. An auto-transformer having a transformation ratio of 0.8 supplies a load of 10 kW. The power transferred inductively from the primary to the secondary is
- a. 10 kW
  - b. 8 kW
  - c. 2kW
  - d. Zero
11. If the dimensions of all the parts of a synchronous generator, and the number of field and armature turns are doubled, then the generated voltage will change by a factor of
- a. 1
  - b. 2
  - c. 4
  - d. 8
12. Consider the following statements  
The effects of slot harmonics are
1. skewing the slots
  2. fractional slot winding.
  3. short - chorded winding
  4. distributed winding.
- Of these statements
- a. 1 and 2 are correct
  - b. 2, 3 and 4 correct
  - c. 1, 3 and 4 are correct
  - d. 1 and 3 are correct
13. Which one of the following methods would give a higher than actual value of regulation of an alternator?
- a. ZPE method
  - b. MMF method
  - c. EMF method
  - d. ASA method
14. A turbo alternator set feeds power to a 3-phase constant-voltage, constant-frequency bus. If the steam supply to the set is cut off, then the set will
- a. continue to run at rated speed in the same direction
  - b. continue to run at a reduced speed in the same direction
  - c. run at rated speed in the reverse direction
  - d. come to a stop
15. An ideal synchronous motor has no starting torque because the
- a. rotor is made up of salient poles
  - b. relative velocity between the stator and the rotor mmf's is zero
  - c. relative velocity between stator and rotor mmf's is not zero
  - d. rotor winding is highly reactive
16. A synchronous motor is operating on no-load at unity power factor. If the field current is increased, the power factor will become
- a. leading and the current will decrease
  - b. lagging and the current will increase
  - c. lagging and the current will decrease
  - d. leading and the current will increase
17. A 3-phase induction machine draws active power 'P' and reactive power 'Q' from the grid. If it is operated as a generator, P' and Q will respectively be
- a. positive and negative



- b. negative and negative
- c. positive and positive
- d. negative and positive

18. The deep bar rotor of an induction motor is considered equivalent to a double cage rotor for the purposes of starting and performance. At the time of starting, the current distribution in deep bar rotor slot will be as shown in



19. A 3-phase induction motor fed by a 3-phase voltage controller is suitable for driving loads whose torque is
- a. constant irrespective of speed
  - b. inversely proportional to the square of speed
  - c. directly proportional to the square of speed
  - d. inversely proportional to speed

20. A 3-phase induction motor is used as an adjustable speed drive from zero to 2.0 per unit speed using a variable frequency inverter. In the speed range of 1.0 to 2.0 per unit, in order to ensure satisfactory operation,

Which one of the following sets of quantities is to be maintained approximately constant?

- a. Voltage and power
  - b. Flux and torque
  - c. Voltage and torque
  - d. Flux and power
21. A 3-phase slip-ring induction motor has chopper controlled resistance in the rotor circuit. Its power factor and efficiency can be characterised respectively as

- a. good and poor
- b. poor and good
- c. good and good
- d. poor and poor

22. A 3-phase slip-ring induction motor when started picks up speed but runs stably at about half the normal speed. This is because of

- a. unbalance in the supply voltages

- b. non-sinusoidal nature of the supply voltage
- c. stator circuit asymmetry
- d. rotor circuit asymmetry

23. The phenomenon of crawling in a 3-phase cage induction motor may be due to

- a. unbalance supply voltages
- b. 7th space harmonic of air-gap field
- c. 7th time harmonic of voltage wave
- d. 5th space harmonic

24. Zero sequence impedance of a 3-phase cage induction motor is due to

- a. stator circuit 3rd time harmonic
- b. stator circuit 3rd space harmonic
- c. rotor circuit 3rd time harmonic
- d. rotor circuit 3rd space harmonic

25. Consider the following statements:

Star-delta starter is used in 3-phase induction motor because it

1. prevents heating of the motor windings.
2. ensures permissible minimum starting current.
3. is regulated by electricity authorities.
4. ensures smooth run-up to full speed.

Of these statements :

- a. 1, 2 and 3 are correct
- b. 2, 3 and 4 are correct
- c. 1, 3 and 4 are correct
- d. 1 and 2 are correct

26. Match List-I (Types of motor) with List-II (Applications) and select the correct answer using the codes given below the lists :

#### List-I

- A. Shaded pole motor
- B. Capacitor motor
- C. Permanent magnet motor
- D. Steppermotor

#### List-II

1. Robotics
2. Rockets
3. Ceiling fan
4. Table fan

A B C D

- a. 4 3 1 2  
 b. 3 4 2 1  
 c. 3 4 1 2  
 d. 4 3 2 1

27. Hysteresis motors are used for Hi-Q record players because of their

- a. constant (synchronous) speed  
 b. extremely steady torque  
 c. insensitivity to supply voltage fluctuations  
 d. non-dependence on centrifugal switch requirement

28. Which of the following are the features of a shaded pole motor?

1. Salient-pole stator.  
 2. Uniform air-gap  
 3. Two stator windings one of which is a short-circuited ring  
 4. Squirrel cage rotor.

Select the correct answer using the codes given below:

- a. 1 and 4  
 b. 2 and 4  
 c. 1, 3 and 4  
 d. 1, 2 and 3

29. A hydel power plant of run-off-river type should be provided with a pondage so that the

- a. firm-capacity of the plant is increased  
 b. operating head is controlled  
 c. pressure inside the turbine casing remains constant  
 d. kinetic energy of the running water is fully utilised

30. If within an untransposed 3-phase circuit of a transmission lines the series impedance of each of the conductors is considered, it is found to contain resistive

terms of the form  $K \log \left( \frac{d_{12}}{d_{13}} \right) K$  being a

constant and  $d_{12}$  and  $d_{13}$  etc. being spacings between the conductors. These terms represent power transfer from one phase to another. The sum of these terms over the three phases is

- a. three times the average  
 b.  $\sqrt{3}$  times the average

- c. one-third of the average  
 d. zero

31. Match List-I (parameter) with List-II (Effects) and select the correct answer using the codes given below the Lists:

List-I

- A. Percent power lost in transmission  
 B. For a given current density, the conductor size  
 C. Power handling capacity of a line at a given voltage  
 D. Surge impedance of a transmission line

List-II

1. Decreases with system Voltage  
 2. Reduces with line length  
 3. Remains independent of line length  
 4. Increases with line length

	A	B	C	D
a.	1	2	4	3
b.	3	4	2	1
c.	3	2	4	1
d.	1	4	2	3

32. "Expanded ACSR" are conductors composed of

- a. larger diameter individual strands for a given cross-section of the aluminium strands  
 b. larger diameter of the central steel strands for a given overall diameter of the conductor  
 c. larger diameter of the aluminium strands only for a given overall diameter of the conductor  
 d. a filler between the inner steel and the outer aluminium strands to increase the overall diameter of the conductor

33. Which of the following are the advantages of interconnected operation of power systems?

1. Less reserve capacity requirement.  
 2. More reliability.  
 3. High power factor.  
 4. Reduction in short-circuit level.

Select the correct answer using the codes given below:

- a. 1 and 2  
 b. 2 and 3



- c. 3 and 4  
d. 1 and 4
34. Steady-state stability of a power system is improved by  
a. reducing fault clearing time  
b. using double circuit line instead of single circuit line  
c. single pole switching  
d. decreasing generator inertia
35. Equal area criterion gives the information regarding  
a. stability region  
b. absolute stability  
c. relative stability  
d. swing curves
36. With a number of generators of MVA capacities  $S_1, S_2, S_3, \dots, S_n$  and inertia constants  $H_1, H_2, \dots, H_n$ , respectively connected to the same bus bar in a station, the inertia constant of the equivalent machine on a base of  $S_b$  is given by  
a.  $\sum_{i=1}^n H_i S_i$   
b.  $\sum_{i=1}^n \frac{S_i}{S_b} H_i$   
c.  $\sum_{i=1}^n \frac{S_i}{S_b} H_i$   
d.  $\sum_{i=1}^n \frac{S_i}{S_b} \cdot \frac{1}{H_i}$
37. The critical clearing time of a fault in power systems is related to  
a. reactive power limit  
b. short-circuit current limit  
c. steady-state stability limit  
d. transient stability limit
38. The use of fast acting relays and circuit breakers for clearing a sudden short-circuit on a transmission link between a generator and the receiving-end bus improves the transient stability of the machine because the  
a. short-circuit current becomes zero  
b. post-fault transfer impedance attains a value higher than that during the fault  
c. ordinate of the post-fault power-angle characteristic is higher than that of during-fault characteristic  
d. voltage behind the transient reactance increases to a higher value
39. Consider the following statements:  
The transient stability of the power system under unbalanced fault conditions can be effectively improved by  
1. Excitation control  
2. phase-shifting transformer  
3. single-pole switching of circuit breakers  
4. increasing the turbine input.  
Of these statements  
a. 1 and 2 are correct  
b. 2 and 3 are correct  
c. 3 and 4 are correct  
d. 1 and 3 are correct
40. The non-uniform distribution of voltage across the units in a string of suspension type insulators is due to  
a. unequal self-capacitance of the units  
b. non-uniform distance of separation of the units from the tower body  
c. the existence of stray capacitance between the metallic junctions of the units and the tower body  
d. non-uniform distance between the cross-arm and the units
41. Whenever the conductors are dead-ended or there is a change in the direction of transmission line, the insulators used are of the  
a. pin type  
b. suspension type  
c. strain type  
d. shackle type
42. Consider the following statements :  
In the case of suspension-type insulators, the string efficiency can be improved 'by  
1. using a longer cross arm.  
2. using a guard ring.  
3. grading the insulator discs.  
4. reducing the cross-arm length.  
Of these statements  
a. 1, 2 and 3 are correct

- b. 2, 3 and 4 are correct
- c. 2 and 4 are correct
- d. 1 and 3 are correct

43. In a power system, each bus or node is associated with four quantities, namely

- 1. real power,
- 2. reactive power,
- 3. bus-voltage magnitude and
- 4. phase-angle of the bus voltage.

For load-flow solution, among these four, the number of quantities to be specified is

- a. an one
- b. any two
- c. any three
- d. all the four

44. Match List-I (Type of relay) with List-II (For the protection of) and select the correct answer using the codes given below the Lists :

**List-I**

- A. Buchholtz relay
- B. Translay relay
- C. Negative sequence relay
- D. Directional over current relay

**List-II**

- 1. Feeder
- 2. Transformer
- 3. Generator
- 4. Long Overhead line

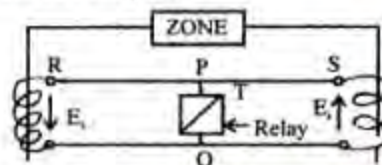
	A	B	C	D
a.	1	2	3	4
b.	2	1	3	4
c.	2	1	4	3
d.	1	2	4	3

45. A line trap in carrier current relaying tuned to carrier frequency presents

- a. high impedance to carrier frequency but low impedance to power frequency
- b. low impedance to both carrier and power frequency
- c. high impedance to both carrier and power frequency
- d. low impedance to carrier frequency but high impedance to power frequency

46. The basic circuit of circulating current system of protection is shown in the

figure. To improve the through-fault stability, a stabilizing resistor is connected between the points

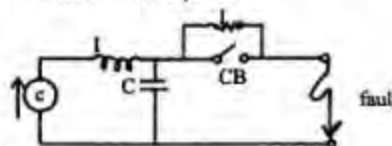


- a. R and P in series
- b. P and S in series
- c. P and T in series
- d. P and Q in parallel

47. One current transformer (CT) is mounted over a 3-phase 3-core cable with its sheath and armour removed from the portion covered by the CT. An ammeter placed in the CT secondary would measure

- a. the positive sequence current
- b. the negative sequence current
- c. the zero sequence current
- d. three times the zero sequence

48. In connection with the arc extinction in circuit breaker, resistance switching is employed wherein a resistance is placed in parallel with the poles of the circuit breaker as shown in the figure. This process introduces damping in the LC circuit. For critical damping, the value of 'r' should be equal to



- a.  $\sqrt{\frac{C}{L}}$
- b.  $0.5\sqrt{\frac{C}{L}}$
- c.  $0.5\sqrt{\frac{L}{C}}$
- d.  $\frac{1}{2\pi}\sqrt{\frac{L}{C}}$

49. 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
50. If a voltage-controlled bus is treated as load bus, then which one of the following limits would be violated?  
a. Voltage  
b. Active power  
c. Reactive power  
d. Phase angle
51. In a conventional reverse blocking thyristor  
a. external layers are lightly doped and internal layers are heavily doped  
b. external layers are heavily doped and internal layers are lightly doped  
c. the p-layers are heavily doped and n-layers are lightly doped  
d. the p-layers are lightly doped and the n-layers are heavily doped
52. If the amplitude of the gate pulse to thyristor is increased, then  
a. both delay time and rise time would increase  
b. the delay time would increase but the rise time would decrease  
c. the delay time would decrease but the rise time would increase  
d. the delay time would decrease while the rise time remains unaffected
53. In order to obtain static voltage equalization in series-connected SCRs, connections are made of  
a. one resistor across the string  
b. resistors of different value across each SCR  
c. resistors of the same value across each SCR  
d. one resistor in series with the string
54. Consider the following statements :  
The overlap angle of a phase-controlled converter would increase on increasing,  
the  
1. supply voltage  
2. supply frequency  
3. load current  
4. source inductance  
Of these statements  
a. 1, 2 and 3 are correct  
b. 2, 3 and 4 are correct  
c. 1, 2 and 4 are correct  
d. 1, 3 and 4 are correct
55. Analysis of voltage waveform of a single-phase bridge converter shows that it contains  $x\%$  of 6th harmonic. The 6th harmonic content of the voltage waveform of a 3-phase bridge converter would be  
a. less than  $x\%$  due to an increase in the number of pulses  
b. equal to  $x\%$ , the same as that of the single-phase converter  
c. greater than  $x\%$  due to changes in the input and output voltages of the converter  
d. difficult to predict as the analysis of converters is not governed by any generalised theory
56. In a single-phase semi-converter with resistive load and for a firing angle  $\alpha$ , each SCR conduction and freewheeling action take place respectively, for  
a.  $\alpha, 0^\circ$   
b.  $\pi - \alpha, \alpha$   
c.  $\pi + \alpha, \alpha$   
d.  $\pi - \alpha, 0^\circ$
57. The torque produced by a single phase induction motor fed through an ac voltage controller for speed control is due to  
a. fundamental component of current as well as harmonics, both odd and even  
b. fundamental component and even harmonic of current  
c. fundamental component and odd harmonics of current  
d. fundamental component of current alone
58. A dc chopper is fed from a constant voltage main. The duty ratio  $\alpha$  of the chopper is progressively increased while the chopper feeds a RL load. The per unit current ripple would  
a. increase progressively  
b. decrease progressively  
c. decrease to a minimum value at  $\alpha = 0.5$  and then increase

- d. increase to a maximum value at  $\alpha = 0.5$  and then decrease
59. In a two quadrant dc to dc chopper, the load voltage is varied from positive maximum to negative maximum by varying the time ratio of the chopper from
- zero to unity
  - unity to zero
  - zero to 0.5
  - 0.5 to zero
60. The purpose of feedback transformer and diode in complementary commutated inverters is to
- improve the power factor of the load
  - return the trapped energy to source
  - improve the input power factor
  - adsorb more reactive power from the source
61. Use of a reverse conducting thyristor in place of antiparallel combination of thyristor and feedback diode in an inverter
- effectively minimises the peak commutating current
  - decreases the operating frequency of operation
  - minimises the effects to lead inductances on the commutation performance
  - causes deterioration in the commutation performance
62. A voltage source inverter is normally employed when
- source inductance is large and load inductance is small
  - source inductance is small and load inductance is large
  - both source and load inductances are small
  - both source and load inductances are large
63. Match List-I with List-II and select the correct answer using the codes given below the Lists :

**List-I**

- Freewheeling diode
- Feedback diode
- Current source inverter
- Voltage source inverter

**List-II**

- Voltage spikes in the output voltage
- Peaks in the inverter current
- Inductive loads of phase-controlled converter
- Inductive loads of dc to ac inverters

	A	B	C	D
a.	4	3	1	2
b.	3	4	1	2
c.	3	4	2	1
d.	4	3	2	1

64. Match List-I with List-II and select the correct answer using the codes given below the Lists :

**List-I**

- Discontinuous conduction of the converter
- Source inductance of the converter
- Use of free-wheeling diode
- Symmetrical angle control

**List-II**

- Additional reactive power loading
- Better displacement factor
- Poor power factor
- Unity displacement factor

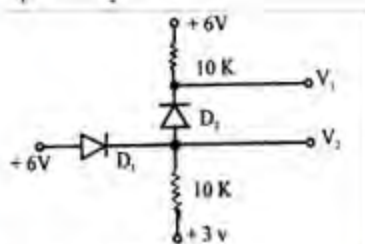
	A	B	C	D
a.	3	1	2	4
b.	1	3	2	4
c.	1	3	4	2
d.	3	1	4	2

65. Avalanche photodiodes are preferred over PIN diodes in optical communication systems because of
- speed of operation
  - higher sensitivity
  - larger bandwidth
  - larger power handling capacity
66. The drain source voltage at which the drain current becomes nearly constant is called
- barrier voltage
  - breakdown voltage
  - pick-off voltage
  - pinch-off voltage

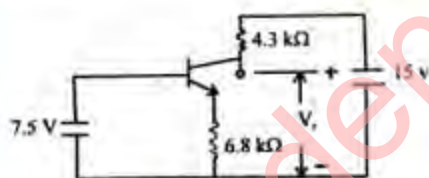


67. In the case of a BJT amplifier, bias stability is achieved by
- keeping the base current constant
  - changing the base current In order to keep the  $I_C$  and  $V_{CE}$  constant
  - keeping the temperature constant
  - keeping the temperature and the base current constant

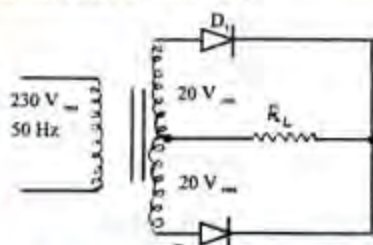
68. The voltages at  $V_1$  and  $V_2$  of the arrangement shown in the figure will be respectively



- 6 V and 5.4V
  - 5.4 V and 6 V
  - 3 V and 5.4 V
  - 6 V and 3 V
69. The best approximation for  $V_C$  in the circuit shown in the figure will be (assume  $\beta$  to be high)



- 4 V
  - 6.8
  - 8.7 V
  - 10.7 V
70. For the full-wave rectifier shown in the figure, the rms voltage across each diode will be (assume the diodes and the transformer to be ideal)



- 28.28 V

- 20 V
- 17.98 V
- 14.12 V

71. A transformer coupled amplifier would give
- maximum voltage gain
  - impedance matching
  - maximum current gain
  - larger bandwidth
72. Match List-I with List-II and select the correct answer using the codes given below the Lists :

#### List-I

- Class A amplifier
- Class B amplifier
- Class C amplifier
- Class AB amplifier

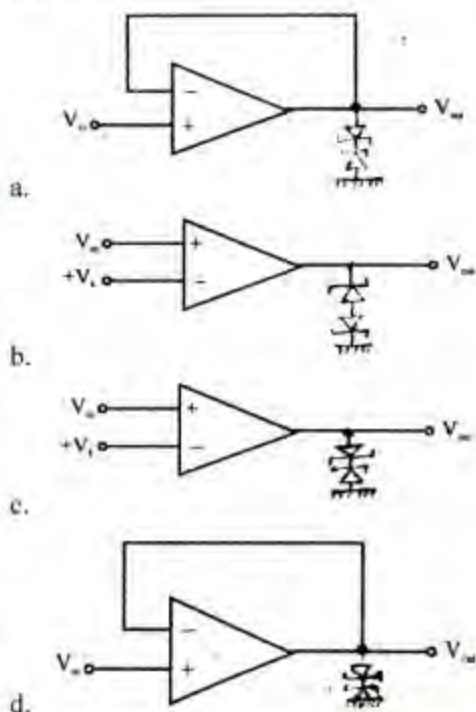
#### List-II

- Hi Fidelity
- Tuned amplifier
- Power amplifier
- Low distortion power amplifier

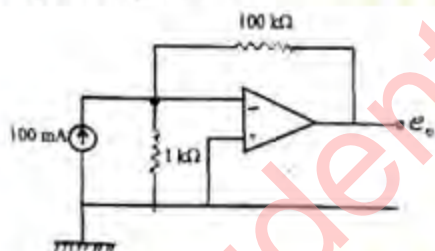
	A	B	C	D
a.	4	3	2	1
b.	1	2	3	4
c.	4	2	3	1
d.	1	3	2	4

73. The overall bandwidth of two identical voltage amplifiers connected in cascade will
- remain the same as that of a single stage
  - be worse than that of a single stage
  - be better than that of a single stage
  - be better if stage gain is low and worse if stage gain is high
74. If the differential and common mode gains of a differential amplifier are 50 and 0.2 respectively, then the CMRR will be
- 10
  - 49.8
  - 50.2
  - 250

75. An operational amplifier can be connected as a non-inverting voltage comparator as shown in

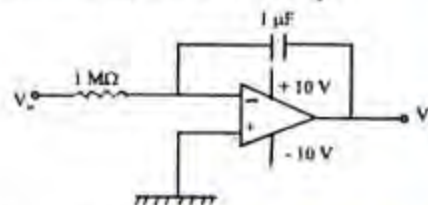


76. In the circuit shown in the given figure, the output voltage will be



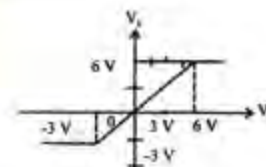
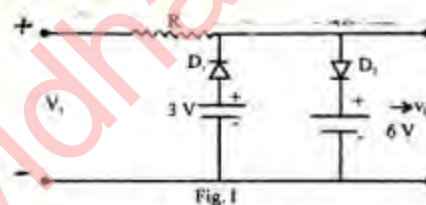
- a. 9 V  
b. 10 V  
c. 11 V  
d. 12 V
77. The open-loop gain of an operational amplifier is  $10^5$ . An input signal of 1 mV is applied to the inverting input with the non-inverting connected to the ground. The supply voltages are  $\pm 10$  V. The output of the amplifier will be
- a. +100V  
b. -100V  
c. 10 V (approximately)  
d. -10 V (approximately)

78. A unit positive step is applied at the input of the circuit shown in the figure. After 20 seconds, the output  $V_o$  will be

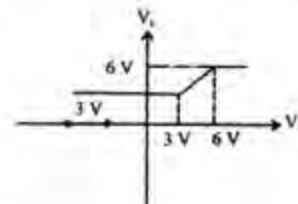


- a. +20 V  
b. -10 V  
c. -10 V  
d. -20 V

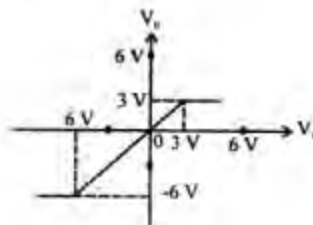
79. A clipping circuit is shown in the given Fig. I. Its transfer characteristic will be as shown in



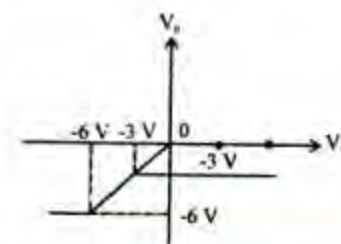
a.



b.



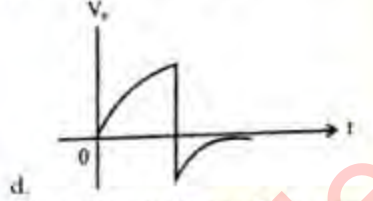
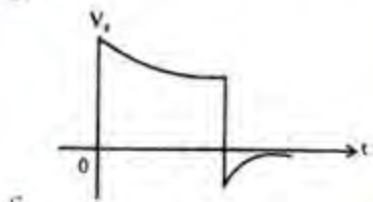
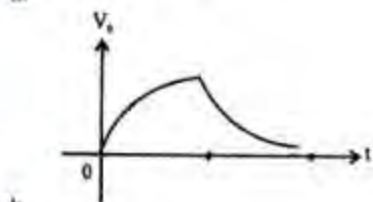
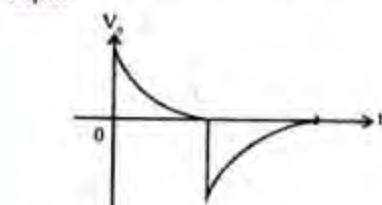
c.



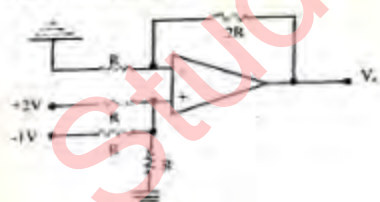
d.



80. Which one of low-pass filter the following correctly depicts the output of a to a pulse input



81. The output voltage of the circuit shown in the given figure is



- a. 1.0 V  
b. 1.5 V  
c. 2.0 V  
d. 2.5 V
82. The output of an EX-OR gate with A and B as inputs will
- a.  $AB + \overline{AB}$

- b.  $(A+B) + (\overline{A+B})$   
c.  $(A+B) \overline{AB}$   
d.  $\overline{A+B} + AB$

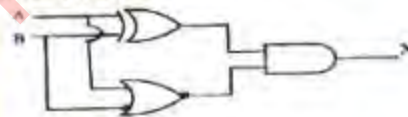
83. Which one of the following is an non-valid BCD code?

- a. 0111 1001  
b. 0101 1011  
c. 0100 1000  
d. 0100 1001

84. The expression  $(X+Y)(\overline{X+Y})(X+Y)$  is equivalent to

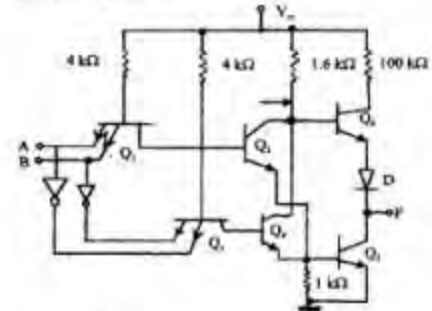
- a.  $\overline{XY}$   
b.  $\overline{XY}$   
c.  $\overline{XY}$   
d.  $\overline{XY}$

85. The output X of the circuit shown in the figure will be



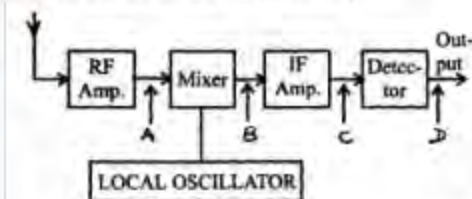
- a.  $AB$   
b.  $\overline{AB}$   
c.  $\overline{AB}$   
d.  $\overline{AB}$

86. The output 'F' of the circuit shown in the given figure is

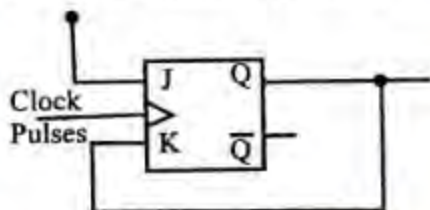


- a.  $\overline{AB}$   
b.  $\overline{AB}$   
c.  $AB + \overline{AB}$   
d.  $\overline{AB} + \overline{AB}$

87. The block diagram of an AM receiver is shown in the figure. The missing block and its location are respectively



- a. BPF at A  
b. HPF at B  
c. BPF at C  
d. LPF at D
88. In the circuit shown in the figure,  $Q = 0$ , initially. When clock pulses are applied, the subsequent states of 'Q' will be



- a. 1,0,1,0.....  
b. 0,0,0,0.....  
c. 1,1,1,1.....  
d. 0,1,0,1.....
89. For the diode matrix shown in the figure, the output  $Y_1$  will be



- a.  $X_0 X_2$   
b.  $X_1 X_3$   
c.  $X_1 + X_3$   
d.  $X_0 + X_2$
90. If a mod-6 counter is constructed using 3-flip-flops, the counter will skip
- a. 4 counts  
b. 3 counts  
c. 2 counts

- d. None of the counts
91. Which one of the following is an example of non-volatile memory
- a. Static RAM  
b. Dynamic RAM  
c. ROM  
d. Cache memory
92. An RRC instruction in 8085 microprocessor instruction set will affect
- a. CY, S, Z flags  
b. CY flag  
c. S flag  
d. Z flag
93. In a 8085 microprocessor, the following sequence of instructions is executed :  
STC  
CMC  
MOVE A, B  
RAL  
MOVE B, A  
After the last instruction the output will
- a. rotate the contents of the accumulator and store it in B  
b. get the contents of B register into accumulator and rotate it to left by one bit  
c. double contents of B register  
d. manipulate carry in A and B
94. The highest priority in 8085 microprocessor system is
- a. RST 7.5  
b. RST 6.5  
c. INTR  
d. TRAP
95. In 8085 microprocessor system, the direct addressing instruction is
- a. MOV A, B  
b. MOV B, 0AH  
c. MOV C, M  
d. STA addr
96. A fragment of assembly code is given below for 8085 :
- EI  
MVI 09  
SIM



This sequence of instructions

- Enables RST 7.5, RST 6.5 and RST 5.5
- Enables RST 7.5 and RST 6.5 and disables RST 5.5
- Enables RST 7.5 and disables RST 6.5 and RST 5.5
- Disables RST 7.5, RST 6.5 and RST 5.5

97. Consider the following Assembly Language program:

MVIA, 30H

ACI, 30H

XRA, A

POP H

After the execution of the above program, the contents of the

Accumulator will be

- 30H
- 60H
- 00H
- contents of Stack

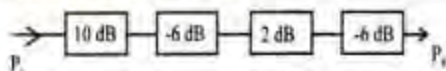
98. The rms thermal noise currents of three resistors are  $I_1$ ,  $I_2$  and  $I_3$  respectively. If these resistors are connected in parallel, the total equivalent noise current 'I' will be

- $I_1 + I_2 + I_3$
- $(I_1 + I_2 + I_3)^{1/3}$
- $I_1^2 + I_2^2 + I_3^2$
- $\sqrt{I_1^2 + I_2^2 + I_3^2}$

99. The capacity of channel is given by the

- number of digits used in coding
- volume of information it can take
- maximum rate of information transmitted
- bandwidth required for information

100. In respect of the block diagram shown in the figure, the input power is 1 m W. The output power  $P_0$  will be



- 2 m W
- 1 m W
- 0.5 m W

- zero

101. A carrier is simultaneously modulated by two sine waves with modulation indices of 0.4 and 0.3. The resultant modulation index will be

- 1.0
- 0.7
- 0.5
- 0.35

102. In FM, modulation index  $m_f$  is equal to ( $\Delta f$  is the frequency deviation and  $f_m$  is the modulating signal frequency)

- $\Delta f f_m$
- $\frac{f_m}{\Delta f}$
- $\frac{\Delta f}{f_m}$
- $\frac{1}{\Delta f f_m}$

103. The most useful modulation technique for high fidelity audio broadcasting on radio in current practice is

- amplitude modulation
- frequency modulation
- pulse amplitude modulation
- pulse code modulation

104. In a 100% amplitude modulated signal, if the total transmitted power is  $P$ , then the carrier power will be

- $\frac{2}{3} P$
- $\frac{1}{2} P$
- $\frac{1}{3} P$
- $\frac{1}{4} P$

105. Match List-I (Types of analog communication) with List-II (System bandwidth) and select the correct answer using the codes given below the Lists :

**List-I**

- Single sideband AM
- Wideband FM
- Vestigial sideband AM

D. Double sideband AM

### List-II

1. BW proportional to modulation index
2.  $BW = 2 \times \text{maximum signal frequency}$ ,  $F_{max}$
3.  $f_{max} < BW < 2f_{max}$
4.  $BW = f_{max}$

	A	B	C	D
a.	1	4	3	2
b.	4	1	3	2
c.	1	4	2	3
d.	4	1	2	3

106. A speech signal occupying the band width of 300 Hz to 3 kHz is converted into PCM format for use in digital communication. If the sampling frequency is 8 kHz and each sample is quantized into 256 levels, then the output bit rate will be

- a. 3 kb/s
- b. 8 kb/s
- c. 64 kb/s
- d. 256 kb/s

107. Message switching in computer communication

- a. is a store and forward system
- b. requires a dedicated path between transmitter and receiver
- c. is used only for long messages
- d. does not require a buffer at transmitter

108. In order to obtain monochrome display in a colour TV monitor, the green, red and blue colors are respectively added in the proportion

- a. 0.59, 0.20, and 0.21
- b. 0.60, 0.25 and 0.15
- c. 0.59, 0.30, and 0.11
- d. 0.60, 0.10 and 0.30

109. A broadcast radio receiver with IF = 455 kHz is tuned to 1500 kHz. The image frequency will be

- a. 1045 kHz
- b. 1500 kHz
- c. 1955 kHz
- d. 2410 kHz

110. Assertion (A) : The winding factor of slot harmonics is equal to that of the fundamental.

Reason (R) : Skewing of the rotor slots of an induction motor reduces the effects of slot harmonics.

- a. Both A and R are true and R is the correct explanation of A
- b. Both A and R are true but R is NOT a correct explanation of A
- c. A is true but R is false
- d. A is false but R is true

111. Assertion (A) : In a cylindrical rotor synchronous machine, the armature reaction flux  $\Phi_a$  is in phase with the armature current  $I$  but in a salient-pole machine  $\Phi_a$  is not in phase with  $I$ .

Reason (R) : The reluctances along the direct axis and the quadrature axis being different, the ratios of the mmfs and the respective fluxes in the two cases are not equal.

- a. Both A and R are true and R is the correct explanation of A
- b. Both A and R are true but R is NOT a correct explanation of A
- c. A is true but R is false
- d. A is false but R is true

112. Assertion (A) : One-phase supply can be converted to a 3-phase supply with the help of a suitable transformer.

Reason (R) : 3-phase supply can be converted to a 1-phase supply by a suitable transformer.

- a. Both A and R are true and R is the correct explanation of A
- b. Both A and R are true but R is NOT a correct explanation of A
- c. A is true but R is false
- d. A is false but R is true

113. Assertion (A) : The concept of self-GMD is applicable for the calculation of inductance of transmission lines.

Reason (R) : The radius of a conductor of transmission lines, in the expression for inductance is not the self GMD of the conductor.

- a. Both A and R are true and R is the correct explanation of A
- b. Both A and R are true but R is NOT a correct explanation of A
- c. A is true but R is false



- d. A is false but R is true
114. Assertion (A): The bulk supply into the large urban areas is often carried out by underground cables operating at 132 kV and above. This results in large generation of VARs by the cable and consequent rise in voltage at the receiving end.

Reason (R) : These VARs may be neutralised by using series capacitance in the line at appropriate intervals.

- a. Both A and R are true and R is the correct explanation of A
- b. Both A and R are true but R is NOT a correct explanation of A
- c. A is true but R is false
- d. A is false but R is true

115. Assertion (A) : A short length of cable between an overhead line and the substation is effective in reducing the incoming surge voltage.

Reason (R) : The surge impedance of the cable is quite low when compared with that of the incoming overhead line.

- a. Both A and R are true and R is the correct explanation of A
- b. Both A and R are true but R is NOT a correct explanation of A
- c. A is true but R is false
- d. A is false but R is true

116. Assertion (A) : Residual earth fault relays cannot give satisfactory protection in the case of resonant earthed system.

Reason (R) : Earth fault currents are very large.

- a. Both A and R are true and R is the correct explanation of A
- b. Both A and R are true but R is NOT a correct explanation of A
- c. A is true but R is false
- d. A is false but R is true

117. Assertion (A) : During inverter operation of a phase controlled thyristor power converter, the upper value of firing angle range is limited to a value of less than  $180^\circ$ .

Reason (R) : A thyristor requires a definite amount of time to regain forward blocking capability after its current has become zero.

- a. Both A and R are true and R is the correct explanation of A
- b. Both A and R are true but R is NOT a correct explanation of A
- c. A is true but R is false
- d. A is false but R is true

118. Assertion (A) : A 3-phase thyristorised full converter feeding a purely resistive load with delayed firing angle of thyristors will draw reactive power from the ac supply.

Reason (R) : The ac supply current at delayed firing angle will be non-sinusoidal and its fundamental component would lead the supply voltage.

- a. Both A and R are true and R is the correct explanation of A
- b. Both A and R are true but R is NOT a correct explanation of A
- c. A is true but R is false
- d. A is false but R is true

119. Assertion (A) : The gain of an RC coupled CE amplifier falls off at low frequencies.

Reason (R) : The low frequency response depends on the transistor junction capacitance.

- a. Both A and R are true and R is the correct explanation of A
- b. Both A and R are true but R is NOT a correct explanation of A
- c. A is true but R is false
- d. A is false but R is true

120. Assertion (A) : Read only memory (ROM) is a random access memory.

Reason (R) : Time taken to access any location of ROM is the same.

- a. Both A and R are true and R is the correct explanation of A
- b. Both A and R are true but R is NOT a correct explanation of A
- c. A is true but R is false
- d. A is false but R is true