ELECTRICAL ENGINEERING

PAPER-II

1. The direction of rotation of V d.c series motor can be reversed
   a. By interchanging supply terminals
   b. By interchanging field terminals
   c. Either by interchanging supply terminals or by interchanging field terminals
   d. By interchanging supply terminals as well as field terminals

2. Match List I with List II and select the correct answer:

   List I (Machine)
   A. DC Motor
   B. DC Generator
   C. Alternator
   D. Induction Motor

   List II (Graph)
   1. Circle Diagram
   2. V-Curve
   3. Open Circuit Characteristics
   4. Speed-Torque Characteristics

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

3. The current drawn by a 120 V d.c. motor with back e.m.f. of 110 V and armature resistance of 0.4 ohm is
   a. 4A
   b. 25A
   c. 275 A
   d. 300 A

4. Armature torque of a d.c. motor is a function of which of the following factors?
   1. Speed
   2. Field Flux
   3. Armature Current
   4. Residual Magnetism

   Select the correct answer using the codes given below:
   a. 2 and 3
   b. 1 and 4
   c. 3 and 4
   d. 1 and 2

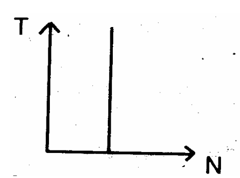
5. The dummy coils in d.c. machines are useful to
   a. Increase the efficiency
   b. Improve the commutation
   c. Reduce the cost of the machine
   d. Maintain mechanical balance of armature

6. The speed of a d.c. shunt motor may be varied by varying
   1. Field current
   2. Supply voltage
   3. Armature circuit

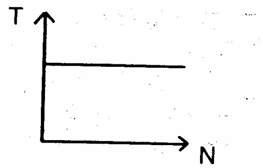
   Select the correct answer using the codes given below
   a. 1, 2 and 3
   b. 1 and 2
   4. 1 and 3
   5. 2 and 3

7. If the field of a synchronous motor is under excited, the power factor will be
   a. Lagging
   b. Leading
   c. Unity
   d. More than unity

8. Which of the following graphs represents the speed-torque characteristic of a synchronous motor?
   a.



   b.



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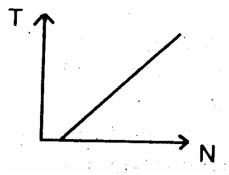

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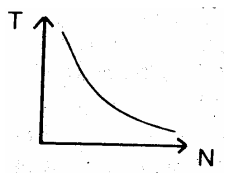


9. Match List I (Machine Components) with List II (Functions) and select the correct answer :

List I

A. Damper Winding
B. Interpole Winding
C. End Ring
D. Conservator

List II

1. Used in synchronous motor to provide starting torque
2. Used in d.c. generator to neutralize the reactance voltage and cross magnetizing effect of armature reaction
3. Used to short circuit rotor bars of cage-type induction motor
4. Used to protect transformers from damage when oil expands due to rise in temperature

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

10. An induction motor having 8 poles runs at 727.5 r.p.m. If the supply frequency is 50 Hz, the e.m.f. in the rotor will have a frequency of

a. 1.5 Hz
b. 48.5 Hz.
c. 51.5 Hz
d. 75 Hz

11. The synchronous reactance is the

a. Reactance due to armature reaction of the machine
b. Reactance due to leakage flux.
c. Combined reactance due to leakage flux and armature reaction
d. Reactance either due to armature reaction or leakage flux

12. Match List I (Type of AC Winding) with List II (Feature of AC Windings) and select the correct answer :

List I

A. Single Layer
B. Double Layer
C. Full Pitch
D. Chorded

List II

1. Coil span and pole pitch are. equal
2. Coil span is shorter than pole pitch
3. Number of slots is equal to number of coils
4. Number of slots is twice the number of coils

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

13. Match List I (Machines) with List II (Tests) and select the correct answer :

List I

A. Transformer V
B. DC Motor
C. Alternator
D. Induction Motor

List II

1. Slip Test
2. Blocked Rotor Test
3. Sumpner’s Test
4. Swinburne’s Test

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

14. The leakage reactance of a three-phase alternator determined by performing

a. Open circuit and zero power factor tests
b. Zero power factor and slip tests
c. Open- and short-circuit tests
d. Short-circuit and slip tests

15. Consider the following types of single-phase motors:
1. Capacitor start induction motor
2. Capacitor start and run induction motor
3. Permanent split capacitor motor
4. Shaded pole motor

The correct sequence of these in the ascending order or magnitude of starting torque is
a. 1, 2, 3, 4
b. 2, 3, 4, 1
c. 3, 4, 2, 1
d. 4, 3, 2, 1

16. Which one of the following statements is correct in respect of an induction motor ?
a. The maximum torque will depend on rotor resistance
b. Although the maximum torque does not depend on rotor resistance, yet the speed at which maximum torque is produced depends on rotor resistance
c. The maximum torque will not depend on standstill rotor reactance
d. The slip of induction motor decreases as torque increases

17. The crawling in the induction motor is caused by
a. Improper design of stator laminations
b. Low voltage supply
c. High loads
d. Harmonics developed in motor

18. The rotor slots are slightly skewed in squirrel-cage induction motor to
a. Increase the strengths of rotor bars
b. Reduce the magnetic hum and locking tendency of rotor
c. Economise on the copper to be used
d. Provide ease of fabrication

19. The injected e.m.f. in the rotor of induction motor must have
a. The same frequency as the slip frequency
b. The same phase as the rotor e.m.f.
c. A high value for satisfactory speed control
d. The same phase as the rotor e.m.f. and a high value for satisfactory speed control

20. In an induction motor, when the number of stator slots is equal to an integral multiple of rotor slots
a. There may be a discontinuity in torque-slip characteristics
b. A high starting torque will be available
c. The maximum torque will be high
d. The machine may fail to start

21. The use of higher flux density in the transformer design
a. Reduces the weight per kVA
b. Increases the weight per kVA
c. Has no relation with the weight of transformer
d. Increases the weight per kW

22. The function of oil in a transformer is to provide
a. Insulation and cooling
b. Protection against lightning
c. Protection against short circuit
d. Lubrication

23. A coil of 1000 turns is wound on a core. A current of 1 A flowing through the coil creates a core fluex of 1 mWb. The energy stored in the magnetic field is
a. 0.25 J
b. 0.5 J
c. 1 J
d. 2 J

24. Consider the following statements relating to the constructional features of a large power transformer:
1. The conservator is used to maintain the level of oil in the transformer tank
2. The bushing is used to protect transformer insulation against lightning over-voltages
3. The Buchholz relay is an over current relay
4. Silica gel is used to absorb moisture.

Which of these statements are correct ?
a. 1, 2, 3 and 4
b. 2 and 3
c. 1 and 4

d. 1, 2 and 4

25. Two transformers operating in parallel will share the load depending upon their

a. Ratings
b. Leakage reactance
c. Efficiency
d. Per unit impedance

26. A 1 kVa, 200/100 V, 50 Hz, single-phase transformer gave the following test results on 50 Hz :

OC (LV side) : 100 V, 20 watts

SC (HV side) : 5 A, 25 watts

It is assumed that no-load loss components are equally divided. The above tests were then conducted on the same transformer at 40 Hz.

Tests results were :

OC (HV) :160 V, W_1 watts.

SC (LV) : 10 A, W_2 watts

Neglecting skin effect, W_1 and W_2 will be

a. W_1 = 16 watts, W_2 = 25 watts
b. W_1 = 25 watts, W_2 = 31.25 watts
c. W_1 = 20 watts, W_2 = 20 watts
d. W_1 = 14.4 watts, W_2 = 25 watts

27. A generated station has a maximum demand of 30 MW, a load factor of 60% and a plant capacity factor of 50%. The reserve capacity of the plant is

a. 5 MW
b. 4 MW
c. 6 MW
d. 10 MW

28. When a 'pumped storage' power plant is operated in conjunction with a steam power plant

a. The operating cost of the steam plant becomes optimum
b. Load factor .of the steam plant is increased
c. Chances of the tripping of the system decrease because of the use of two heterogeneous types of plants
d. Operation of the storage plant in the puming-mode during the low-load period improves the steam-plant stability

29. Match List I with List II and select the correct answer :

List I (Components)

A. Moderator
B. Control Rod
C. Coolant
D. Shield

List II (Materials)

1. Boron
2. Concrete
3. Graphite
4. Sodium

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

30. The bus admittance matrix of a power system is given as

$$\begin{array}{c} \\ 1 \\ 2 \\ 3 \end{array}\begin{array}{c} \begin{array}{ccc} 1 & 2 & 3 \end{array} \\ \begin{vmatrix} -j\,50 & +j\,10 & +j\,5 \\ +j\,10 & -j\,30 & +j\,10 \\ +j\,5 & +j\,10 & -j\,25 \end{vmatrix} \end{array}$$

The impedance of line between bus 2 and 3 will be equal to

a. + j 0.1
b. – j 0.1
c. + j 0.2
d. – j 0.2

31. Th.e component inductance due to the internal flux-linkage of a non-magnetic straight solid circular conductor per metre length has a constant value, and is independent of the conductor-diameter, because

a. All the internal flux due to a current remains concentrated on the peripheral region of the conductor
b. The internal magnetic flux-density along the radial distance from the centre of the conductor increases proportionately to the current enclosed
c. The entire current is assumed to flow along the conductor-axis and the internal flux is distributed uniformly and concentrically
d. The current in the conductor is assumed to be uniformly distributed throughout the conductor cross-section

32. Match List I with List II and select the correct answer:

List I

A. Graetz Bridge Converter
B. Series Compensation
C. Sag Templates
D. Grading Ring

List II

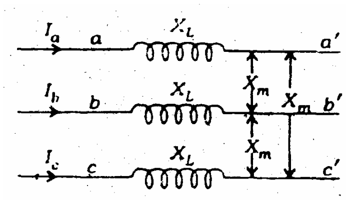
1. EHV/UHV AC Transmission
2. HVDC Transmission
3. Insulators
4. Tower Location

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

33. A 100 km long transmission line is loaded at 110 kV. If the loss of line is 15 MW and the load is 150 MVA, the resistance of the line is

a. 8.06 ohms per phase
b. 0.806 ohm per phase
c. 0.0806 ohm per phase
d. 80.6 ohms per phase

34.



The above circuit shows a 3-phase system having a balanced self-inductive reactance of X_L per phase a mutual reactance of X_m between pairs of phases. The line currents are I_a, I_b and I_c, and they may be unbalanced.

The series voltage-drop relations would be

$$V_{aa'} = I_a X_L + I_b X_m + I_c X_m$$
$$V_{bb'} = I_a X_m + I_b X_L + I_c X_m$$
$$V_{cc'} = I_a X_m + I_b X_m + I_c X_L$$

The positive, negative and zero-sequence reactances X_1, X_2 and X_0, respectively, would be

a. $(X_L - X_m)$, $(X_L - X_m)$ and $(X_L - 2X_m)$
b. $(X_L + X_m)$, $(X_L - 2X_m)$ and $(X_L + 2X_m)$
c. $(X_L - 2X_m)$, $(X_L + X_m)$ and $(X_L + X_m)$
d. $(X_L + 2X_m)$, $(X_L + 2X_m)$ and $(X_L + X_m)$

35. A rectangular voltage wave is impressed on a loss-free overhead line, with the far end of the line being short-circuited. On reaching the end of this line

a. The current wave is reflected back with positive sign, but the voltage wave with negative, sign
b. The current wave is reflected back with negative sign, but the voltage wave with positive .sign
c. Both the current and the voltage waves are reflected with positive sign
d. Both the current and the voltage waves are reflected with negative sign

36. Two insulator discs of identical capacitance value C make up a string for a 22 kV, 50 Hz, single-phase overhead line insulation system. If the pin to earth capacitance is also C, then the string efficiency is

a. 50%
b. 75%
c. 90%
d. 86%

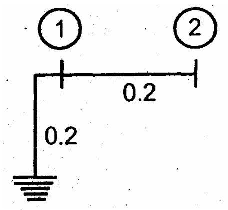
37. Which one of the following statements is not correct for the use of bundled conductors in transmission lines ?

a. Control of voltage gradient
b. Reduction in corona loss
c. Reduction in radio interference
d. Increase in interference with communication lines

38. A power system consists of two areas connected via a tie line. While enter in the data for load flow the tie line parameters and its connectivity data were inadvertently left out, if the load flow program is run with this incomplete data, then the load flow calculations will converge only if

a. One slack bus is specified in the first area
b. One slack bus is specified in the second area
c. One slack bus is specified in either of the two areas
d. TWO slack buses, one in each area, are specified

39.



In the network as shown above, the marked parameters are p.u. impedances. The bus-admittance matrix of the network is

a. $\begin{bmatrix} 10 & -5 \\ -5 & 5 \end{bmatrix}$

b. $\begin{bmatrix} 5 & -5 \\ -5 & 10 \end{bmatrix}$

c. $\begin{bmatrix} -10 & 5 \\ 5 & -5 \end{bmatrix}$

d. $\begin{bmatrix} -5 & 5 \\ 5 & -10 \end{bmatrix}$

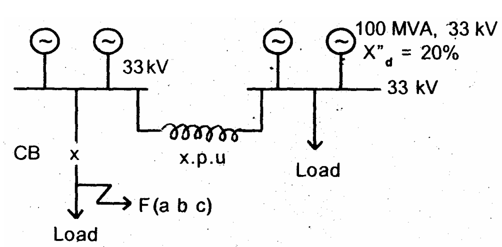
40. Consider the following statements with reference to protective relays

1. The minimum relay coil current at which the relay operates is called pick-up value.
2. The pick-up value of a relay is 7.5 A and fault current is 30 A. Therefore, its plug setting multiplier is 5.
3. An earth fault current is generally lesser than the short-circuit current.
4. Induction relays are used with both a.c. and d.c. quantities.

Which of these statements are correct ?

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

41.



Four identical 100 MVA, 33 kV generators are operating in parallel, as shown above, in two bus-bar sections, interconnected through a current limiting reactor of x p.u. reactance on the generator-base. Each generator has a reactance of 0.2 p.u.

The value of the reactor x to limit a symmetrical short-circuit (a-b-c) current through the circuit breaker to 1500 MVA is

a. 0.05 p.u.
b. 0.10 p.u.
c. 0.15 p.u.
d. 0.20 p.u.

42. The zero sequence current of a generator for line to ground fault is j 2.4 p.u. Then the current through the neutral during the fault is

a. j 2.4 p.u.
b. j 0.8 p.u,.
c. j 7.2 p.u.
d. j 0.24 p.u.

43. In HVDC transmission there are predominant

a. Voltage harmonics on d.c. side and current harmonics a.c. side of converters
b. Current harmonics on d.c. side and voltage harmonics on a.c. side of converters
c. Current harmonics only on the d.c. side of converters
d. Voltage harmonics only on the a.c. side of converters

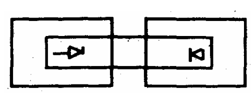
44. Match List I (Different Configurations for Asynchronous Interconnection) with List II (Corresponding Figures) and select the correct answer :

List I

A. Two-terminal DC Link
B. Back to back HVDC Link along with AC feeder
C. Back to back HVDC Link at border

List II

1.



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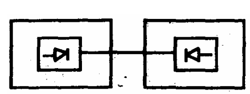

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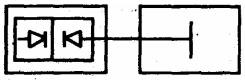
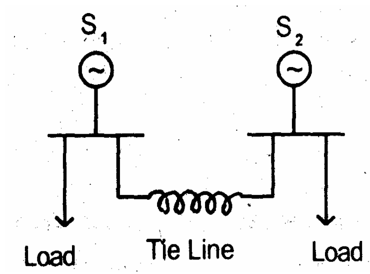


	A	B	C
a.	3	2	1
b.	2	3	1
c.	3	1	2
d.	2	1	3

45.



Consider a power system with two plants S_1 and S_2 connected through a tie line as shown above.

When the load-frequency control of the system is considered, the 'Flat tie-line control' system is preferred over the 'Flat frequency regulation system', because

a. It is advantageous to control the frequency from any one particular plant without disturbing the other one during load-swings on either S_1 or S_2 areas

b. This ensures that only the more efficient plant's input is controlled for load, variation in any area

c. Only the tie line is required to absorb the load-swing

d. The load-change in a particular area is taken care of by the generator in that area resulting in the tie-line loading to remain constant

46. In a p-n junction, to make the depletion region extent predominantly into p-region, the concentration of impurities in the p-region must be

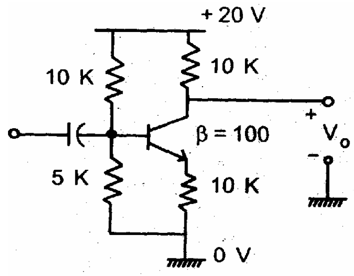
a. Much less than the concentration of impurities in n-region

b. Much higher than the concentration of impurities in n-region

c. Equal to the concentration of impurities in n-region

d. Zero

47.



Consider a silicon transistor connected as a common emitter amplifier as shown above. The quiescent collector voltage of the circuit is approximately

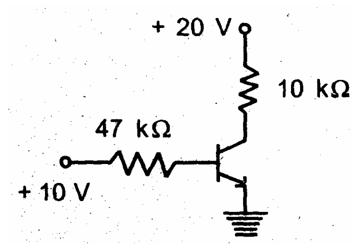
a. 6.67

b. 10 V

c. 14

d. 20 V

48.



In the transistor circuit as shown above, the collector to ground voltage is + 20 V. The possible condition is

a. Collector-emitter terminals shorted

b. Emitter to ground connection open

c. 10 kilo-ohms resistor open

d. Collector-base terminals shorted

49. In an RC coupled common emitter amplifier

a. Coupling capacitance affects the h.f. response, and bypass capacitance affects the 1.f response

b. Both coupling and bypass capacitances affect the h.f. response

c. Both coupling and bypass capacitances affect the 1.f. response only

d. Coupling capacitance affects the 1.f. response and the bypass. capacitance affects the h.f. response

50. Consider the following with reference to a CE transistor amplifier:

1. The use of negative feedback
2. The conversion of d.c. power to a.c.
3. High voltage and current gains
4. The use of a step-up transformer

The power gain is due to

a. 1 and 2

b. 2 and 3

c. 1 and 3

d. 1 and 4

51. The open-loop voltage gain of an amplifier is 240. The noise level in the output without feedback is 100 mV. If a negative feedback with $\beta = 1/60$ is used, the noise level in the output will be

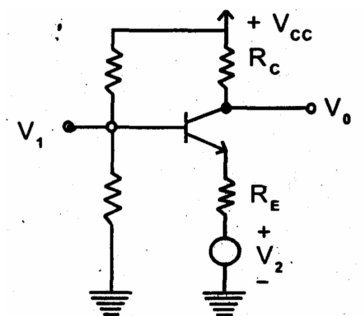
a. 1.66 mV

b. 2.4 mV

c. 4.0 mV

d. 20 mV

52.



In the circuit as shown above, the ratio of V_0 to $(V_2–V_1)$ would approximately (neglecting constant due to V_{cc}) be

a. R_C / R_E

b. R_E / R_C

c. $–R_C / R_E$

d. $–R_E / R_C$

53. An op-amp has a differential gain of 10^3 and a CMRR of 100. The output voltage of the op-amp with inputs of 120 μV and 80μV will be

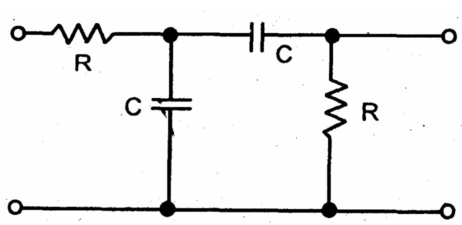
a. 26 mV

b. 41 mV

c. 100 mV

d. 200 mV

54.



An FET oscillator uses the given phase shift network as shown above. The minimum gain required for oscillation is

a. –29

b. 1

c. 3

d. 29

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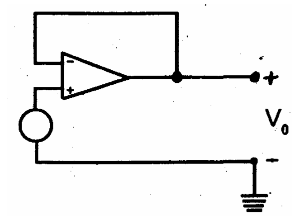


Consider the following statements with reference to an ideal voltage follower circuit as shown above :

1. Unity gain and no phase shift
2. Infinite gain and 180^0 phase shift
3. Very high input impedance and very low output impedance
4. It is a buffer amplifier

Which' of these statements are correct ?

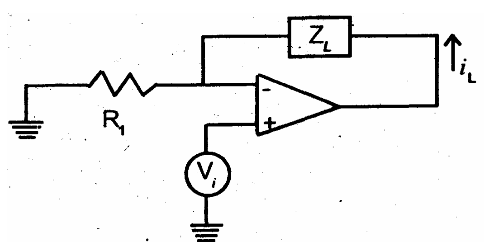
a. 1 and 3

b. 2 and 4

c. 1, 3 and 4

d. 1, 2, 3 and 4

56.



In the op-amp circuit as shown above, the current i_L is

a. V_i / Z_L

b. $V_i / Z_L \,||\, R_1$

c. V_i / R_1

d. $V_i(R_1 + Z_L)$

57. Match List I (Circuits) with List II (Characteristics/Applications) and select the correct answer :

List I

A. High-pass RC circuit

B. Low-pass RC circuit

C. Clamping circuit

D. Clipping circuit

List II

1. Comparator
2. DC Restorer

3. Integrator
4. Differentiator
5. Compensated Attenuator

	A	B	C	D
a.	5	4	2	1
b.	4	3	1	2
c.	5	4	1	2
d.	4	3	2	1

58. The simplified form of a logic function Y $= \overline{\overline{\left(\bar{A}\ \bar{B}\right)}.\overline{\left(\bar{A}\ \bar{B}\right)}}$ is

a. A + B

b. A B

c. $\bar{A} + \bar{B}$

d. $\bar{A}B + A\bar{B}$

59. The reduced form of the Boolean expression $A[B + C\overline{(AB + AC)}]$ is

a. $\overline{A}B$

b. $A\overline{B}$

c. AB

d. $AB + B\overline{C}$

60. An n-bit AID converter is required to convert analog input in the range 0-5 V to an accuracy of 10 mV. The value of n should be

a. 16

b. 10

c. 9

d. 8

61. Consider the following statements in respect of ECL gate:

1. Its switching speed is high
2. It provides OR and NOR logic operations
3. Its power dissipation is small as compared to other logic gates
4. Its logic levels are compatible with other logic family gates

Which of these statements are correct ?

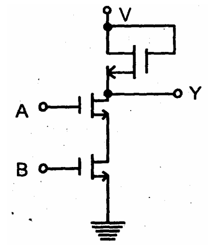
a. 1 and 2

b. 1, 2 and 3

c. 1, 2 and 4

d. 3 and 4

62.



The above shown NMOS circuit is a gate of the type

a. NAND

b. NOR

c. AND

d. EXCLUSIVE-OR

63. D flip-flop can be made from a J-K flip-flop by making

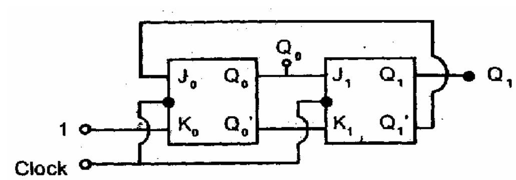
a. J = K

b. J = K = 1

c. J = 0, K = 1

d. J = K

64.



In the circuit as shown above, assuming initially $Q_0 = Q_1 = 0$. Then the states of Q_0 and Q_1 immediately after the 33rd pulse are

a. 1 1

b. 1 0

c. 0 1

d. 0 0

65. Which one of the following statements is not correct? Conversion of EXCESS-3 code to BCD can be achieved by using

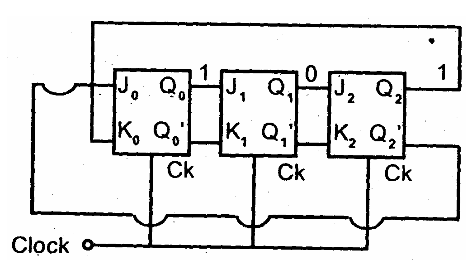
a. Discrete gates

b. 4 : 16 de-multiplexer

c. 4-bit full adder

d. A 4-bit half adder

66.



The three-stage Johnson Ring Counter as shown above is clocked at a constant frequency of f_c from the starting state of Q_0 Q_1 Q_2 = 101. The frequency of outputs Q_0 Q_1 Q_2 will be

a. $f_c / 8$

b. $f_c / 6$

c. $f_c / 3$

d. $f_c / 2$

67. A 4-bit modulo-16 ripple counter uses J-K flip-flop. If the propagation delay of each flip-flop is 50 nanoseconds, the maximum clock frequency that can be used is equal to

a. 20 MHz

b. 10 MHz

c. 8 MHz

d. 5 MHz

68. The binary representation 100110 is numerically equivalent to the

1. Decimal representation 46
2. Octal representation 46
3. Hexadecimal representation 26
4. Excess-3 representation 13

Select the correct answer using the codes given below :

a. 1 and 2

b. 2 and 3

c. 1 and 3

d. 2 and 4

69. A Direct Memory Access (DMA) transfer implies

a. Direct transfer of data between memory and accumulator

b. Direct transfer of data between memory and I/O devices without the use of microprocessor

c. Transfer of data exclusively with in microprocessor registers

d. A fast transfer of data between microprocessor and I/O devices

70. After an arithmetic operation, the flag register of a 8085 microprocessor has the following look:

D_7	D_6	D_5	D_4	D_3	D_2	D_1	D_0
1	0	X	1	X	0	X	1

The arithmetic operation has resulted in

a. A carry and an odd parity number having 1 as the MSB

b. Zero and the auxiliary carry flag being set

c. A number with even parity and I as the MSB

d. A number with odd parity and 9 as the MSB

71. The program counter in a 8085 microprocessor is a 16-bit register, because

a. It counts 16 bits at time

b. There are 16 address times

c. It facilitates the user storing 16-bit data temporarily

d. It has to fetch two 8-bit data at a time

72. A microprocessor is ALU

a. and control unit on a single chip

b. and memory on a single chip

c. register unit and I/O device on a single chip.

d. register unit and control unit on a single chip

73. In Intel 8085 A microprocessor ALE signal is made high to

a. Enable the data bus to be used as low order address bus

b. To latch data D_0 — D_7 from data bus

c. to disable data bus

d. To achieve all the functions listed above

74. Examine the following instruction to be executed By a 8085 microprocessor. The input port has an address of 01 H and has a data 05H to input :

```
IN    01
ANI   80
```

After execution of the two instructions the following flag portions may occur :

1. Zero flag is set
2. Zero flag is reset
3. Carry flag is cleared
4. Auxiliary carry flag is set

Select the correct answer using the codes given below:

a. 1 and 3

b. 2, 3 and 4

c. 3 and 4

d. 1, 2 and 4

75. Match List I (Introduction) with List Il (Type of Addressing) and select the correct answer :

List I

A. MOVA,M

B. LXIH, E400H

C. LDA Fl CDH

D. CMC

List II

1. Direct addressing
2. Register addressing
3. Implicit addressing
4. Register indirect addressing
5. Immediate addressing

	A	B	C	D
a.	5	4	1	3
b.	4	5	3	1
c.	5	4	2	3
d.	4	5	1	3

76. How many and which types of machine cycles are needed to execute PUSH PSW by an Intel 8085A microprocessor?

a. 2, Fetch and Memory write

b. 3, Fetch and 2 Memory write

c. 3, Fetch and 2 Memory read

d. 3, Fetch, Memory read and Memory write

77. Output of the assembler in machine codes is referred to as

a. Object program

b. Source program

c. Macroinstruction

d. Symbolic addressing

78. Three devices A, B and C are connected to an Intel 8085 A microprocessor. Device A has the highest priority and device C has the lowest priority. The correct assignment of interrupt inputs is

a. A uses RST 5.5, B uses RST 6.5 and C uses TRAP

b. A uses RST 5.5 B uses RST 6.5 and C uses RST 7.5

c. A uses RST 7.5, uses RST 6.5 and C uses RST 5.5

d. A uses TRAP, B uses RST 5.5 and C uses RST 6.5

79. If the accumulator of n Intel 8085 A microprocessor contains 37 H and the previous operation has set the carry flag, the instruction ACl 56 H will result in

a. 8 E H

b. 94 H

c. 7 E H

d. 84 H

80. Which one of the following statements about RAM is not correct?

a. RAM stands for random-access memory

b. It is also called read/write memory

c. When power supply is switched off, the information in RAM is usually lost

d. The binary contents are entered or stored in the RAM chip during the manufacturing state

81. A handshake signal in a data transfer is transmitted

a. Along with the data bits

b. Before the data transfer

c. After the data transfer

d. Either along with the bits or after the data transfer

82. Which one of the following is not a vectored interrupt ?

a. TRAP

b. INTR

c. RST 3

d. RST 7.5

83. Ports are used to connect the CPU to which of the following units?

1. Printer
2. Floppy disk drives
3. Video display unit
4. Incoming power supply

Select the correct answer using the codes given below :

a. 1 and 2

b. 2 and 3

c. 3 and 4

d. 1 and 3

84. For an AM signal, the bandwidth is 10 kHz and the highest frequency component present is 705 kHz. The carrier frequency used for this AM signal is

a. 695 kHz

b. 700 kHz

c. 705 kHz

d. 710 kHz

85. If large amount of information is to be transmitted in a small amount of time, we require

a. Low-frequency signals

b. Narrow-band signals

c. Wide-band signals

d. High-frequency signals

86. Match List I (System) with List II (Application) and select the correct answer:

List I

A. Pre-emphasis

B. Armstrong Method

C. Envelope Detector

D. De-Emphasis

List II

1. AM Detector
2. FM Receiver
3. FM Generator
4. FM Transmitter
5. AM Transmitter

	A	B	C	D
a.	4	3	2	1
b.	3	5	1	2
c.	4	3	1	2
d.	5	3	2	1

87. A modulator is a device to

a. Separate two frequencies

b. Impress the information on to a radio frequency carrier

c. Extract information from the carrier

d. Amplify the audio frequency signal

88. A modulation technique in which bandwidth of the modulated signal is extended well beyond the bandwidth of the modulating signal, independent of the modulating. signal bandwidth, is called

a. Wide-band modulation

b. Extended bandwidth modulation

c. Spread spectrum modulation

d. Narrow-band modulation

89. In AM, the percentage of total power in sideband is

a. 10%

b. 16.67%

c. 23.34%

d. 37.5%

90. Which of the following desirable features are possessed by SSB in comparison to AM ?

1. Less power is required
2. Bandwidth required is less
3. Antenna size can be reduced
4. Lower frequency can be used

Select the correct answer using the codes given below :

a. 3 and 4

b. 2, 3 and 4

c. 1 and 2

d. 1, 2 and 4

91. The detection-gain for coherent DSB demodulator is

a. 2

b. 4

c. 8

d. 16

92. Power spectral density of a signal is

a. Complex, even and non-negative

b. Real, even and non-negative

c. Real, even and negative

d. Complex, odd and negative

93. Which one of the following multiplexing techniques involves signals composed of light beams ?

a. CDM

b. FDM

c. TDM

d. WDM

94. In a communication system, a process for which statistical averages and time-averages are equal, is called

a. Stationary

b. Ergodic

c. Gaussian

d. BIBO stable

95. In which type of the switchings given below, entire capacity of a dedicated link is used ?

a. Circuit switching

b. Data gram packet switching

c. Virtual circuit packed switching

d. Message switching

96. In TV transmission, the modulation schemes for Video and Audio are, respectively

a. FM and AM

b. FM and FM

c. AM and FM

d. AM and AM

97. Match List I (Converters) with List II (Type of Conversion) and select the correct answer :

List I

A. Controlled Rectifier

B. Chopper

C. Inverter

D. Cycloconverter

List II

1. Fixed DC to variable voltage and variable frequency AC
2. Fixed DC to variable DC
3. Fixed AC to variable DC
4. Fixed AC to variable frequency AC

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

98. Turn-on and turn-off times of transistor depend on

a. Static characteristic

b. Junction capacitances

c. Current gain

d. None of the above

99. Match List I (Characteristic/Action) with List II (Observations) and select the correct answer:

List I

A. Turn-on time of thyristor

B. Turn-on time of transistor

C. Rate of rise of gate current in thyristor

D. If the gate pulse is removed, when the thyristor is carrying a current, less than latching current

List II

1. Depends on junction capacitances
2. Is the sum of delay and rise times
3. Thyristor switches back to OFF-state
4. Affect the delay time

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

100. An ideal chopper operating at a frequency of 500 Hz, supplies a load having resistance of 3 ohms and inductance of 9 mH from a 60 V battery. The mean value of the load voltage for on/off ratio of 4/1, (assuming that load is shunted by a perfect commutating diode and battery is loss-less) is

a. 240 V

b. 48 V

c. 15V

d. 4V

101. The characteristic features of discontinuous conduction compared to continuous conduction in a four-pulse, single-phase bridge converter are

a. Larger average value of load voltage and larger ripple-content

b. Larger average value of load voltage and smaller ripple-content

c. Smaller average value of load voltage and smaller ripple content

d. Smaller average value of load voltage and larger ripple-content

102. If the r.m.s. source voltage is V volts, the minimum and maximum values of firing angles for a single-phase, half-wave controlled rectifier, supplying a load with a back e.m.f. of 40 volts are

a. 0^0 and 180^o

b. $\alpha = \sin^{-1}(40/\sqrt{2V})$ and 180^0

c. $\alpha = \sin^{-1}(40/\sqrt{2V})$ and $[\pi - \sin^{-1}(40/\sqrt{2V})]$

d. 0^0 and $[\pi - \sin^{-1}(40/\sqrt{2V})]$

103. An AC voltage-regulator using back-to-back connected SCRs is feeding an RL load. The SCR firing angle $\alpha < \phi$ (ϕ is power factor angle of the load). If SCRs are fired using short-duration gate pulses, the output load-voltage waveform will be

a. Symmetrical chopped ac. voltage

b. Half-wave rectified

c. Full-wave rectified

d. Sinusoidal

104. In a self-controlled synchronous motor fed from a variable frequency inverter

a. The rotor poles invariably have damper windings

b. There are stability problems

c. The speed of the rotor decides stator frequency

d. The frequency of the stator decides the rotor speed

105. A d.c. source is switched in steps to synthesize the three-phase output. The basic three-phase bridge inverter can be controlled. The angle through which each switch conducts, and at any instant the number of switches conducting simultaneously are, respectively.

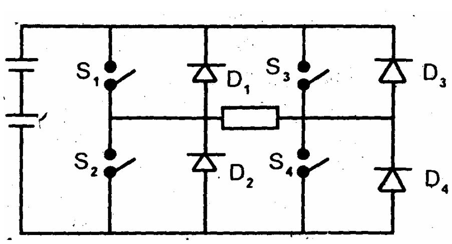
a. 120° and 02

b. 120° and 03

c. 180° and 02

d. 180^0 and 04

106.



For a single-phase, full-bridge inverter supplying power to a highly inductive load as shown above, the correct sequence of operation of switches and diodes is

a. $S_1S_4 - S_3S_2 - S_1S_4 - S_3S_2$

b. $D_1D_4 - S_1S_4 - D_2D_3 - S_2S_3$

c. $S_1D_3 - S_1S_4 - S_4D_2 - D_2D_3$

d. $S_2D_4 - D_4D_1 - D_1S_3 - S_3S_2$

107. A single-phase, half-bridge inverter has input voltage of 48 V DC. Inverter is feeding a load of 2.4 Ω. The r.m.s. output voltage at fundamental frequency is

a. $\frac{2\times 48V}{\pi}$

b. $\frac{2\times 48V}{\sqrt{2\pi}}$

c. $\frac{\sqrt{2}\times 48V}{\pi}$

d. $\frac{2\times 48V}{2\sqrt{2\pi}}$

108. A boost-regulator has an input voltage of 5V and the average output voltage of 15 V. The duty cycle is

a. 3/2

b. 2/3

c. 5/2

d. 15/2

109. An inter-group reactor is used in a single-phase cycloconverter circuit to

a. Reduce current-ripples

b. Reduce voltage-ripples

c. Limit circulating current

d. Limit di/dt in the semiconductor switch

110. Assertion (A) : DC series motors are suitable for cranes.

Reason (R) : DC, series motors provide high starting torque.

a. Both A and R are individually true and R is the correct explanation. of A

b. Both A and R are individually true but R is not the correct explanation of A

c. A is true but R is false

d. A is false but R is true

111. Assertion (A) : The short circuit, ratio (SCR) of a three-phase alternator should be high.

Reason (R) : A high value of SCR will decrease the value of voltage regulation and will increase the maximum power output.

a. Both A and R are individually true and R is the correct explanation. of A

b. Both A and R are individually true but R is not the correct explanation of A

c. A is true but R is false

d. A is false but R is true

112. Assertion (A) : Single-phase induction motor is not self-starting.

Reason (R) : No rotating magnetic field is set up in the air gap of a single-phase induction motor.

a. Both A and R are individually true and R is the correct explanation. of A

b. Both A and R are individually true but R is not the correct explanation of A

c. A is true but R is false

d. A is false but R is true

113. Assertion (A) : A double-cage induction motor has good starting characteristics.

Reason (R) : At starting, a large position of starting current flows in the bottom cage.

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

114. Assertion (A) : Hydroelectric plants with large storage can be best used as base toad plants high load factor.

Reason (R) : For a plant to .be used as base plant, the unit cost of energy generated by the plant should be low.

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

115. Assertion (A) : Transistor h-parameter equivalent circuit can be used for the analysis irrespective of the configuration (CE, CB or CC) of the transistor used.

Reason(R) : The values of h-parameter remain unchanged with transistor configuration.

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

116. Assertion (A) : In an asynchronous counter, output of each FF serves as CLK input signal for the next FF

Reason (R) : All the FFs do not change states in exact synchronism with the clock pulses.

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

117. Assertion (A) :. The zero-flag of a 8085 microprocessor is not affected after the execution of the following couple of instructions

MVI B, 03
MOV A, B

Reason (R) : After the execution of a data transfer instruction, zero-flag is set if the accumulator content is zero.

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

118. Assertion (A): Microwave links are generally preferred to coaxial cable for TV transmission.

Reason (R) : Microwave links have greater bandwidth than coaxial cables. .

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

119. Assertion (A) : FM transmission is noise free.

Reason (R) : In FM, information is carried as frequency variation.

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

120. Assertion (A) : The critical rate of change of forward-voltage is the value of dv/dt, at which the device just goes into conduction without a gate pulse.

Reason (R) : Thyristors go to a state of conduction with the application of sharp rate of change of forward-voltage in the absence of gate pulse, even before the break- forward voltage limit is reached.

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