Objective Paper-II-2011

1. The applied voltage of a certain transformer is increased by 75%, while the frequency of the applied voltage is reduced by 25%. The maximum core flux density will

    (A) Increase by seven times (B) Increase by three times

    (C) Reduce by one quarter (D) Remain the same

2. A 10 kVA, 2500/250 single phase transformer has the following results

    OC Test: 250V; 0.8A; 50W

    SC Test: 60V;   3 A;   45W

    Then efficiency at half full load at 0.8 power factor will be

    (A) 98.49%   (B) 97.68%   (C) 98.28%   (D) 96.85%

3. A 4kVA. 400 V/200 V single phase transformer has resistance of 0.02 pu and reactance of 0.06 pu. The resistance and reactance referred to high voltage side are

    (A) 0.2Ω and 0.6Ω (B) 0.8Ω and 2.4Ω

    (C) 0.08Ω and 0.24Ω (D) 1Ω and 3Ω

4. The full-load copper–loss and iron-loss of a transformer are 6400W and 500W, respectively. The above copper loss and iron loss at half load will be

    (A) 3200 W and 250 W respectively (B) 3200 W and 500 W respectively

    (C) 1600 W and 125 W respectively (D) 1600 W and 500 W respectively

5. In a transformer, zero voltage regulation at full load is

    (A) Not possible

    (B) Possible at leading power factor load

    (C) Possible at lagging power factor load

    (D) Possible at unity power factor load

6. A two-winding 220V/110V, 1.5 kVA transformer is reconnected as a 220/330V autotransformer. It is re-rated as

    (A) 3.88kVA   (B) 4.488kVA   (C) 1.58kVA   (D) 2.258kVA

7. A 2V/1V two–winding transformer is connected as an autotransformer. Its voltage regulation as an autotransformer compared to the two-winding transformer is

    (A) The same   (B) 1.5 times   (C) 2 times   (D) 3 times

8. When one transformer is removed from a Δ/Δ bank of 30 kVA transformer, the capacity of the resulting 3 – phase transformer in V-V connection will be

    (A) 11.5kVA   (B) 17.3 KVA   (C) 20kVA   (D) 25.9kVA

9. Which three-phase connection can be used in a transformer to introduce a phase difference of 30° between its output and corresponding input line voltages?

    (A) Star–star   (B) Star–delta   (C) Delta–delta (D) Delta-zigzag

10. Conditions for parallel operation of transformers are

    (1) The same voltage ratio

    (2) The same per unit impedance

    (3) The same polarity

    (4) The same phase sequence

    (5) The same phase displacement

    Which are the absolutely essential conditions?

    (A) 1, 2, 3, 4 and 5   (B) 2, 3 and 4   (C) 3, 4 and 5   (D) 1,2 and 3

11. The emf induced in a conductor of machine driven at 600 rpm, the peak value of flux density is 1.0 Wb/m^2, diameter of machine 2.0 meter and length of machine 0.30m is

    (A) 41.83V   (B) 29.58V   (C) 9.42V   (D) 18.84V

12. A 440 V, 3 – phase, 10 pole and 50 Hz synchronous motor delivering a torque of $\dfrac{50}{\pi}$ Nm, delivers a power of

    (A) 50 W   (B) 500 W   (C) 1000 W   (D) 2000 W

13. The maximum efficiency occurs in a separately excited dc generator when the terminal voltage is 220 V and the induced emf is 240 V, the stray losses, if the armature resistance is $0.2\,\Omega$, will be:

    (A) 1000 W   (B) 2000 W   (C) 3000 W   (D) 4000 W

14. An eight pole dc generator has a simple wave wound armature containing 32 coils of 6 turns each. Its flux per pole is 0.06 Wb. The machine is running at 250 rpm. The induced armature voltage is

    (A) 96 V   (B) 192 V   (C) 384 V   (D) 768 V

15. How many segments will be there for the commutator of a 6-pole dc machine having a simple wave-wound armature with 72 slots?

    (A) 73   (B) 72   (C) 71   (D) 70

16. Which one of the following statements is correct for the ideal field excitation during starting in case of shunt and compound motors?

    (A)   Maximum, because motor torque required to overcome friction and load torque.

    (B)   Maximum, because voltage should be built slowly

    (C)   Maximum, because small excitation will lead to low operating speed during starting

    (D)   It can be anything because it does not matter in case of these motors

17. A turbine–generator set has a regulation constant of 6% on the generator rating of 120 MVA, 50Hz. The generator frequency decreases by 0.01 Hz. The increase in turbine output for steady-state operation is:

   (A) 0.8 MW   (B) 0.4 MW   (C) 0.2 MW   (D) 40 MW

18. With reference to hydropower station, the graphical representation of the discharge as a function of time is known as:

   (A) Monograph   (B) Hectograph

   (C) Load duration curve   (D) Hydrograph

19. On million cubic meters of water is stored in a reservoir feeding a water turbine. The density of water is 993 kg/m^3. If the centre of mass of water is 50 meters above the turbine and the losses are negligible, the energy produced by that volume of water is:

   (A) 135.3 MWhr   (B) 130 MWhr   (C) 120 MWhr   (D) 140 MWhr

20. For harnessing how variable water heads, the suitable hydraulic turbine with reaction and adjustable vanes runners is:

   (A) Frames   (B) Impeller   (C) Kaplan   (D) Pelton

21. In a thermal power station, a typical heat balance sheet, for a large turbine and surface condenser taken together, is the percentage distribution of heat energy in:

   (1) Work done or thermal efficiency

   (2) Friction and windage loss

   (3) Heat to circulating water

   (4) Heat in condensate to be retained to the boiler.

   The percentage amount of heat in the heads stated above, in the descending order is:

   (A) 3, 4, 1 and 2   (B) 2, 1, 4 and 3

   (C) 3, 1, 4 and 2   (D) 2, 4, 1 and 3

22. The incremental cost characteristics of two generators delivering a load of 200 MW are as follows:

   $$\frac{dF_1}{dP_1} = 2.0 + 0.01P_1$$

   $$\frac{dF_2}{dP_2} = 1.6 + 0.02P_2$$

   For economic operation the generators P_1 and P_2 should be

   (A) 120 MW and 80 MW   (B) 80 MW and 120 MW

   (C) 120 MW and 120 MW   (D) 80 MW and 80 MW

23. The radiation shield for a nuclear power reactor for biological safety is provided by having the reactor.

(A) Immersed in water pool

(B) Encased by thick metal walls

(C) Encased by thick concrete wall

(D) Isolated from outside world with strong magnetic fields

24. A 'Pumped storage hydro-electric plant' consists of:

(A) A synchronous machine and a multistage centrifugal pump in one shaft

(B) A synchronous machine, a reaction turbine, and a multistage centrifugal pump all in one shaft

(C) An induction generator, a synchronous machine and a reaction turbine, all in one shaft

(D) An induction generator, a synchronous machine, and a multistage centrifugal pump, all in one shaft

25. The economics of power plant is greatly influenced by:

(1) Load factor   (2) Utilization factor

(3) Unit capacity   (4) Type of load

(A) 1,2,3 and 4   (B) 1,3 and 4   (C) 1,2 and 3   (D) 2,3 and 4

26. Match List – I with List – II and select the correct answer using the code given below the lists:

	List I		List II
P	Thyrite arrester	1	Tower location
Q	Sag template	2	Cross bonding
R	Cable sheaths	3	Restriking voltage
S	Circuit breaker	4	Non-linear resistor

(A) P-3, Q-1, R-2, S-4   (B) P-4, Q-1, R-2, S-3

(C) P-3, Q-2, R-1, S-4   (D) P-4, Q-2, R-1, S-3

27. The line current of a – 3 phase power supply are: $I_R = 3 + j5\,A;\ I_Y = 2 + j2\,A;\ I_B = -2 - jl\,A$

The zero sequence current will be:

(A) $1 + j2\,A$ (B) $5 + j7\,A$ (C) $1 + j4\,A$ (D) $-2 - jl\,A$

28. The incremental fuel costs for two generating units G_1 and G_2 are given by:

$IC_1 = 25 + 0.2\,PG_1$ and $IC_2 = 32 + 0.2\,PG_2$ Where PG_1 and PG_2 are real powers generated by the units. The economic allocation for a total load of 250 MW, neglecting transmission loss, is given by

(A) $PG_1 = 142.5\,MW$ and $PG_2 = 107.5\,MW$ (B) $PG_1 = 109.75\,MW$ and $PG_2 = 140.25\,MW$

(C) $PG_1 = 125\,MW$ and $PG_2 = 125\,MW$ (D) $PG_1 = 100\,MW$ and $PG_2 = 150\,MW$

29.   The main objective of load frequency controller is to apply control of:
(A) Frequency alone
(B) Frequency and at the same time of real power exchange via the outgoing lines
(C) Frequency and at the same time of reactive power exchange via the outgoing lines
(D) Frequency and bus voltages

30.   The main objectives of load frequency control in a power system are:
(1)   To bring the steady state error to zero after load change
(2)   To maintain the net tie-line flow
(3)   To maintain voltages on all buses
(4)   To economize the cost of generation
(A) 1 and 2   (B) 2 and 3   (C) 3 and 4   (D) 1,2,3 and 4

31.   The current of a single phase load drawn from a 3-phase system, has:
(A)   Zero sequence component of current as zero
(B) Negative sequence component of current more than positive sequence component
(C)   Positive, negative and zero sequence components equal
(D)   Negative sequence component of current less than positive sequence component

32.   The 'Equal area criterion' for the determination of transient stability of synchronous machine connected to an infinite bus:
(A)   Ignores line as well as synchronous machine resistances and shunt capacitances
(B)   Assumes accelerating power acting on the rotor as constant
(C)   Ignores the effect of voltage regulator and governor but considers the inherent damping present in the machine
(D)   Takes into consideration the possibility of machine loosing synchronism after it has survived during the first swing

33.   If the inertia constant H = 8 MJ/MVA for a 50 MVA generator, The stored energy is:
(A) 50 MJ   (B) 8 MJ   (C) 400 MJ   (D) 6.25 MJ
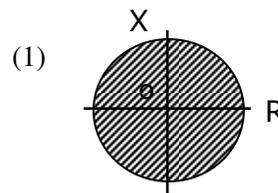
34.   Match List–I with List–II and select the correct answer using the code given below the lists.
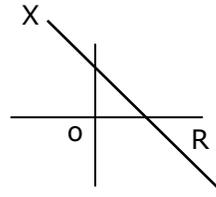
List – I   **List – II**

(P) Mho relay (1)   (1)

(Q) Plain impedance relay   (2)
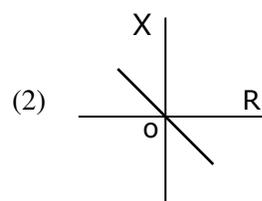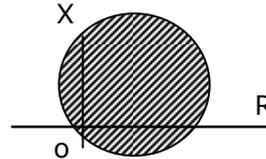
(R) Directional relay   (3)

X

o   R

(S) Angle impedance relay   (4)

X

R

o

(A) P-3, Q-2, R-1, S-4   (B) P-4, Q-1, R-2, S-3

(C) P-3, Q-1, R-2, S-4   (D) P-4, Q-2, R-1, S-3

35.   In an HVDC system
       (A) Both generation and distribution are dc
       (B) Generation is ac and distribution is dc
       (C) Generation is dc and distribution is ac
   (D) Both generation and distribution are ac

36.   Dark current in a semiconductor photodiode is
       (A) The forward bias current
       (B) The forward saturation current
       (C) The reverse saturation current
       (D) The transient current

37.   Compared to the bipolar junction transistor, a JFET:
       (1)   Has a larger gain bandwidth product
       (2)   Is less noisy
       (3)   Has less input resistance
       (4)   Has current flow due to only majority carries
       (A) 1, 2, 3 and 4 are correct   (B) 1 and 2 are correct
       (C) 2 and 4 are correct   (D) 3 and 4 are correct

38.   An emitter follower regulator has the following disadvantage
       (A) It does not provide high gain
       (B) No provision exists for varying the output voltage
       (C) Its output resistance is high
       (D) It cannot withstand high load current

39.   Consider the following statements:

(1)   A zener diode degrades the input signal at high frequencies due to its transition capacitance.

(2)   The zener voltage V, does not vary with temperature

(3)   Regulation the zener diode is adversely affected at the knee current due to limited power dissipation capacity

(4)   In a simple zener diode regulated circuit, amplification is not possible

Which of these statements are correct?

(A) 1, 2, 3 and 4   (B) 3 and 4   (C) 2 and 3   (D) 1 and 4

40.   For a transistor, turn-off time is:

(A) Sum of storage time and fall time   (B) Maximum value of storage time

(C) Maximum value of fall time   (D) Sum of rise time and fall time

41.   In a common collector amplifier, the voltage gain is:

(A) Constant   (B) Less than 1

(C) Varies with input voltage   (D) Varies with load impedance

42.   For a trans-conductance amplifier, input and output resistances are respectively:

(A) ∞ and 0   (B) 0 and ∞ (C) 0 and 0   (D) ∞ and ∞

43.   Which one of the following is NOT true of direct coupled amplifiers?

(A) Low cost

(B) Can amplify high frequency signals

(C) Can amplify low frequency signals

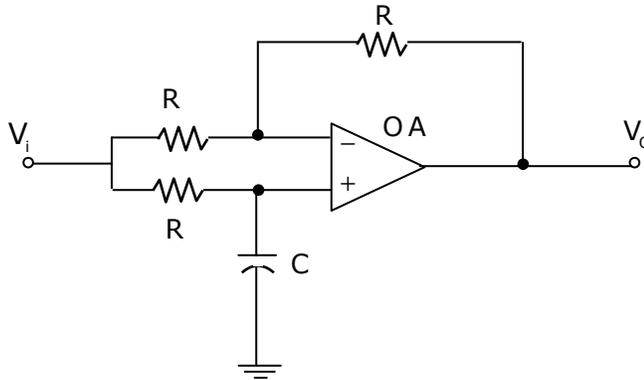(D) Operating points shifts with temperature variations

44.
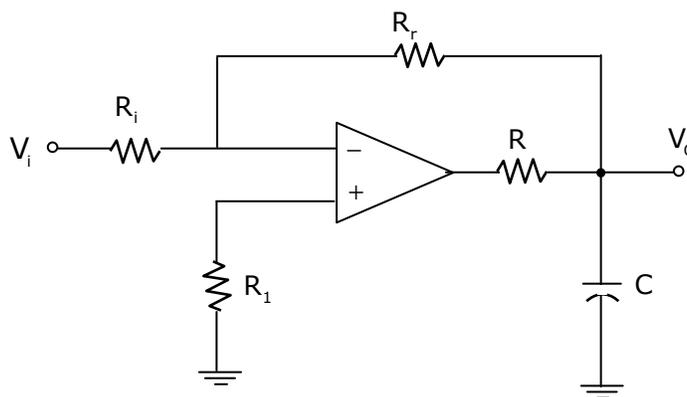
The circuit shown is:

(A) A low pass filter

(B) A clamper

(C) A lag compensated inverting amplifier

(D) A narrow band video amplifier

45.

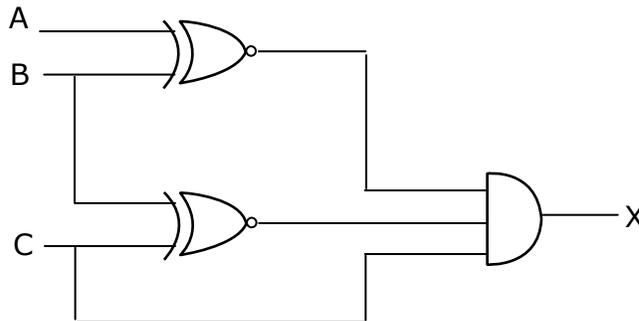The circuit shown is:

(A) A low pass filter   (B) A high pass filter

(C) A comparator   (D) An all-pass filter

46.   One shot multi-vibrator, with a pulse input gives an output:

(A) A single triangular pulse   (B) A square pulse

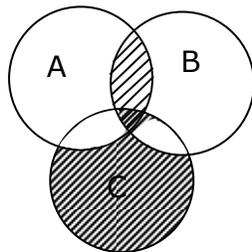(C) An impulse   (D) A single sinusoid pulse

47.

For logic circuit shown, the required inputs A, B and C to make the output X = 1 are,

(A) 1, 0 and 1   (B) 0, 0 and 1   (C) 1, 1 and 1   (D) 0, 1 and 1

48.

The Boolean expression for the shaded area in the Venn diagram shown is:

(A) $A + \overline{B} + C$ (B) $AB + \overline{A}BC$ (C) $A\overline{B}C + \overline{A}BC$ (D) $AB + \overline{A}\,\overline{B}C$

49.   Consider the following statements.

The h – parameters of a BJT:

(1) Represent the input resistance, output conductance, current gain etc

(2) Can be easily measured in the laboratory

(3) Can be used in circuit analysis over a wide range of frequencies

(4) Constitute a simple small signal model for easy circuit analysis at low frequencies where junction capacitances can be neglected.

Which of these statements are correct?

(A) 1, 2, 3 and 4   (B) 1, 2 and 4   (C) 1,3 and 4   (D) 2,3 and 4

50.   Consider the following statements:

(1)   Amplitude distortion arises due to different frequency components being amplified differently

(2)   White noise gives the same noise per unit bandwidth across the entire frequency spectrum

(3)   If an amplifier has two poles such that $p_2 = 4p_1$, then the dominant pole is p_2

(4)   The self-biasing emitter resistance of an amplifier is bypassed by a large capacitance to reduce degeneration at higher frequencies

Which of these statements are correct?

(A) 1, 2, 3 and 4   (B) 2 and 4   (C) 2 and 3   (D) 3 and 4

51.
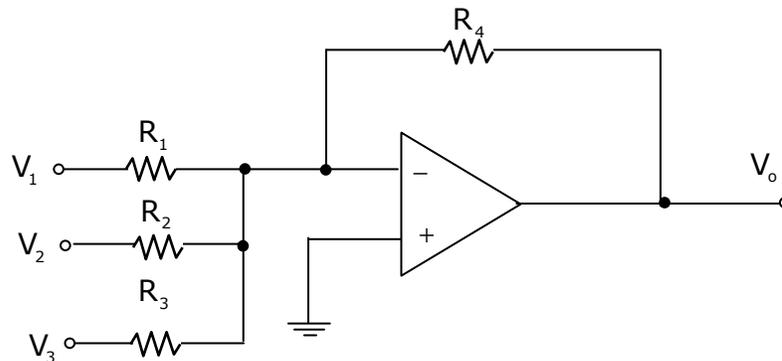
In the given circuit, the magnitude of the output voltage

$|V_o| = 3V_1 + 2V_2 + 7V_3$, then the values of R_1, R_2, R_3 and R_4 are:

(A) $3 k\Omega, 2 k\Omega, 7 k\Omega$, and $1 k\Omega$,

(B) $\dfrac{1}{4} k\Omega, \dfrac{1}{6} 6 k\Omega, \dfrac{7}{12} k\Omega$, and $12 k\Omega$,

(C) $4 k\Omega, 6 k\Omega, \dfrac{12}{7} k\Omega$, and $12 k\Omega$,

(D) $\dfrac{1}{3} k\Omega, \dfrac{1}{2} 6 k\Omega, \dfrac{1}{7} k\Omega$ and $12 k\Omega$

52.   A semiconductor ROM is preferred to a semiconductor RAM because:

(A) ROM is cheaper than RAM

(B) ROM is faster

(C) ROM does not require power supply for their operation

(D) Program stored in the ROM cannot be altered

53.   The first machine cycle of an instruction is always:

(A) A memory read cycle   (B) A fetch cycle

(C) An I/O read cycle   (D) A memory write cycle

54.   If the status of the control lines SI and SO is LOW, then 8085 microprocessor is performing:

(A) Reset operation   (B) HOLD operation

(C) Halt operation   (D) Interrupt acknowledge

55.   The output data lines of microprocessors and memories are usually tristated because:

(A)   More than one device can transmit information over the data bus by enabling only one device at a time

(B)   More than once device can transmit over the data bus at the same time

(C)   The data lines can be multiplexed for both input and output

(D)   It increases the speed of data transfers over the data bus

56.   AND operation of $(79)_{10}$ and $(-56)_{10}$ results in:

(A) 50H   (B) 48H   (C) 42H   (D) 08H

57.   ALU (Arithmetic Logic Unit) of an 8085 microprocessor consists of:

(A) Accumulator, temporary register, arithmetic and logic circuits

(B) Accumulator, arithmetic, logic circuits and five flags

(C) Accumulator, arithmetic and logic circuits

(D) Accumulator, temporary register, arithmetic, logic circuits and five flags

58.   The description of program counter (PC) in 8085 microprocessor is:

(A) An up/down counter

(B) An 8-bit register

(C) Initialized automatically by micro-processor

(D) Used to point to stack memory area

59.   Which components are NOT found on chip in a microprocessor but may be found on chip in a microcontroller?

(A) SRAM and USART   (B) EPROM and PORTS

(C) EPROM, USART and PORTS   (D) SRAM, EPROM and PORTS

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60.   Which value a program counter will have when non mask able interrupt of 8085 microprocessor is serviced?

(A) 0004 H   (B) 0014 H   (C) 0024 H   (D) 0034 H

61.   For the purpose of data processing an efficient assembly language programmer makes use of the general purpose registers rather than memory. The reason is:

(A)   The set of instructions for data processing with memory is limited

(B)   Data processing becomes easier when registers are used

(C)   More memory related instructions are required in the program for data processing

(D)   Data processing with registers takes fewer cycles than that with memory

62.   While a program is being executed in an Intel 8085 microprocessor, the program counter of the microprocessor contains

(A)   The memory address of the instruction that is being currently executed

(B)   The memory address of the instruction that is to be executed next

(C)   The number of instructions that have already been executed

(D)   The total number of instructions in the current program still to be executed

63.   Which one of the following statements is NOT correct?

(A) CMPA is a single byte instruction and CMA is not an instruction

(B) The instruction SUB A sets the zero flag

(C) Bus is a group of wires

(D) Instruction INR C does not affect carry flag

64.   To execute the following instructions

[i] LDA 2100 H

[ii] LXI H, 2100 H

by an Intel 8085 microprocessor the numbers of memory cycles required are:

(A) 2 for [i] and 2 for [ii]   (B) 4 for [i] and 2 for [ii]

(C) 3 for [i] and 3 for [ii]   (D) 4 for [i] and 3 for [ii]

65.   In 8085 microprocessor, during PUSH/PSW operation, stack pointer is:

(A) Decremented by one   (B) Decremented by two

(C) Incremented by one   (D) Incremented by two

66.
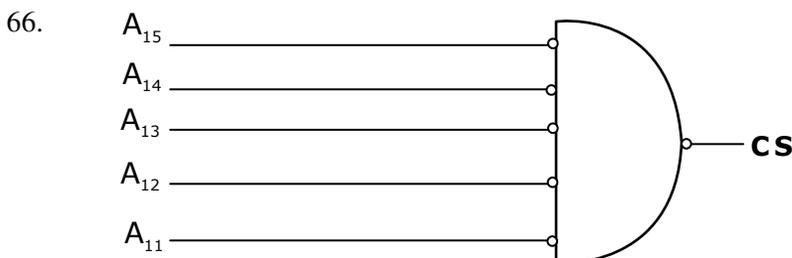
The logic circuit used to generate the active low chip select signal (CS) by an Intel 8085 microprocessor to address a peripheral is shown in the figure. The peripheral will respond to address in the range:

(A) 7800 H – 7FFF H   (B) 1000 H – 1FFF H

(C) 8000 H – 8FFF H   (D) 8800 H – 8FFF H

67. The 8259 A programmable Interrupt controller can

    (1)   Mange eight interrupts

    (2)   Vector an interrupt request anywhere in memory map

    (3)   Have 8-bit or 16 bit interval between interrupt vector locations

    (4)   Initialized with operational command words (OCW's)

    (A) 1 and 2   (B) 2 and 3   (C) 3 and 4   (D) 1, 2, 3 and 4

68. To address the full memory space of an Intel 8085 microprocessor four RAMS of different sizes are available:

    (1) $8K \times 8$

    (2) $16K \times 4$

    (3) $32K \times 4$

    (4) $32K \times 16$

    What minimal combination of chip(s) will serve the purpose?

    (A) 1, 2, 3 and 4   (B) 2   (C) 3   (D) 4

69. For which of the following systems, the signal to noise ratio is the highest?

    (A) PAM   (B) PWM   (C) PPM   (D) PAM and PWM

70. An indirect way of generating FM, is:

    (A) The Armstrong modulator   (B) The reactance FET modulator

    (C) The varactor diode modulator

    (D) The reactance bipolar transistor modulator

71. Diode demodulator will ignore:

    (A) The amplitude modulation   (B) The frequency modulation

    (C) PCM   (D) PWM

72. Match List–I with List–II and select the correct answer using the code given below the lists:

	List I		List II
P	Phase locked loop	1	Mixer
Q	Super-heterodyne receiver	2	De-emphasis filter
R	FM receiver	3	Diodes
S	Envelope detector	4	VCO

    (A) P-4, Q-1, R-2, S-3   (B) P-3, Q-1, R-2, S-4

    (C) P-4, Q-2, R-1, S-3   (D) P-3, Q-2, R-1, S-4

73.   Quantizing noise occurs in:
(A)   Pulse width modulation   (B) Frequency division multiplexing
(C)   Pulse code modulation   (D) Time division multiplexing

74.   If ACF denotes the autocorrelation function and PSD denotes the power spectral density, then for white noise, ACF is :
(A) A Gaussian while PSD is uniform
(B) A delta function while PSD is uniform
(C) A delta function while PSD is exponential
(D) An exponential while PSD is uniform

75.   The demodulation of a delta modulated signal is achieved by:
(A) Integration   (B) Differentiation
(C) Sampling   (D) Band pass filtering

76.   In phase modulation, phase deviation is proportional to:
(A) Carrier amplitude   (B) Carrier phase
(C) Message signal   (D) Message signal frequencies

77.   In differential PCM, each word indicates:
(A) Difference between a sample amplitude and a reference signal
(B) Difference in amplitude between a sample and the previous sample
(C) Addition of sample amplitude and a reference signal
(D) Addition of amplitude of sample and the previous sample

78.   PPM signal is:
(A) Differentiation of PWM   (B) Integration of PWM
(C) Differentiation of PAM   (D) Not related to PWM or PAM

79.   The main advantage of pre-emphasis circuit in FM transmitter is:
(A) To increase the carrier power
(B) To improve the signal to noise ratio at low audio frequencies
(C) To increase the bandwidth of side band
(D) To improve the signal to noise ratio at high audio frequencies

80.   The highest frequency stability is achieved by using an oscillator of the type:
(A) Colpitts   (B) Crystal controlled
(C) Hartley   (D) RC oscillator

81.   An aerial having a directivity of 90 is operating at a wavelength of 2 m. The maximum effective aperture of the aerial is:
(A) 7.16 m^2 (B) 14.32 m^2 (C) 28.64 m^2 (D) 57.28 m^2

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82. MSK (Minimum Shift Keying) is an orthogonal FSK scheme that gets its name from the fact that:

    (A) The phase shift is minimum

    (B) The error probability is minimum

    (C) The transmission power required is minimum

    (D) The transmission bandwidth required is minimum

83. In high, speed TDM, the channels are separated in the receiver employing:

    (A) OR gate   (B) NAND gate   (C) NOR gate   (D) AND gate

84. Which of the following component blocks is NOT required in the FDM transmitter block diagram?

    (A) Filter cutting of lower and higher frequencies

    (B) Filter cutting off higher frequencies

    (C) Single side band modulator

    (D) Double side band modulator

85. An SCR is in conducting state, a reverse voltage is applied between anode and cathode, but it fails to turn off. What could be the reason?

    (A) Positive voltage is applied to the gate.

    (B) The reverse voltage is small

    (C) The anode current is more than the holding current.

    (D) Turn off time of SCR is large.

86. A reverse conducting thyristor (RCT) normally replaces:

    (A) A pair of anti-parallel thyristor in a circuit

    (B) A combination of a thyristor and an anti-parallel diode in a circuit

    (C) A thyristor in a situation where it is not required to have reversed blocking capability at all

    (D) Conventional conversion grade thyristors having large turn off time

87. A thyristor can be switched from a non-conducting state to a conducting state by applying:

    (1) Voltage more than forward break over voltage

    (2) A voltage with high $\dfrac{dv}{dt}$

    (3) Positive gate current with positive anode voltage

    (4) Negative gate current with positive anode voltage

    (A) 1, 2, 3 and 4 are correct   (B) 1, 2 and 4 are correct

    (C) 1, 2 and 3 are correct   (D) 2, 3 and 4 are correct

88.   A structure obtained by lightly doped n-drift region between the layers of pn junction a PIN diode is obtained. This structure is effective in:

(A) Making the diode support large reverse blocking voltages

(B) Making reverse recovery process slow

(C) Making the diode have high on-state voltage drop

(D) Reducing the voltage spike during turn off due to stray inductance

89.   Which one of the following statements is NOT correct for a MOSFET?

(A) Are easy to parallel for higher current

(B) Leakage current is relatively high

(C) Have more linear characteristic

(D) Overload and peak current handling capability are high

90.   In a GTO, anode current beings to fall when the gate current:

(A) Is negative peak at time t = 0

(B) Is negative peak at time t = storage period t_s

(C) Just begins to become negative at t = 0

(D) Just begins to become positive at t = 0

91.   Consider the following statements:

(1)   A thyristor requires turn off circuit while transistor does not.

(2)   The voltage drop of a thyristor is less than that of transistor

(3)   A thyristor require a continuous gate current

(4)   A transistor draws continuous base current
        Which of these statements are correct?

(A) 1, 2, 3 and 4   (B) 1 and 2   (C) 2 and 4   (D) 1 and 4

92.   A field effect transistor with an anti-parallel body diode blocks:

(A)   Bidirectional voltage and passes unidirectional current

(B)   Bidirectional voltage and passes bidirectional current

(C)   Unidirectional voltage and passes unidirectional current

(D)   Unidirectional voltage and passes bidirectional current

93.   For low-speed high-power reversible operation, the most suitable drives are:

(A) Voltage source inverter fed ac drives   (B) Current source inverter fed ac drives

(C) Dual converter fed dc drives   (D) Cycloconverter fed ac drives

94.   An advantage of a cycloconverter is

(A) Very good power factor

(B) Requires few number of thyristors

(C) Commutation failure does not short circuit the source

(D) Load commutation is possible

95.   In dc choppers, the waveforms for input and output voltages are respectively:
       (A) Discontinuous and continuous   (B) Both continuous
       (C) Both discontinuous   (D) Continuous and discontinuous

96.   The use of multiphase rectifier in place of 1-phase rectifier results in:
       (A) Increased output voltage and reduced harmonics
       (B) Increased output voltage and increased harmonics
       (C) Decreased output voltage and reduced harmonics
       (D) Increase output voltage and no effect on harmonics

97.   In a 3–phase semi–converter, for firing angle less than or equal to 60º, freewheeling diode
       conducts for:
       (A) 90º   (B) 60º   (C) 30º   (D) 0º

98.   What is the waveform of the current flowing through the diode in a buck-boost converter?
       (A) Square wave   (B) Triangular wave
       (C) Trapezoidal wave   (D) Sinusoidal wave

99.   In order to simplify the design of a converter transformer, the two converters in a dual
       converter should be connected using:
       (A) Series connection   (B) Cross connection
       (C) Direct anti-parallel connection   (D) Anti-parallel connection

100.   An integral cycle ac voltage controller is feeding a purely resistive circuit from a single phase
       ac voltage source. The current waveform consists alternately burst of N-complete cycle of
       conduction followed by M-complete cycles of extinction. The rms value of the load voltage
       equals the rms value of the supply voltage for:
       (A) N = M   (B) N = 0   (C) N = M = 0   (D) M = 0

Directions: -

       Each of the next Twenty (20) items consists of two statements, one labeled as the 'Assertion
       (A)' and the other as 'Reason (R)'. You are to examine these two statements carefully and
       select the answers to these items using the codes given below:

Codes:

       (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

101.   **Assertion** (A)   :   In a certain case, a dc shunt generator failed to build up the
                                       voltage.
       Reason (R)   :   Shunt field resistance of a dc shunt generator should be more than
                                       its critical field resistance value to generate voltage.

102. **Assertion** (A)   :   While running on light load a salient pole synchronous machine can continue to operate on infinite bus-bars even if its excitation fails.

      Reason (R)   :   A salient pole machine develops reluctance power due to the variable reluctance offered by the salient poles.

103. **Assertion** (A)   :   A squirrel cage induction motor is preferred to the slip ring induction motor.

      Reason (R)   :   Higher starting torque is the main consideration.

104. **Assertion** (A)   :   If two transformers with different $\dfrac{X}{R}$ ratios are operated in parallel, one of the transformers becomes overheated when full KVA output is drawn from them.

      Reason (R)   :   The impedance triangles are not identical in shape when two transformers having different voltage rating are operated in parallel.

105. **Assertion** (A)   :   In a certain case of load change, an alternator became unstable and pulled-out.

      Reason (R)   :   In an alternator, damper winding is present.

106. **Assertion** (A)   :   It is not necessarily desirable to compensate by a series capacitance for all the line reactance.

      Reason (R)   :   Power can be transformed only if reactance is present.

107. **Assertion** (A)   :   The collector current in a BJT in common base mode increases slightly with increase in collector-base voltage.

      Reason (R)   :   Increased collector – base bias causes avalanche breakdown to increase the current.

108. **Assertion** (A)   :   In a p-type semi-conductor, with increase in the level of doping at a fixed temperature, the hole concentration increases but the electron concentration falls.

      Reason (R)   :   Law of mass action holds good in case of semi-conductors.

109. **Assertion** (A)   :   For class A operation of CE transistor amplifier, the operating point cannot be fixed near $V_{CE} = 0$ point.

      Reason (R)   :   During the positive half of the input cycle, the transistor may be driven from 'active' region to 'saturation' region, thus loosing the class A wave shape in the output.

110. **Assertion** (A)   :   If the output voltage waveform in a transistor amplifier is a true replica of the input waveform, then it is said to be operated in class A mode. The Q point cannot be fixed near $I_C = 0$

      Reason (R)   :   The positive half cycle of the input will be clipped off in the output due to transistor being driven into cut-off from active region.

111. **Assertion** (A)   :   At 0ºK, a semiconductor behaves as an insulator,
      Reason (R)   :   No free carriers are available in the semiconductor at 0^Ok.

112. **Assertion** (A)   :   In a full-wave rectifier, it is absolutely necessary to use identical diodes having identical characteristics.
      Reason (R)   :   In practice, it is never possible to have two diodes having identical characteristics due to technological limitations.

113. **Assertion** (A)   :   The operating point in a transistor amplifier shifts with changes in temperature.
      Reason (R)   :   Reverse saturation current approximately doubles for every 10^OC increase in temperature

114. **Assertion** (A)   :   In the work function model of Schottky barrier diode contacts to n-type semiconductor, the metal work function will be higher than the semi-conductor work function.
      Reason (R)   :   To equalize the Fermi levels on the ferro sides of the contact, electrons from semiconductor surface move to metal side forming a space charge region at the semiconductor surface.

115. **Assertion** (A)   :   The energy band diagram of a real semiconductor cannot be represented by flat conduction and valence bands.
      Reason (R)   :   The presence of energy states in the forbidden energy gap results in carrier trapping, giving rise to finite curvature in the bands.

116. **Assertion** (A)   :   Instruction SIM is necessary to implement the interrupts INTR.
      Reason (R)   :   INTR requires external hardware for implementation.

117. **Assertion** (A)   :   STACK is used to temporarily store the data in RAM locations specified by the programmer in main program.
      Reason (R)   :   PUSH and POP instructions are used to send or retrieve the data from the STACK.

118. **Assertion** (A)   :   Coherent FSK system is preferred to non-coherent FSK.
      Reason (R)   :   Coherent FSK requires less power than non-coherent FSK.

119. **Assertion** (A)   :   In the FM receiver discriminator, both the sum of the voltages and ratios of the voltages are independent of frequency.
      Reason (R)   :   The diodes face the same direction and the discriminator requires a limiter to reject amplitude changes of the carrier voltage.

120. **Assertion** (A)   :   In the power line communication, carrier frequency is chosen between 50kHz and 500kHz
      Reason (R)   :   No extra lines are necessary for the purpose and the same lines are used to carry both the electrical power and information by carriers.