

AJK MASS COMMUNICATION RESEARCH CENTRE



Admission test paper

P.G. Diploma in Broadcast System Maintenance 2007

Total Marks: 85

Time: 2:00 hours

Instructions

Please read the following instructions **CAREFULLY** before you begin answering the question.

1. Write your Roll. No in the space marked for it on the answer sheet.
2. Do not write your name on the answer sheet
3. The question paper has two **SECTIONS** (A & B). In **SECTION 'A'** each question carry one mark. The marking in Section-'B' has been shown against the questions.

SECTION- A

1. In which material do conduction and balance bands overlap
 - a) insulators
 - b) conductors
 - c) both conductors and semiconductors
 - d) semiconductors

2. The number of valence electrons in a silicon atom is
 - a) four
 - b) two
 - c) one
 - d) zero

3. The voltage at which avalanche occurs is known as
 - a) Cut in voltage
 - b) Barrier voltage
 - c) Breakdown voltage
 - d) Depletion voltage

4. A silicon diode is forward biased and total applied voltage is 5V. The voltage across p-n IS
 - a) 5 V
 - b) Slightly less than 5V
 - c) 0.7V
 - d) Zero

5. Which of the following is basically a voltage controlled capacitance
 - a) Zener diode
 - b) Diode
 - c) Varactor diode
 - d) LED

6. In a Zener diode
 - a) The forward current is very high
 - b) Sharp breakdown occurs at a certain reverse voltage
 - c) The ratio V / I can be negative
 - d) There are two p-n junctions

7. When a p-njunction is reversed biased
 - a) Holes and electrons move away from the junction
 - b) Holes and electrons move towards the junction
 - c) Holes move towards junction and electrons move away from junction
 - d) Holes moves away from junction and electrons move towards junction

8. A diode is operating in forward region and the forward voltage and current are $V = 3 + 0.3 \sin \omega t$ Volts and $i = 5 + 0.2 \sin \omega t$ mA. The average power dissipated is
- 15 mW
 - About 15mW
 - 1.5 mW
 - About 1.5 m W
9. In an n-p-n transistor the majority carriers in the base are
- electrons
 - holes
 - both holes and electrons
 - either holes or electrons
10. In a bipolar transistor, the emitter base junction has
- Forward bias
 - Reverse bias
 - Zero bias
 - Zero or reverse bias
11. In which condition does BJT behaves like a closed switch
- cut-off
 - saturation
 - active
 - both (b) & (c)
12. In a bipolar junction transistor $\alpha_{dc} = 0.98$, $I_{co} = 211A$ and $I(b) = 1511A$. The collector current I_c is
- 63511A
 - 73511A
 - 83511A
 - 93511A
13. In a p-n-p transistor operating in forward active mode
- Base is positive w.r.t emitter and collector
 - Base is negative w.r.t emitter and collector
 - Emitter is positive w.r.t base and base is positive w.r.t collector
 - Emitter is negative W.Lt base and base is positive W.r.t collector
14. In a schematic representation of BJT the direction of arrow shows the direction of flow of
- holes
 - electrons
 - holes in p-n-p and electrons in n-p-n
 - electrons in p-n-p and holes in n-p-n

15. When the gate terminal of MOSFET is positive, it is said to operate in
 - a) Depletion mode
 - b) Conduction mode
 - c) Enhancement mode
 - d) None of the above
16. The channel of JFET consist of
 - a) P type material
 - b) N type material
 - c) Conducting material
 - d) Either P or N type material
17. In a JFET the width of channel is controlled by
 - a) Gate voltage
 - b) Drain current
 - c) Source current
 - d) All the above
18. The word enhancement mode is associated with
 - a) Tunnel diode
 - b) MOSFET
 - c) JFET•
 - d) Photo diode
19. Which quantity controls the effectiveness of LED in emitting light
 - a) Applied voltage
 - b) current
 - c) extent of doping
 - d) temperature
20. When a BJT is operated under saturated condition
 - a) Both junctions are forward biased
 - b) Both junctions are reverse biased
 - c) CB junction is forward biased and EB junction is reverse biased
 - d) EB junction is forward biased and CB junction is reverse biased
21. Gold is often diffused in to silicon p-n junction devices to
 - a) Increase recombination rate
 - b) Reduce recombination rate
 - c) Make silicon semimetal
 - d) None of the above
22. In a Piezo-electric crystal, application of a mechanical stress would produce
 - a) Plastic deformation of the crystal
 - b) Magnetic dipoles in the crystal
 - c) Electric polarization in the crystal
 - d) Shift in the Fermi layer

23. A resistor is rated at 0.75 Watt, 1k Ω . Its current rating is
- 1 mA
 - 27.386 mA
 - 1.268 mA
 - 5.393 mA
24. Ohms law is valid for
- DC voltage and current
 - AC voltage and current
 - All voltages and currents
 - DC and AC voltages and currents
25. As the diameter of a wire is doubled, the resistance becomes
- Twice
 - One half
 - One fourth
 - Four times
26. Two resistances of 2 ohm each are connected in series. A shunt having zero resistance is connected across the combination. The overall resistance will be
- 4 ohms
 - 1 ohms
 - 0.5 ohms
 - Zero
27. If a sheet of mica is inserted between the plates of an air capacitor, the capacitance
- Will increase
 - Will remain the same
 - Will decrease
 - May increase or decrease
28. Which of the following is not electromagnetic in nature
1. a-rays 2. X-rays
 3. y-rays 4. Cathode rays
- 1 & 2
 - 2 & 3
 - 3 & 4
 - 1 & 4
29. For measuring mutual inductance we can use
- Anderson bridge
 - Maxwell's bridge
 - Heaviside bridge
 - Either (a) or (b)

30. If in a transformer the secondary turns are doubled and at the same time the primary voltage is reduced by half, then the secondary voltage will be
- Halved
 - Four times as high
 - Not change
 - Reduced to quarter
31. As compared to an amplifier, a transformer cannot
- Increase the output voltage
 - Increase the output current
 - Increase output power
 - None of the above
32. The transformer is commonly used because
- It has high efficiency
 - Frequency remains constant
 - Construction cost per k V A is less as compared to other machines
 - All of these
33. Permittivity has the units
- Farads/metre
 - Coulombs/metre
 - Farads/metre²
 - Coulombs/metre²
34. Transformer works on the principle of
- Self induction
 - Mutual induction
 - Faraday's law of electro magnetic induction
 - Self and mutual induction both
35. An electric charge in uniform motion produces
- Magnetic field
 - Electric field
 - No such field at all
 - Both electric and magnetic field
36. Which electromagnetic radiations are used for viewing the objects through haze and fog
- Infra-red
 - Ultraviolet
 - Both
 - None of the above

37. Which of the following statements about induction motor is true
- The motor can run only in one direction
 - The laminations of the rotor should be properly insulated against one another
 - The cage rotor is made of copper
 - The stator winding produces a rotating magnetic field
38. Which of the following formulae is used to calculate the synchronous speed of an induction motor
- $N_s = P \times f$
 - $N_s = 120 \times P / f$
 - $N_s = 120 \times f / P$
 - $N_s = f \times P / 60$
39. Which of the following appliance will offer the maximum load
- Toaster
 - Refrigerator
 - Hot plate
 - Electric bell
40. A booster is connected in
- Series with feeder
 - Parallel with feeder
 - Both (a) and (b) are correct
 - None of the above
41. Two parallel wires carrying current in the same direction attract each other because of
- Mutual inductance
 - Electric forces
 - Potential difference
 - Magnetic forces
42. Generator converts
- Mechanical energy into electrical energy
 - Electrical energy into mechanical energy
 - Both of them
 - None of the above
43. Which of the following is the desirable property of resistance heating element materials
- High resistivity
 - High melting point
 - Low temperature coefficient
 - All of the above

44. Which method of heating is likely to give leading power factor
- a) Electric arc
 - b) Induction heating
 - c) Dielectric heating
 - d) Resistance heating
45. The number of digits in hexadecimal system is
- a) 15
 - b) 16
 - c) 10
 - d) 8
46. Ie's are
- a) analog
 - b) digital
 - c) both analog & digital
 - d) mostly analog
47. Hexadecimal number E is equal to binary number
- a) 1110
 - b) 1101
 - c) 1001
 - d) 1111
48. Binary 100101 is equal to decimal number
- a) 47
 - b) 37
 - c) 27
 - d) 17
49. The binary addition $1 + 1 =$
- a) 11
 - b) 10
 - c) 111
 - d) 100
50. Binary multiplication 1×0
- a) 1
 - b) 0
 - c) 10
 - d) 11
51. 1's complement of 11100110 is
- a) 00011001
 - b) 10000001
 - c) 00011010
 - d) 00000000

52. The parity bit is
- a) always 1
 - b) always 0
 - c) 1 or 0
 - d) none of the above
53. Which of these are universal gates
- a) only NOR
 - b) only NAND
 - c) both NOR & NAND
 - d) NOR,NAND,OR
54. Boolean algebra obeys
- a) commutative law
 - b) associative law
 - c) distributive law
 - d) commutative law, associative law and distributive law
55. A half adder can be used only for adding
- a) 1s
 - b) 2s
 - c) 4s
 - d) 8s
56. It is desired to route data from many registers to one register. The device needed IS
- a) decoder
 - b) multiplexer
 - c) demultiplexer
 - d) counter
57. A mod 4 counter will count
- a) from 1 to 4
 - b) from 0 to 3
 - c) from any number n to $n+4$
 - d) none of the above
58. The basic storage element in a digital system
- a) flip flop
 - b) counter
 - c) multiplexer
 - d) encoder

59. A NOR gate is a combination of
- a) OR and NAND gate
 - b) AND and NOT gate
 - c) OR and NOT gate
 - d) two NOT gates
60. The output of a full adder is
- a) SUM•
 - b) CARRY
 - c) SUM & CARRY
 - d) none of the above
61. A binary adder has
- a) one half adder
 - b) one half adder and 2 full adders
 - c) two half adders
 - d) one half adder and many full adders
62. An Op amp has
- a) low input & output impedance
 - b) low input & high output impedance
 - c) low output & high input impedance
 - d) high output & high input impedance
63. An SR flip flop can be built using
- a) NOR gate only
 - b) NAND gate only
 - c) either (a) or (b)
 - d) neither (a) nor (b)
64. To count 1000 bottles in a milk plant, the minimum no. of flip flops required is
- a) 12
 - b) 10
 - c) 8
 - d) 6
65. The inputs to logic gate are 0. The output is 1. The gate is
- a) NAND or XOR
 - b) OR or XOR
 - c) AND or XOR
 - d) NOR or Ex-NOR

66. Heat sink results in
- a) Slower dissipation of heat to atmosphere
 - b) Faster dissipation of heat to atmosphere
 - c) Lower ambient temperature
 - d) Lower transistor power
67. If input frequency is 50 Hz, the frequency of the output wave in a full wave diode rectifier circuit is
72. The purpose of earthing electric appliances is
- a) To provide safety against shock
 - b) To ensure that appliance works satisfactory
 - c) To ensure that appliance gets full voltage
 - d) All the above
73. In a network
- a) The number of tree branches is always less than the number of links
 - b) The number of tree branches is always more than the number of links
 - c) Number of tree branches and links are always equal
 - d) The number of tree branches has no relation with the number of links
74. In NTSC system the number of lines are
- a) 525
 - b) 720
 - c) 1080
 - d) 625
75. Hz is the unit of
- a) Power
 - b) Frequency
 - c) Ratio
 - d) Current

SECTION-B

Q.1: Write in 300 words about your desire to become a broadcast engineer, the skill and experience you would like to acquire, and why do you think this Diploma Course is right programme for you?

(4 Marks)

Q.2: Write short note on any three of the following in about 100 words each:

(i) Concept of preventive maintenance. (ii) Communication Satellite

(iii) Analog & Digital technology (iv) Fibre Optics

(v) Super Conductivity (vi) Ohms Law

(6 Marks)
