OCET 2011

Sr. No. :

Question Booklet Series : A

Important : Please consult your Admit Card / Roll No. Slip before filling your Roll Number on the Test Booklet and Answer Sheet.

Roll No. *In Figures* *In Words*

O.M.R. Answer Sheet Serial No.

Signature of the Candidate : _____

Paper : I

Subject : M.Tech. (Instrumentation)

Time : 90 minutes **Number of Questions : 75** **Maximum Marks : 75**

DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO

INSTRUCTIONS

1. Write your Roll No. on the Question Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Subject and Series Code of Question Booklet on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point / Black Gel pen.**
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. To open the Question Booklet remove the paper seal (s) gently when asked to do so.
5. Please check that this Question Booklet contains **75** questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of test.
6. Each question has four alternative answers (A, B, C, D) of which only one is correct. For each question, darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point / Black Gel pen.**
7. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Sheet. No marks will be deducted in such cases.
8. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the questions given in the Question Booklet.
9. If you want to change an already marked answer, erase the shade in the darkened bubble completely.
10. Negative marking will be adopted for evaluation i.e., 1/4th of the marks of the question will be deducted for each wrong answer. A wrong answer means incorrect answer or wrong filling of bubble.
11. For calculations, use of simple log tables is permitted. Borrowing of log tables and any other material is not allowed.
12. For rough work only the sheets marked "Rough Work" at the end of the Question Booklet be used.
13. The Answer Sheet is designed for **computer evaluation**. Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e., not following the instructions completely, shall be of the candidate only.**
14. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
15. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so, would be expelled from the examination.
16. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistance or found giving or receiving assistance or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent/Observer whose decision shall be final.
17. **Telecommunication equipment such as pager, cellular phone, wireless, scanner, etc., is not permitted inside the examination hall. Use of calculators is not allowed.**

1. What is maximum data capacity for optical fiber cable ?

(A) 10 mbps (B) 100 mbps

(C) 1000 mbps (D) 10000 mbps

2. What is the central device in star topology in computer networking ?

(A) STP server (B) Hub/Switch

(C) PDC (D) Router

3. The number of digits in Hexadecimal system is :

(A) 15 (B) 17

(C) 16 (D) 8

4. For large networks _____ topology is used.

(A) Bus (B) Star

(C) Ring (D) Delta

5. ISO stands for :

(A) International Standard Organization (B) International Student Organization

(C) Integrated Services Organization (D) International Service Organization

6. Resistivity of silicon in ohms cm is approx. equal to :

(A) 50 K (B) 1012 ohm

(C) 230 K (D) 10-6 ohm

7. A Kb corresponds to :

(A) 1024 bits (B) 1000 bytes

(C) 1048 bytes (D) 948 bits

8. The forbidden energy gap for silicon is :

(A) 1.1 eV (B) 067 eV

(C) 0.97 eV (D) 1.7 eV

9. Impurity atoms that produces N type material by its addition in semiconductor is called :

(A) Donor (B) Acceptor

(C) Conductor (D) Insulator

10. IC 8085 is a :

(A) Microcontroller (B) Microprocessor

(C) Micromemory (D) Arithmetic Logic Unit

11. Point contact diodes are preferred at very high frequency, because of its low junction :

(A) Capacitance and inductance (B) Inductance

(C) Capacitance (D) Mobility

12. Another name for horizontal retrace in TV receiver is the :

(A) Ringing (B) Burst

(C) Damper (D) Fly back

13. Another name for the colour sync in the colour TV system :

(A) Ringing (B) Burst

(C) Damper (D) Fly back

14. In a transistor if Alpha = 0.98, current gain is equal to :

(A) 29 (B) 59

(C) 69 (D) 49

15. The active region in the common emitter configuration means :

(A) Both collector and emitter junction is reverse biased

(B) The collector junction is forward biased and emitter junction

(C) The collector junction is reverse biased and emitter junction is forward biased

(D) Both collector and emitter junction are forward biased

16. In an amplitude modulated signal, lower side band frequency is equal to if the carrier frequency is fc and modulation frequency is fm :

(A) fm + fc (B) fc – fm

(C) fm r fc (D) fc/fm

17. Modulation index of the frequency modulation depends on :

(A) Amplitude and frequency of the modulation signal

(B) Frequency and amplitude of carrier signal

(C) Carrier frequency

(D) None of these

18. Reverse saturation current of a Ge diode is in the range of :

(A) mA (B) uA

(C) nA (D) pA

19. Every 10°C rise in temperature the reverse saturation current of diode :

(A) Doubles (B) Halves

(C) Triples (D) No change

20. A Metal or Semiconductor carrying a current I is placed in a transverse magnetic field B, an electric field E is induced in :

(A) Parallel to B
(B) Prependicular to I
(C) Perpendicular to both B and I
(D) Prependicular to B

21. 1 eV (electron volt) is equal to :

(A) 6.23×10^{-20} J
(B) 1.6×10^{-19} J
(C) 6.23×10^{-18} J
(D) 1.16×10^{-19} J

22. Germanium has the valency of :

(A) 2
(B) 3
(C) 4
(D) 5

23. Hole acts as a free charge carrier of polarity :

(A) Negative
(B) Positive
(C) Neutral
(D) Depends on temperature

24. Notch filter is :

(A) Low pass filter
(B) High pass filter
(C) Narrow stop band filter
(D) Narrow pass band filter

25. The characteristics of FET are similar to :

(A) Triode
(B) Tertode
(C) Pentode
(D) Diode

26. Charge coupled device is an array of capacitors whose structure is similar to :

(A) Shift register
(B) Flip-flop
(C) NAND gate
(D) Amplifier

27. Operational amplifier characteristics are which of the following ?

(A) Infinite gain
(B) Low input impedance
(C) Output impedance equal to output impedance
(D) Inifinite output impedance

28. The important application of Schmitt trigger is :

(A) To convert slowly varying input voltage to abrupt voltage change
(B) To convert abruptly varying input voltage into slowly varying output
(C) To change the frequency of the input
(D) None of these

29. **Meaning of decoding is :**

(A) Binary addition (B) Data transmission

(C) Demultiplexing (D) Storage of binary information

30. **The important use of low pass filter in power supply is :**

(A) To get the regulation in the output voltage (B) To filter out the ripple frequency

(C) To increase the current rating (D) To convert AC into DC

31. **Binary equivalent of the decimal number 145 is :**

(A) 10010001 (B) 1001011

(C) 1010001 (D) 1100010

32. **In which of the following gate the output will be high when all the inputs are at high level ?**

(A) NOR (B) AND

(C) NAND (D) EXOR

33. **Four bit code is called :**

(A) Nibble (B) Byte

(C) Word (D) Register

34. **Analog signal varies with :**

(A) sampling time (B) time continuously

(C) sampling frequency (D) none of these

35. **In amplitude modulation, frequency is :**

(A) constant (B) zero

(C) variable (D) one

36. **The frequency range of 1 GHZ to 30 GHZ are referred as :**

(A) sound waves (B) micro waves

(C) mini waves (D) UV waves

37. **Low pass filter attenuates :**

(A) high frequencies (B) low frequencies

(C) medium frequencies (D) low and medium frequencies

38. **Micro wave communication is used in :**

(A) ISDN (B) Mobile telephone networks

(C) Industries computer networking (D) Fiber optic telephones

39. Optical detector is :

(A) Light emitting diode
(B) PIN photo diode
(C) BJT
(D) MOSFET

40. Optical fibre is fabricated with :

(A) glass
(B) copper
(C) aluminium
(D) rubber

41. Primary colours are :

(A) red, blue, green
(B) green, white, blue
(C) blue, red, yellow
(D) green, magenta, cyan

42. Respiratory volume is measured using :

(A) Myograph
(B) Pneumograph
(C) Spiro meter
(D) Goniometer

43. Piezo-electric materials have _____ resistivity.

(A) Zero
(B) Infinite
(C) Finite
(D) Null

44. One of the combination of materials used for optical fibers are _____.

(A) Copper core and glass cladding
(B) Glass core and aluminium cladding
(C) Glass core and plastic cladding
(D) Plastic core and glass cladding

45. An operational amplifier is a :

S1 : Direct coupled high gain amplifier

S2 : Device to perform linear operation

(A) S1 is true and S2 is false
(B) S2 is true and S1 is false
(C) Both S1 and S2 are true
(D) Both S1 and S2 are false

46. Power supply rejection ratio of an OPAMP should be :

(A) Ideally unity
(B) Zero
(C) As small as possible
(D) As large as possible

47. The ideal value of CMRR is :

(A) 1
(B) 0
(C) $-\infty$
(D) ∞

48. DC amplifiers are generally :

S1 : Negative feedback type

S2 : Positive feedback type

(A) S1 is true and S2 is false

(B) S2 is true and S1 is false

(C) Both S1 and S2 are true

(D) Both S1 and S2 are false

49. MRI makes use of the _____ region of the electromagnetic spectra to provide an image.

(A) Ultra Violet Frequency

(B) Radio Frequency

(C) Infra Red Frequency

(D) Ultra High Frequency

50. Ultrasound is a form of energy which consists of :

S1 : Mechanical vibrations of high frequency

S2 : Electrical vibrations of high frequency

(A) S1 is true

(B) S2 is true

(C) S1 and S2 are true

(D) S1 and S2 are false

51. The use of super conducting magnets in MRI is to obtain :

(A) Signals from surface tissue

(B) High RF field

(C) High strength gradient fields

(D) High strength magnetic fields

52. A current carrying coil is subjected to a uniform magnetic field. The coil will orient so that its plane becomes :

(A) inclined at 45º to the magnetic field

(B) inclined at any arbitrary angle to the magnetic field

(C) parallel to the magnetic field

(D) perpendicular to magnetic field

53. Tesla is the unit of :

(A) magnetic flux

(B) magnetic field

(C) magnetic induction

(D) magnetic moment

54. The total charge induced in a conducting loop moving in magnetic field depends upon :

(A) the rate of change of magnetic flux

(B) initial magnetic flux only

(C) the total change in magnetic flux

(D) final magnetic flux only

55. A uniform magnetic field acts right angles to the direction of motion of electrons. As a result, the electron moves in a circular path of radius 2 cm. If the speed of electrons is doubled, then the radius of the circular path will be :

(A) 2.0 cm

(B) 0.5 cm

(C) 4.0 cm

(D) 1.0 cm

56. To convert a galvanometer into an ammeter, one needs to connect a :

(A) low resistance in parallel (B) high resistance in parallel

(C) low resistance in series (D) high resistance in series

57. When a proton is accelerated through I V, then its kinetic energy will be :

(A) 930 eV (B) 13.6 eV

(C) 1 eV (D) 0.54 eV

58. If a diamagnetic substance is brought near north or south pole of a bar magnet, it is :

(A) attracted by the poles

(B) repelled by the poles

(C) repelled by north pole and attracted by the south pole

(D) attracted by the north pole and repelled by the south pole

59. There are _____ Bravais Lattices of Crystal.

(A) 4 (B) 7

(C) 14 (D) 16

60. The conductivity of a semiconductor crystal due to any current carrier is not proportional to :

(A) mobility of the carrier (B) effective density of states in the conduction band

(C) electronic charge (D) surface states in the semiconductor

61. An SSi Chip has _____ logic gates on it.

(A) less than 4 (B) less than 12

(C) more than 12 but less than 100 (D) less than 1000 but more than 100

62. Which one of the following is an essential components of electromechanical relays ?

(A) Graphite rod (B) SCR

(C) Electromagnet (D) MOSFET

63. Which of the following is a non-polar dielectric ?

(A) Polystyrene (B) Phenolic plastics

(C) Plasticized cellulose acetate (D) Castor oil

64. The impurity in liquid dielectric which has significant effect in reducing the breakdown strength, is :

(A) dust (B) dissolved gases

(C) moisture (D) ionic impurities

65. Van de Graaff generators are useful for :

(A) Very high voltage and low current applications

(B) Very high voltage and high current applications

(C) Constant high voltage and current applications

(D) High voltage pulses only

66. Switching surge is :

(A) high voltage dc

(B) high voltage ac

(C) short duration transient voltage

(D) hyperbolically dying voltage

67. In 'plasma' state a gas :

(A) loses electrical conductivity

(B) conducts electricity

(C) becomes perfect insulator

(D) attracts moisture

68. Fleming's left hand rule may be applied to an electric generator to find out :

(A) direction of rotor rotation

(B) polarity of induced emf

(C) direction of induced emf

(D) direction of magnetic field

69. A language in which a statement in a loop that runs 100 times and is decoded 100 times, is :

(A) BASIC

(B) FORTRAN

(C) COBOL

(D) PASCAL

70. Which of the following is not a high level computer programming language ?

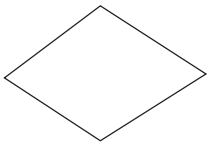
(A) FORTRAN

(B) MODEM

(C) COBOL

(D) ALGOL

71. The symbol shown in the figure in flow chart represents :



(A) Input

(B) Output

(C) Decision

(D) Termination

72. The voltage levels for a Zero logic in a digital system :

(A) must necessarily be negative

(B) could be negative or positive

(C) must necessarily be positive

(D) must necessarily be either zero or –5 V

73. Which logic circuit is the fastest ?

(A) TTL (B) DTL

(C) RTL (D) All have same speed

74. Which of the following sets represents a universal logic family ?

(A) NAND (B) XOR

(C) NAD (D) None of the above

75. The maximum propagation value in case of 7400 NAND gates is :

(A) 1 second (B) 20 milli seconds

(C) less than 20 nano seconds (D) less than 20 pico seconds

ROUGH WORK