Seat No.

Total No. of Pages : 24

M.Sc. Entrance Examination 2024

Electronics

Subject Code : 58298

Day and Date : Monday, 29-07-2024 **Total Marks : 100**
Time : 02.30 pm to 04.00 pm

Instructions :

1) All questions are compulsory.
2) Each question carries 1 mark.
3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
4) Follow the instructions given on OMR sheet.
5) Rough work shall be done on the sheet provided at the end of question paper.

1. Thevenin's network gives an equivalent network in ..... form

   A) shunt B) series

   C) ladder D) T

2. ..... is used to detect optical signal.

   A) Zener diode B) Gunn diode

   C) Light emitting diode D) Photodiode

3. Capacitive reactance is given by Xc = ...

   A) $1/2\pi fC$ B) $1/\pi fC$

   C) $2\pi fC$ D) πfC

4. In full wave rectification, if the input frequency is 50 Hz, then output frequency is ..... Hz.

A) 25 B) 50

C) 100 D) 200

5. Forward biased diode offers ..... resistance.

A) zero B) very low

C) very high D) infinite

6. The binary equivalent of $(FE)_{16}$?

A) 1111 1010 B) 1111 1110

C) 1010 1111 D) 1110 1111

7. Which of the following is universal gate?

A) AND B) NAND

C) OR D) EX-OR

8. In 16 to 1 multiplexer, how many select lines are required?

A) 2 B) 3

C) 4 D) 5

9. A half-subtractor is an arithmetic circuit which performs subtraction on ..... input bits.

A) 2 B) 3

C) 4 D) 1

10. A decoder converts 'n' inputs to ..... outputs.

A) 2^n B) n

C) 2n D) 4n

11. In an *NPN* transistor the majority carriers in the emitter are.....

A) electrons B) holes

C) both A and B D) None of the above

12. Transistor amplifier which gives current gain ≈ 1 is.....

A) CE B) CB

C) CC D) None of the above

13. The input impedance of JFET.....

A) approaches zero

B) approaches one

C) approaches infinity

D) is impossible to predict

14. An oscillator always needs an amplifier with.....

A) positive feedback

B) negative feedback

C) both types of feedbacks

D) None of the above

15. What are the terminals of a UUT?

A) Emitter, Base and Collector

B) Gate, Drain and Source

C) Gate, Drain, Body and Source

D) Emitter, Base 1 and Base 2

16. Which of the following components is not typically found in a linear integrated circuit (IC)?

A) Operational Amplifier (Op-Amp)

B) Comparator

C) Microcontroller

D) Voltage Regulator

17. What is the primary function of a voltage regulator in a linear integrated circuit?

A) To amplify the input voltage

B) To compare two input voltages

C) To regulate and stabilize the output voltage

D) To generate a variable frequency signal

18. Which configuration is commonly used in operational amplifiers for amplification purposes?

A) Inverting amplifier

B) Schmitt trigger

C) Integrator

D) Voltage follower

19. In a JK flip-flop, what is the state of the output Q when both J and K inputs are reset (0)?

A) Q is set to 1 B) Q is reset to 0

C) Q toggles D) Q remains unchanged

20. What is the primary function of a flip-flop in digital circuits?

A) Data transmission

B) Memory storage

C) Arithmetic computation

D) Signal amplification

21. ..... is the noise temperature of the sun?

A. 100000 B. 8000

C. 100 D. 3000

22. ..... is equivalent to Henry.

A. Volts/Ampere

B. Weber/Ampere

C. Weber/Ampere2

D. None of these

23. ..... mumber of a career in a semiconductor.

A. 2 B. 8

C. 5 D. None of these

24. MICR stands for .....

A. Magnetic Ink Chart Receipt

B. Magnetic Ink Character Recognition

C. Magnetic Ink Chart Recognition

D. Magnetic Ink capacitor Reverse

25. one of the following semiconductor material?

A. copper B. silicon

C. iron D. None of these

26. MOV A, @ R1 will:

A) copy RI to the accumulator

B) copy the accumulator to R1

C) copy the contents of memory whose address is in R1 to the accumulator

D) copy the accumulator to the contents of memory whose address is in R1

27. The address bus width of a microprocessor which is capable of addressing 64 Kbytes of the memory is ..... ?

A) 8 bit B) 16 bit

C) 64 bit D) 4 bit

28. The interrupt vector address for TRAP is?

A) 00001 B) 0024H

C) 0018H D) 002CH

29. Which type of stack in 8085?

A) FIFO B) LIFO

C) LILO D) IFIFO

30. The number of bits needed to address 4K memory is?

A) 6 B) 8

C) 12 D) 16

31. TDMA is a multiple access technique that has

A) Different users in different time slots

B) Each user is assigned unique frequency slots

C) Each user is assigned a unique code sequence

D) Each signal is modulated with frequency modulation tech

32. Cellphone communication is .....

A) half duplex B)simplex

C) full duplex D) full simplex

33. FSK is abbreviated as .....

A) Frequency shift keying

B) Frequency side keying

C) Forward shift keying

D) All the above

34. ..... are utilized to allow synchronization of the receivers between different slots and frames.

A) Preamble B) Data

C) Guard bits D) Trail bits

35. Analog cellular phone is ..... generation technology.

A) IG B) 2G

C) 3G D) 4G

36. In 8051 microcontroller, Timer operating in mode 0, the timer register size is

A) 8 bit B) 13bit

C) 18bit D) 64bit

37 TFI, TRI, TFO, TRO bits are of which register ?

A) TMOD B) SCON

C) TCON D) SMOD

38. The asynchronous transmission always begins with.....

A) Start bit B) Stop bit

C) Parity bit D) Sync bit

39 How many data lines are there in a 16*2 alphanumeric LCD?

A) 16 B) 8

C) 1 D) 0

40. A stepper motor with a step angle of 15 degrees has ..... steps per revolution.

A) 72 B) 27

C) 24 D) 16

41. Thermocouple generate output voltage according to.....

A) Circuit parameters B) Humidity

C) Temperature D) Voltage

42. Strain gauge is a .....

A) inductive transducer

B) resistive transducer

C) capacitive transducer

D) mechanical transducer

43. Which of the following is an example of an active transducer?

A) Strain gauge B) LVDT

C) Thermocouple D) Photodetector

44. Which of the following is a digital transducer?

A) A Strain gauge

B) Encoder

C) Thermistor

D) LVDT

45. What is the principle of operation of LVDT?

A) Mutual inductance

B) Self-inductance

C) Permanence

d) Reluctance

46. Which type of temperature sensor works by measuring the change in electrical resistance of a metal wire as its temperature changes?

A) Thermocouple

B) Resistance Temperature Detector (RTD)

C) Thermistor

D) Mercury thermometer

47. With the increase in the intensity of light, the resistance of a photovoltaic cell

A) Increases

B) Decreases

C) Remains same.

D) None of these

48. Sensor provides output signal depending on .....

A) Input

B) Physical quantity

C) Both a and b

D) None of the above

49. The principle of operation of LVDT is based on the variation of

a) Self inductance

b) Mutual inductance

c) Reluctance

d) Permanence

50. Op-Amp as current to voltage converter is also called as .....

a) trans-impedance amplifier

b) trans-conductance amplifier

c) inverting amplifier

d) all of the above

51. What are the features of instrumentation amplifier?

a) Low noise

b) High gain accuracy

c) Low thermal and time drift

d) All of the mentioned

52. The knowledge of which parameter is sufficient for deriving the time varying electromagnetic field?

a. Electric field intensity

b. Magnetic field intensity

c. Current density

d. Power density

53. Wavefront is basically a locus of points acquiring similar .....

a. Phase
b. Frequency
c. Amplitude
d. Wave equation

54. In which kind of waveform is the phase velocity defined?

a. Sinusoidal
b. Rectangular
c. Square
d. Triangular

55. Power density is basically termed as ..... power per unit area

a. Reflected
b. Refracted
c. Radiated
d. Diffracted

56. Which ionization layer exists during day time & usually vanishes at night due to highest recombination rate?

a. D-region
b. Normal E-region
c. Sporadic E-region
d. Appleton region

57. The 8051 DPTR is ..... bit wide.

A) 4
B) 8
C) 14
D) 16

58. ..... interrupt has highest priority in 8051.

A) INTO
B) TO overflow
C) INTI
D) Serial

59. ..... is true about Parity flag of 8051.

A) There is no parity flag in 8051.

B) Parity flag is present in PSW SFR of 8051.

C) Zero flag is present in STATUS register of 8051.

D) All of these

60. The 8051 microcontroller supports ..... byte External RAM.

A) 32 B) 64

C) 128 D) 64K

61. Common-cathode configuration generally relates to ..... display.

A) 7-segment LED

B) 16*2 LCD

C) graphic LCD

D) all of the above

62. ADC0804 is .....

A) 1-channel 8-bit A-D Converter

B) 1-channel 8-bit D-A Converter

C) 8-channel 8-bit A-D Converter

D) 8-channel 8-bit D-A Converter

63. LM35 is a .....

A) analog temperature sensor

B) temperature and humidity sensor

C) digital temperature sensor

D) smart sensor

64. ..... is used to monitor microcontroller supply voltage level during operation.

A) INTO B) watch-dog timer

C) Brown-out detector D) RTC

65. The secondary breakdown occurs in .....

A) MOSFET B) BJT

C) MOSFET and BJT D) SCR

66. Three phase line voltage is ..... volts

A) 230 B) 300

C) 440 D) 120

67. The reverse recovery current in power diode depends upon .....

A) temperature

B) forward current

C) PIV

D) storage charge

68. The power BJT is a ..... controlled device.

A) current
B) voltage
C) power
D) none of these

69. ..... is a bidirectional device with three terminals.

A) SCR
B) DIAC
C) TRIAC
D) IGBT

70. The output voltage of an uncontrolled rectifier is always.....

A) positive
B) negative
C) constant
D) none of these

71. A ..... is an equivalent to two thyristor in antiparallel.

A) diode
B) SCR
C) BJT
D) TRIAC

72. The SMPS are superior to linear power supplies in respect of .....

A) noise and regulation
B) noise and cost
C) efficiency and regulation
D) size and efficiency

73. Which of the following is NOT a type of feedback sensor commonly used in rohotics?

A) Encoder

B) Gyroscope

C) Spectrometer

D) Potentiometer

74. Which type of sensor is commonly used in electronic instrumentation for measuring temperature?

A) Strain gauge

B) Thermocouple

C) Photodetector

D) Capacitive sensor

75. Which of the following statements about stepper motors used in robotics is true?

A) Stepper motors do not require a driver circuit for control.

B) Stepper motors provide precise control without the need for feedback sensors.

C) Stepper motors are typically used in applications requiring continuous rotation.

D) Stepper motors move in discrete steps, making them suitable for precise positioning.

76. Which of the following is NOT a common application of robotic arms?

A) Manufacturing

B) Surgery

C) Agriculture

D) Weather forecasting

77. Which of the following is NOT a primary component of a robotic arm?

A) Actuator B) Sensor

C) Controller D) Amplifier

78. Which type of sensor is commonly used in robotics to detect obstacles or proximity?

A) Ultrasonic sensor

B) Thermocouple sensor

C) pH sensor

D) Accelerometer sensor

79. Which of the following is NOT a type of actuator commonly used in robotics?

A) DC motor

B) Pneumatic cylinder

C) Laser diode

D) Servo motor

80. Which power electronic device is used for voltage regulation and reactive power compensation in power systems?

a) Diode
b) MOSFET
c) IGBT
d) SVC

81. Multimode step index fiber has .....

a) Large core diameter & large numerical aperture
b) Large core diameter and small numerical aperture
c) Small core diameter and large numerical aperture
d) Small core diameter & small numerical aperture

82. A typically structured glass multimode step index fiber shows as variation of attenuation in range of .....

a) 1.2 to 90 dB km^{-1} at wavelength 0.69μm
b) 3.2 to 30 dB km^{-1} at wavelength 0.59μm
c) 2.6 to 50 dB km^{-1} at wavelength 0.85μm
d) 1.6 to 60 dB km^{-1} at wavelength 0.90μm

83. Multimode step index fiber has a large core diameter of range is .....

a) 100 to 300 μm
b) 100 to 300 nm
c) 200 to 500 μm
d) 200 to 500 nm

84. Multimode graded index fibers are manufactured from materials with.....

a) Lower purity

b) Higher purity than multimode step index fibers.

c) No impurity

d) Impurity as same as multimode step index fibers.

85. The performance characteristics of multimode graded index fibers are.....

a) Better than multimode step index fibers

b) Same as multimode step index fibers

c) Lesser than multimode step index fibers

d) Negligible

86. Multimode graded index fibers with wavelength of 0.85μm have numerical aperture of 0.29 have core/cladding diameter of .....

a) 62.5 μm/125 μm

b) 100 μm/140 μm

c) 85 μm/125 μm

d) 50 μm/125μm

87. PIC 16Cxxx family supports ..... instructions.

A) 16 B) 35

C) 64 D) 128

88. The instructions of PIC 18Cxxx or 18Fxxx family are ..... bit wide.

A) 8 B) 12

C) 14 D) 16

89. ..... register of PIC microcontroller is used in indirect addressing.

A) WREG B) FSR

C) INDREG D) PTR

90. Most port pins of PIC microcontroller can drive ..... directly.

A) LED B) RELAY

C) MOTOR D) All of the above

91. PIC USART generates interrupt on .....

A) RX buffer empty and TX buffer full

B) TX buffer empty and RX buffer full

C) RI = 1 AND TI = 1

D) RI= 1 OR TI = 1

92. SPI is a .....

A) 1 wire interface

B) 2 wire interface

C) 3 wire interface

D) 4 wire interface

93. I2C offers ..... speed

A) <100 kbps
B) >400 kbps
C) >1 mbps
D) >100 mbps

94. ..... is not true.

A) ON-OFF control is a closed-loop control system
B) proportional control is an open-loop control system
C) PI control is a closed-loop control system
D) None of these

95. ..... is/are Continuous Control System.

A) ON-OFF control
B) proportional control
C) PI control
D) both B and C

96. The zero-crossing detector circuit typically uses.....

A) BJI
B) JFET
C) MOSFET
D) Op-amp

97. Op-amp is used in .....

A) ON-OFF control
B) proportional control
C) PI control
D) all of the above

98. ..... is an input device..

A) relay B) solenoid

C) sensor D) motor

99. ..... is not an electric actuator.

A) reed relay B) triac

C) servo motor D) limit switch

100. ..... is used in PLC programming.

A) Ladder diagram

B) ALP

C) HLL

D) none of these

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ROUGH WORK