

Seat No.

Total No. of Pages : 22

M.Sc. Entrance Examination 2026**M.Sc. Electronics****Sub. Code: 58298**

Day and Date : Tuesday, 12-May-2026**Total Marks : 100****Time : 01.00 PM TO 02.30 PM**

Instructions:

- 1) All questions are compulsory.
 - 2) Each question carries 1 mark.
 - 3) Rough work shall be done on the sheet provided at the end of question paper.
-

1. Which of the following is an active electronic component?

A) Transistor

B) Capacitor

C) Resistor

D) Inductor

2. Transformer works on the principle of

A) Self induction.

B) Mutual induction

C) Capacitance

D) Resistance

3. Ideal current source has

A) Infinite internal resistance

B) Zero internal resistance

C) High resistance

D) Variable resistance

4. Superposition is applicable only to

A) Linear circuits

B) Nonlinear circuits

C) Digital circuits

D) AC only

5. Depletion region contains
- A) electrons only
 - B) holes only
 - C) Immobile ions
 - D) Conducting electrons
6. The decimal equivalent of the hexadecimal number $(1011)_2$ is:
- A) 11
 - B) 12
 - C) 13
 - D) 14
7. NAND gate is called universal because
- A) It is fastest
 - B) It is cheapest
 - C) it can implement any logic function
 - D) It uses less power
8. SOP expression is formed using
- A) AND terms summed by OR
 - B) OR terms multiplied by AND
 - C) Only AND
 - D) Only OR
9. Sum output of half adder is
- A) AND
 - B) OR
 - C) NAND
 - D) XOR

25. What type of communication is used for underwater communication?
- A. Radio communication
 - B. Microwave communication
 - C. SONAR
 - D. Fiber optics
26. The 8085 microprocessor has a bit data bus and a bit address bus.
- a) 8, 16
 - b) 16, 8
 - c) 32, 16
 - d) 8, 8
27. Which register in 8085 holds the memory address of the next instruction?
- a) Stack pointer
 - b) Program counter
 - c) Accumulator
 - d) Flag register
28. Flag register in 8085 is of size:
- a) 4 bits
 - b) 8 bits
 - c) 16 bits
 - d) 32 bits
29. The instruction MVI A, 32H belongs to which category?
- a) Data transfer
 - b) Arithmetic
 - c) Logical
 - d) Branch
30. To mask lower nibble of accumulator, instruction is:
- a) ANI F0H
 - b) ANI 0FH
 - c) ORI F0H
 - d) XRI 0FH

31. According to the sampling theorem, the minimum sampling rate must be
- a) Equal to the signal frequency
 - b) Twice the highest signal frequency
 - c) Half the signal frequency
 - d) Four times the signal frequency
32. PWM stands for:
- a) Pulse Width Modulation
 - b) Phase Width Modulation
 - c) Pulse Wave Modulation.
 - d) Phase Wave Modulation
33. Detection of PAM signals is done using:
- a) Envelope detector
 - b) Low-pass filter
 - c) Phase detector
 - d) Frequency discriminator
34. FDM stands for:
- a) Frequency Division Multiplexing
 - b) Frequency Domain Modulation
 - c) Frequency Data Multiplexing
 - d) Frequency Delay Modulation
35. IMEI stands for:
- a) International Mobile Equipment Identity
 - b) International Mobile Encryption Identity
 - c) Internal Mobile Equipment Identity
 - d) International Mobile Exchange Identity

41. Accuracy of an instrument means:
- A) Repeatability
 - B) Closeness to true value
 - C) Speed of response
 - D) Sensitivity
42. LVDT stands for
- A) Linear Voltage Differential Transformier
 - B) Linear Variable Differential Transformer
 - C) Load Variable Differential Transformer
 - D) Linear Voltage Detector Transformer
43. Load cell measures
- A) Pressure
 - B) Force/Weight
 - C) Temperature
 - D) Speed
44. Thermocouple works on:
- A) Hall effect
 - B) Secheck effect
 - C) Piezoelectric effect
 - D) Photoelectric effect
45. Instrumentation amplifier is mainly used for:
- A) High noise signals.
 - B) Accurate low-level signal amplification
 - C) Oscillation
 - D) Clipping

46. PLL stands for:
- A) Phase Locked Loop
 - B) Pulse Locked Loop
 - C) Phase Logic Loop
 - D) Pulse Logic Loop
47. RTD stands for:
- A) Resistance Temperature Detector
 - B) Reactive Temperature Detector
 - C) Resistance Thermal Device
 - D) Reactive Thermal Detector
48. DAS stands for:
- A) Data Acquisition System
 - B) Digital Amplifier System
 - C) Data Amplification Setup
 - D) Dynamic Acquisition Signal
49. What is the wavelength of Super high frequency (SHF) especially used in Radar & satellite communication?
- a. 1m -10m
 - b. 1 cm -10 cm
 - c. 10 cm -1 m
 - d. 0.1 cm - 1 cm
50. Wave front is basically a locus of points acquiring similar
- a. Phase
 - b. Frequency
 - c. Amplitude
 - d. Wave equation
51. In which kind of waveform is the phase velocity defined?
- a. Sinusoidal
 - b. Rectangular
 - c. Square
 - d. Triangular

52. Which among the following is are not present in free space?
- a. Solid bodies
 - b. Ionized particles
 - c. Interference of normal radiation & radio wave propagation
 - d. All of the above
53. Power density is basically termed as power per unit area
- a. Reflected
 - b. Refracted
 - c. Radiated
 - d. Diffracted
54. If the path difference of two waves with single source traveling by different paths to arrive at the same point, is $\lambda/2$, what would be the phase difference between them?
- a. $B \times (\lambda/2)$
 - b. $B/(\lambda/2)$
 - c. $B+(\lambda/2)$
 - d. $B-(\lambda/2)$
55. 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

56. What is the possible range of height for the occurrence of sporadic F-region with respect to normal E-region?
- a. 20 km - 50 km
 - b. 45 km- 85 km
 - c. 90 km - 130 km
 - d. 140 km - 200 km
57.translates C code into the 8051 microcontroller machine code.
- A) Text Editor
 - B) Compiler
 - C) Debugger
 - D) Simulator
58. In 8051 C programming, data type is used to access a single bit of a bit-addressable SFR.
- A) unsigned char
 - B) str
 - C) sbit
 - D) int
59. is an advantage of C programming language compared to Assembly language, to write a program for 8051 microcontroller.
- A) Smaller hex file size
 - B) Easier to maintain and port to other microcontrollers
 - C) Faster execution speed
 - D) Direct control over every CPU register
60. In 8051 register is used to set the mode of operation for Timers.
- A) TCON
 - B) TMOD
 - C) SCON
 - D) IE

66. Which phenomenon in power diodes reduces power loss during forward conduction?
- a) Reverse recovery effect
 - b) Conductivity modulation
 - c) Avalanche breakdown.
 - d) Zener effect
67. What is the main purpose of a base drive circuit in a power transistor?"
- a) To control reverse recovery
 - b) To provide sufficient base current for switching
 - c) To limit collector-emitter voltage
 - d) To reduce drift layer resistance
68. Which characteristic makes power MOSFETs suitable for high-frequency switching?
- a) High input impedance
 - b) Low on-state resistance
 - c) Fast switching speed
 - d) All of the above
69. What is a key structural difference between an IGBT and a power MOSFET?
- a) IGBT has a gate oxide layer, MOSFET does not
 - b) IGBT has a p+ substrate layer, MOSFET does not
 - c) MOSFET has a collector terminal. IGBT does not
 - d) IGBT lacks a drift layer

70. Which device is best suited for high-voltage, high-current applications?
- a) Power transistor
 - b) Power MOSFET
 - c) CIGBT
 - d) Thyristor
71. In a thyristor, what triggers the turn-on process?
- a) High dv/dt
 - b) Gate current pulse
 - c) Reverse voltage
 - d) High di/dt
72. What is the main function of di/dt rating in a thyristor?
- a) To limit voltage spikes.
 - b) To prevent thermal runaway
 - c) To protect against rapid current rise
 - d) To ensure proper gate triggering
73. Which device is used to visually display waveturns in real-time?
- a) VDU
 - b) CRO
 - c) LCD
 - 4) Printer
74. What is the primary advantage of an LCD display over an LLD display?
- a) Higher power consumption
 - b) Lower power consumption
 - c) Brighter output
 - d) Limited viewing angle

75. What is the function of a spectrum analyzer?
- a) Measures pH levels
 - b) Analyzes frequency components of a signal
 - c) Records bioelectric potentials
 - d) Generates waveforms
76. Which component is central to a function generator using the 8038 IC ?
- a) Voltage-controlled oscillator
 - b) Microprocessor
 - c) Digital-to-analog converter
 - d) Spectrum analyzer
77. What is the primary purpose of instrument calibration?
- a) To increase power consumption
 - b) To ensure measurement accuracy.
 - c) To reduce display brightness
 - d) To amplify signals
78. Which mechanical component is used to convert rotational motion to translational motion?
- a) Gear train
 - b) Cam
 - c) Ratchet and pawl
 - d) Belt drive

79. What is an advantage of a brushless permanent magnet DC motor?
- a) Requires frequent maintenance
 - b) Higher efficiency and longer lifespan
 - c) Lower torque output
 - d) Complex control system
80. Electromagnetic waves travel through a vacuum at a speed of
- a) 1.5×10^8 ?/s
 - b) 3.0×10^8 ?/s
 - c) 2.2×10^8 ?/s
 - d) 4.0×10^8 ?/s
81. Phase velocity (v_p) is defined as
- a) The speed of energy transfer in a wave
 - b) The speed at which a wave's peaks propagate
 - c) The velocity of wave packets
 - d) The product of wavelength and group velocity
82. Which material is commonly used to produce LEDs emitting visible light?
- a) Silicon
 - b) Germanium
 - c) Gallium Arsenide Phosphide
 - d) Carbon
83. The process of light generation in a laser diode is known as:
- a) Spontaneous emission
 - b) Stimulated emission.
 - c) Absorption
 - d) Photoelectric effect.

84. In optoelectronic devices, "direct bandgap" semiconductors are preferred for light emission because:
- a) They have higher resistance
 - b) They allow electron-hole recombination to produce photons
 - c) They are cheaper
 - d) They are transparent
85. Who coined the term "Internet of Things?"
- a) Kevin Aston
 - b) John Wright
 - c) Edward Jameson
 - d) George Garton
86. When was the actual term "Internet of Things" coined?
- a) 1998
 - b) 1999
 - c) 2000
 - d) 2002
87. PIC microcontroller has architecture, which is characterized by having separate buses and memory spaces for instructions and data.
- A) CISC Architecture
 - B) Unified Architecture
 - C) Harvard Architecture
 - D) Von Neumann Architecture
88. flag in the STATUS register is affected when an arithmetic operation results in zero value.
- A) C (Carry flag)
 - B) OV (Overflow flag)
 - C) DC (Digit Carry flag)
 - D) Z (Zero flag)

89. The main difference between 12C and SPI protocols is
- A) SPI uses address-based slave selection
 - B) SPI is asynchronous, while 12C is synchronous
 - C) 12C is faster than SPI for all applications
 - D) 12C uses two wires (SDA/SCL) while SPI typically uses four (SDI/SDO/SCK/SS)
90. is true about the General Purpose RAM and EEPROM in PIC microcontroller.
- A) General Purpose RAM is non-volatile, while EEPROM is volatile
 - B) EEPROM is used to store the program code (instructions)
 - C) General Purpose RAM is used for temporary variables, while EEPROM stores data that must survive a power loss
 - D) General Purpose RAM can only be written to 100 times.
91. PIC18 instruction is used to move a literal (constant) value directly into the Working Register.
- A) MOVFF
 - B) MOVLW
 - C) MOVWF
 - D) MOVFW
92. To convert the ASCII character to the BCD value..... operation is required.
- A) Rotate Right 4 times
 - B) Subtract 0x30
 - C) Add 0x30
 - D) AND with 0x0F

93. The GOTO instruction of PIC microcontroller takes 2 instruction cycles instead of 1, because
- A) it performs an internal parity check
 - B) the pipeline must be flushed and reloaded with the new address
 - C) it needs to access the EEPROM
 - D) it is a 32-bit instruction that takes twice as long to fetch
94. In a manually controlled closed-loop system performs role of the 'controller'.
- A) the setpoint
 - B) the human operator
 - C) The control element
 - D) The sensor
95. An adaptive control system is unique because it has the ability to
- A) Automatically adjust its own controller parameters in real-time.
 - B) Run without a setpoint.
 - C) Switch between On and Off states only.
 - D) Operate without any power source.
96. In a PID controller,term is responsible for reducing overshoot and improving stability.
- A) Proportional (P)
 - B) Integral (I)
 - C) Derivative (D)
 - D) Any of these

97.places the capacitor at the input and the resistor in the feedback path.
- A) A Proportional Controller
 - B) An Integrator
 - C) A Differentiator
 - D) A Comparator
98. is designed for precise incremental motion and is commonly used in CNC machines and 3D printers.
- A) Stepper motor.
 - B) Solenoid.
 - C) Reed relay.
 - D) Thyristor.
99. The 'Isolators' (Opto-couplers) are used in PLC Input/Output modules,.....
- A) to increase the speed of the control logic.
 - B) to protect internal CPL circuitry from high-voltage spikes in the field.
 - C) to convert AC power into DC power for the CPU.
 - D) to store the PLC program during a power failure.
100. When a Logical AND' operation is performed on two 8-bit registers containing 11001100 and 10101010, the result 100 is
- A) 00000000
 - B) 10001000
 - C) 11101110
 - D) 01100110



ROUGH WORK