

# 10/2025

Question Booklet  
Alpha Code

**A**

Question Booklet  
Serial Number

**Total Number of questions : 100**

**Time : 1 Hour 30 Minutes**

**Maximum Marks : 100**

## INSTRUCTIONS TO CANDIDATES

1. The question paper will be given in the form of a Question Booklet. There will be four versions of question booklets with question booklet Alpha Code viz. A, B, C & D.
2. The Question Booklet Alpha Code will be printed on the top left margin of the facing sheet of the question booklet.
3. The Question Booklet Alpha Code allotted to you will be noted in your seating position in the Examination Hall.
4. If you get a question booklet where the Alpha Code does not match to the allotted Alpha Code in the seating position, please draw the attention of the Invigilator IMMEDIATELY.
5. The Question Booklet Serial Number is printed on the top right margin of the facing sheet. If your question booklet is unnumbered, please get it replaced by new question booklet with same Alpha Code.
6. The question booklet will be sealed at the middle of the right margin. Candidate should not open the question booklet, until the indication is given to start answering.
7. Immediately after the commencement of the examination, the candidate should check that the question booklet supplied to him/her contains all the 100 questions in serial order. The question booklet does not have unprinted or torn or missing pages and if so, he/she should bring it to the notice of the Invigilator and get it replaced by a complete booklet with same Alpha Code. This is most important.
8. A blank sheet of paper is attached to the question booklet. This may be used for rough work.
9. **Please read carefully all the instructions on the reverse of the Answer Sheet before marking your answers.**
10. Each question is provided with four choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and darken the bubble corresponding to the question number using Blue or Black Ball Point Pen in the OMR Answer Sheet.
11. **Each correct answer carries 1 mark and for each wrong answer 1/3 mark will be deducted. No negative mark for unattended questions.**
12. No candidate will be allowed to leave the examination hall till the end of the session and without handing over his/her Answer Sheet to the Invigilator. Candidates should ensure that the Invigilator has verified all the entries in the Register Number Coding Sheet and that the Invigilator has affixed his/her signature in the space provided.
13. Strict compliance of instructions is essential. Any malpractice or attempt to commit any kind of malpractice in the Examination will result in the disqualification of the candidate.

**A**

**DO NOT WRITE HERE**

1. What is the third step of the sequence order of PASS in fire extinguisher?  
(A) Squeeze (B) Sweep  
(C) Sharp (D) Sneeze
2. Which one is filled in halon fire extinguisher?  
(A) Carbon monoxide and carbon tetrachloride  
(B) Dry powder and bromochlorodifluoromethane  
(C) Carbon dioxide and bromochlorodifluoromethane  
(D) Bromochlorodifluoromethane and carbon tetrachloride
3. How much current is limited to in a neon tester?  
(A) 0.300 microampere  
(B) 30.0 microampere  
(C) 300 microampere  
(D) 3.00 microampere
4. What is the equation for producing torque in a coil of PMMC instrument?  
(A)  $T = BLIN$  Newton-metres  
(B)  $T = BLINr$  Newton-metres  
(C)  $T = BLALNr$  Newton-metres  
(D)  $T = BLAINr^2$  Newton-metres
5. How many electrons flow in one second in an ampere?  
(A)  $0.624 \times 10^{18}$  electrons flow per second  
(B)  $62.4 \times 10^{19}$  electrons flow per second  
(C)  $624 \times 10^{18}$  electrons flow per second  
(D)  $6.24 \times 10^{18}$  electrons flow per second
6. What is the emf of fully charged nickel iron cell?  
(A) 1.4 V (B) 1.5 V  
(C) 1.1 V (D) 2.1 V
7. What is the electrochemical equivalent of Nickel?  
(A) 0.3293 mg/c (B) 0.3387 mg/c  
(C) 0.304 mg/c (D) 0.3294 mg/c
8. Which is the name called for the ratio of effective value to average value of half cycle?  
(A) peak factor (B) form factor  
(C) effective factor (D) average factor

**A**

9. Which material is used to make the spring in a spring controlled indicating instrument?  
(A) beryllium-phosphor spiral hair spring  
(B) phosphor-copper spiral hair spring  
(C) beryllium-browns spiral hair spring  
(D) beryllium-copper spiral hair spring
10. How much time is required by 125 Hz AC supply to complete one cycle?  
(A) 0.008 (B) 0.08  
(C) 0.8 (D) 0.0008
11. At what temperature does 60:40 solder start to melt?  
(A) 382°C (B) 183°C  
(C) 103°C (D) 300°C
12. What is the value of a resistor with the color band sequence yellow, violet, green and gold?  
(A)  $4\text{ K}\Omega \pm 10\%$  (B)  $4.7\text{ K}\Omega \pm 5\%$   
(C)  $4700\text{ K}\Omega \pm 5\%$  (D)  $4.7\text{ M}\Omega \pm 10\%$
13. A 12V battery of negligible internal resistance is connected across a parallel combination of 4 K $\Omega$ , 6 K $\Omega$  and 12 K $\Omega$  resistors. What is the power developed by the 4 K $\Omega$  resistor?  
(A) 36 mW (B) 72 mW  
(C) 24 mW (D) 12 mW
14. The mutual inductance (m) of a coil is 3H. The self-inductances of the coils are 4H and 9H respectively. What is the coefficient of coupling between the coils?  
(A) 0.3 (B) 0.4  
(C) 0.5 (D) 0.6
15. What is the value of capacitance of a capacitor with a voltage of 3V and a charge of 15C?  
(A) 4F (B) 5F  
(C) 8F (D) 1F
16. What is the band gap energy of silicon?  
(A) 0 V (B) 0.7 eV  
(C) 1.12 eV (D) 5 eV
17. A depletion layer in a semiconductor consists of \_\_\_\_\_  
(A) Electrons (B) Protons  
(C) Immobile ions (D) Mobile ions

18. In a center-tapped full-wave rectifier, if  $V_m$  is the peak voltage between the centre tap and one end of the secondary, what is the maximum reverse voltage across the reverse biased diode?
- (A)  $\frac{1}{2} V_m$  (B)  $\frac{1}{4} V_m$   
(C)  $V_m$  (D)  $2 V_m$
19. What is the voltage regulation of an ideal voltage regulator?
- (A) 0 (B) 5  
(C) 10 (D) 50
20. Which of the following is an example of a negative adjustable voltage regulator?
- (A) IC 7805 (B) IC 7706  
(C) IC 7906 (D) LM 337
21. The current amplification factor ( $\alpha_{dc}$ ) for a common base configuration is defined as
- (A)  $I_B/I_C$  (B)  $I_C/I_B$   
(C)  $I_C/I_E$  (D)  $I_B/I_E$
22. The maximum peak-to-peak output voltage swing is achieved when the Q point of a transistor amplifier is located
- (A) at the centre of the load line (B) near cutoff point  
(C) near saturation point (D) at least on the load line
23. Crossover distortion typically occurs in which of the following amplifier types?
- (A) Class C amplifier (B) Class AB amplifier  
(C) Class A amplifier (D) Class B push-pull amplifier
24. In a common emitter amplifier, the input and output signals are
- (A) always negative (B) out of phase  
(C) always equal (D) in phase
25. Why is an emitter follower circuit widely used in electronic instruments?
- (A) Its output impedance is high and input impedance is low  
(B) Its voltage gain is less than unity  
(C) Its voltage gain is very high  
(D) Its output impedance is low and input impedance is high
26. If two stages of a cascaded amplifier have decibel gains of 30 and 60, then the overall gain is
- (A) 1800 (B) 90  
(C) 180 (D) 2

**A**

27. In a JFET, the drain current is maximum when  $V_{GS}$  is  
(A) zero (B) negative  
(C) positive (D) equal
28. A UJT has  $R_{BB} = 10K\Omega$  and  $R_{B2} = 4 K\Omega$ . Its intrinsic stand-off ratio is  
(A) 2.5 (B) 0.6  
(C) 5/3 (D) 0.4
29. How many alternating layers are present in an IGBT?  
(A) 2 layers (B) 3 layers  
(C) 4 layers (D) single layer
30. Which type of transistor is the BPX81?  
(A) Unijunction transistor (B) NPN Phototransistor  
(C) PNP Phototransistor (D) AF transistor
31. Full form of SCSI  
(A) Single Computer System Interface (B) Small Computer System Internet  
(C) Small Computer System Interface (D) Simple Computer System Internet
32. How do you optimize the hard disk?  
(A) Scan disk and defragmenter utilities (B) Disk repair  
(C) Disk format (D) Disk partition
33. Which of the following is a commonly used electronic simulation software?  
(A) AutoCAD (B) Solidworks  
(C) TNA-IT (D) TINA-TI
34. What is the email option to send a copy of the email being sent without others knowing?  
(A) Blinded Carbon Copy (B) Blind Carbon Copy  
(C) Blind Carbonic Copy (D) Blind Carbon Coping
35. Which property allows multiple line in one cell in Excel?  
(A) Drop caps (B) Wrap text  
(C) Merge cells (D) Thesaure
36. What is ISP?  
(A) Internet Service Provider (B) Internet Service Protocol  
(C) Intranet Service Provider (D) Internet Server Provider

37. In which category does a laser printer belong?  
(A) impact (B) non-impact  
(C) volatile (D) non-volatile
38. In Microsoft word, ctrl+j is used for  
(A) select the text (B) move the text  
(C) justify the text (D) delete the text
39. Which key is used with the line tool to draw a straight line in MS paint?  
(A) Alt (B) Enter  
(C) Ctrl (D) Shift
40. From which location is the first instruction available on boot-up?  
(A) ROM BIOS (B) POST  
(C) RAM (D) CONFIG
41. How many 2-input OR gates are required to implement a 4-bit greater than comparator circuit?  
(A) 1 (B) 2  
(C) 3 (D) 4
42. Decimal equivalent of octal 115 is  
(A) 77 (B) 1001101  
(C) 115 (D) 163
43. Which of the following statement(s) is/are correct?  
(i) CMOS logic gates have high fan-out so it drives large numbers of gates  
(ii) CMOS logic circuits have highest fan-in so it is able to handle more input gates  
(iii) Integrated Injection Logic (IIL) has the least propagation delay  
(iv) ECL has a very low noise margin  
(A) only (i), (ii) and (iii) (B) only (ii), (iii) and (iv)  
(C) only (i), (iii) and (iv) (D) only (i), (ii) and (iv)
44. \_\_\_\_\_ is used in digital circuits for simplifying arithmetic operations, enhancing error detection and reducing complexity  
(A) Binary Coded Decimal (B) Excess-3 code  
(C) 9's complement (D) 10's complement
45. How many bits are needed to store one Excess-3 code?  
(A) 3 bits (B) 4 bits  
(C) 8 bits (D) depends on the value

**A**

46. How many NAND gates are required to construct a 4:1 MUX by using 4-input NAND gate?  
(A) 6 (B) 7  
(C) 9 (D) 12
47. Which of the following statement(s) is/are correct about the decoder IC 7447?  
(i) When the RBI pin is low and the BCD input is 0000, the display remains unlit  
(ii) When cascading decoders in multi-digit display, RBI is always connected to ground  
(iii) RBO of one decoder is often connected to the RBI of the next decoder in the chain  
(A) only (i) (B) only (ii)  
(C) only (iii) (D) only (i) and (iii)
48. Which of the following statement(s) is/are correct about an ideal OP-AMP?  
(i) Zero input impedance and infinite bandwidth  
(ii) Infinite input impedance and infinite bandwidth  
(iii) Infinite output impedance and infinite slew rate  
(iv) Zero output impedance and zero common-mode gain  
(A) only (i) and (iii) (B) only (ii) and (iii)  
(C) only (i) and (iv) (D) only (ii) and (iv)
49. How many OP-AMPs are required to construct an instrumentation amplifier?  
(A) 1 (B) 2  
(C) 3 (D) 4
50. In the bistable mode, IC 555 acts as  
(A) Toggle Flip Flop (B) Delay Latch  
(C) Set Reset Latch (D) JK Flip Flop
51. Which of the following devices provides better waveform visualization and does not require anti-aliasing circuits?  
(A) Digital Storage Oscilloscope (DSO) (B) Cathode Ray Oscilloscope (CRO)  
(C) Digital Signal Analyzer (DSA) (D) Mixed Signal Oscilloscope (MSO)
52. Which of the following internal components generate waveforms in IC 8038?  
(A) Analog comparators and resistors (B) Digital Circuits  
(C) Operational amplifiers (D) Capacitors
53. How many pins are there in an HDMI cable?  
(A) 19 (B) 18  
(C) 24 (D) 32



54. Which of the following is a primary advantage of using BNC connectors in professional video equipment?
- (A) Secure data encryption (B) Compact size and ease of use  
(C) High frequency signal stability (D) Low cost
55. What is the total number of pins in a typical SATA connector used for data?
- (A) 4 (B) 15  
(C) 7 (D) 8
56. Which of the following IC package types is the smallest in size?
- (A) CSP (Chip Scale Package) (B) BGA (Ball Grid Array)  
(C) FCP (Flip-Chip Package) (D) QFP (Quad Flat Package)
57. Which of the following IC package types provides the best thermal conduction?
- (A) Chip scale package (B) Ball grid array  
(C) Quad flat package (D) Dual in-line package
58. What is the primary cause of Electrostatic Discharge (ESD)?
- (A) High humidity  
(B) Presence of temperature  
(C) Accumulation of static charge on a surface  
(D) Electromagnetic interference
59. What is the purpose of using flux during the soldering process?
- (A) To clean the soldering iron tip  
(B) To prevent oxidation and improve solder flow  
(C) To increase the melting point of the solder  
(D) To cool down the solder joint
60. What is the primary purpose of reflow soldering?
- (A) To use a solder wave to create joints on through-hole components  
(B) To heat and melt solder paste for Surface-Mount Devices (SMDs)  
(C) To clean the PCB before soldering  
(D) To create a solder joint using a soldering iron
61. Which of the following fibers experiences the least attenuation for a given wavelength of light?
- (A) Single-mode fiber (B) Multi-mode fiber  
(C) Plastic optical fiber (D) Graded-index fiber

**A**

62. In ionospheric propagation, which of the following factors most significantly affects the critical frequency of the ionosphere?
- (A) Solar cycle variations
  - (B) Frequency of the radiowave
  - (C) Geographical location
  - (D) Atmospheric pressure
63. A super-heterodyne receiver with an intermediate frequency of 455 KHz is tuned to a frequency of 1200KHz. Calculate the image frequency.
- (A) 455 KHz
  - (B) 2011 KHz
  - (C) 2110 KHz
  - (D) 1655 KHz
64. Which of the following is the primary cause of a mismatch in an antenna's impedance and the transmission line?
- (A) The reflection coefficient
  - (B) The radiation resistance
  - (C) The angle of radiation
  - (D) The reactance of the antenna
65. In a system using QPSK (Quadrature Phase Shift Keying), how many bits can be transmitted per symbol?
- (A) 1 bit
  - (B) 2 bits
  - (C) 4 bits
  - (D) 8 bits
66. Which video output format is commonly used by DVRs for displaying video on monitors in a CCTV system?
- (A) VGA (Video Graphics Array)
  - (B) HDMI (High Definition Multimedia Interface)
  - (C) DVI (Digital Visual Interface)
  - (D) BNC (Bayonet Neill-Concelman)
67. Which of the following registers in the 8051 is used to store the carry bit during arithmetic operations?
- (A) PSW
  - (B) TCON
  - (C) SFR
  - (D) IE
68. In the 8051 microcontroller, which instruction will cause a change in the Program Counter (PC) when executed?
- (A) NOP
  - (B) JMP
  - (C) MOV A, #55h
  - (D) MOV R0, A

69. Which of the following instructions uses the Program Counter (PC) to address external memory for data transfer in the 8051 microcontroller?
- (A) MOVC (B) MOVX  
(C) MOV (D) ANL
70. What is the result when executing the instruction MOV A, @R0 in the 8051 microcontroller?
- (A) The content of the accumulator (A) is moved to R0  
(B) The content of R0 is moved to the accumulator (A)  
(C) The content of the memory location pointed by R0 is moved to the accumulator (A)  
(D) The instruction causes an invalid operation
71. Which of the following statements about thermocouples is true?
- (A) They follow a linear relationship between temperature and voltage.  
(B) The Seebeck voltage depends only on the type of metals used.  
(C) The output voltage is proportional to the temperature difference between the junctions.  
(D) Thermocouples cannot measure temperatures above 100°C.
72. The starting torque of a single-phase induction motor is typically
- (A) High, making it suitable for direct starting  
(B) Low, requiring auxiliary methods for starting  
(C) Zero, because the motor cannot start on its own  
(D) Constant at all speeds
73. Which of the following statements is true about an LVDT (Linear Variable Differential Transformer)?
- (A) It can measure angular displacement  
(B) It requires an AC excitation voltage  
(C) It operates based on capacitive principles  
(D) It has a non-linear output for small displacements
74. A strain gauge has a gauge factor of 2.0 and a nominal resistance of 120  $\Omega$ . If the strain applied to the gauge is  $500 \times 10^{-6}$ , calculate the change in the resistance of the strain gauge.
- (A) 0.12  $\Omega$  (B) 120  $\Omega$   
(C) 21  $\Omega$  (D) 1200  $\Omega$

**A**

75. In a capacitive transducer, if the distance between the plates is halved while the area remains constant, the capacitance will
- (A) Increase by four times
  - (B) Remain the same
  - (C) Halve
  - (D) Double
76. An inductive displacement transducer measures displacement by
- (A) Measuring changes in resistance of the coil
  - (B) Measuring changes in inductance due to core movement
  - (C) Generating eddy currents in a target material
  - (D) Varying dielectric constants between two plates
77. In a thermistor-based circuit, self-heating occurs when
- (A) Current flowing through the thermistor is negligible
  - (B) The thermistor generates heat due to high current flow
  - (C) The ambient temperature drops suddenly
  - (D) The thermistor operates in a vacuum
78. Which of the following mechanisms is primarily responsible for the tripping of an MCB during short-circuit conditions?
- (A) Thermal mechanism due to heating effect
  - (B) Voltage sensing element
  - (C) Mechanical mechanism due to overload
  - (D) Electromagnetic mechanism due to high current flow
79. The speed-torque characteristic of a single-phase induction motor is typically non-linear and shows a significant drop in torque as the speed increases. This characteristic is primarily due to which of the following factors?
- (A) A high starting torque and low breakdown torque
  - (B) The increasing effect of the motor's inductance as the speed increases
  - (C) The slip varying inversely with the load torque
  - (D) The reduced effective magnetic flux as the rotor accelerates, leading to lower torque
80. A star-delta starter is used for starting a three-phase induction motor primarily to reduce which of the following?
- (A) Motor speed during startup
  - (B) Motor slip during startup
  - (C) Starting current and torque
  - (D) Power factor during startup

81. The tolerable line frequency range for single phase equipment is  
(A) 49 Hz to 51 Hz (B) 48.5 Hz to 51.5 Hz  
(C) 48 Hz to 52 Hz (D) 49.5 Hz to 50.5 Hz
82. The working principle of Constant Voltage Transformer (CVT) is  
(A) Ferroresonance  
(B) Mutual inductance  
(C) Self-inductance  
(D) Electromagnetism
83. Which electrical device is used in UPS to immediately switch main power supply to its stored backup power?  
(A) Isolator (B) Reed relay  
(C) Electromagnetic relay (D) Static transfer switch
84. Line Interactive UPS are generally available with capacity between  
(A) 1 KVA and 2 KVA  
(B) 2 KVA and 10 KVA  
(C) 750 VA and 5 KVA  
(D) 1 KVA and 5 KVA
85. What is the switching frequency of SMPS?  
(A) 50Hz (B) 50Hz to 100Hz  
(C) 60Hz (D) 15KHz to 1MHz
86. The disadvantage of Twisted Nematic LCD display is  
(A) Low quality colour reproduction (B) Faster battery drainage  
(C) More power consumption (D) Wide viewing angle
87. Which of the following is used as backlights in LCD TV?  
(A) LEDs  
(B) Fluorescent light  
(C) Incandescent lamp  
(D) No backlights are required
88. DVI cable means  
(A) Digital Video Interface (B) Digital Video Interconnect  
(C) Digital Visual Interface (D) Digital Video Interaction

**A**

89. How many bits are used for coding to generate 64 functions in the IR remote control system?  
(A) 8 bits (B) 12 bits  
(C) 6 bits (D) 24 bits
90. Expansion of LNB  
(A) Low noise booster (B) Low noise block down converter  
(C) Line network booster (D) Low noise buck converter
91. What is the advantage of IPS screen technology?  
(A) Wide viewing angle (B) The refresh rate is slower  
(C) Faster battery drainage (D) More expensive
92. Which of the following is the ratio of luminance signal?  
(A)  $Y = 30\% \text{ Red} + 57\% \text{ Green} + 11\% \text{ Blue}$   
(B)  $Y = 30\% \text{ Green} + 59\% \text{ Red} + 11\% \text{ Blue}$   
(C)  $Y = 30\% \text{ Blue} + 59\% \text{ Green} + 11\% \text{ Red}$   
(D)  $Y = 30\% \text{ Red} + 59\% \text{ Green} + 11\% \text{ Blue}$
93. Inter carrier frequency used for TV signal transmission is  
(A) 5 MHz (B) 6 MHz  
(C) 5.5 MHz (D) 7 MHz
94. The name for DC to DC converter is \_\_\_\_\_  
(A) Chopper (B) Rectifier  
(C) Inverter (D) UPS
95. Which of the following is a buck converter IC?  
(A) MC 34063 (B) LM 2625  
(C) LM 317 (D) LM 2576
96. Which material is used to make heating element in cooking range?  
(A) Aluminium (B) Nichrome  
(C) Copper (D) Tungsten
97. Which type of AC single-phase motor is used in washing machine??  
(A) Universal motor  
(B) Capacitor start squirrel cage induction motor  
(C) Repulsion motor  
(D) Shaded pole motor

98. Which of the following is an impact printer?  
(A) Dot matrix printer (B) Inkjet printer  
(C) Laser printer (D) Thermal printer
99. The technology used in non-impact printers is  
(A) Inkjet technology  
(B) Laser technology  
(C) Electromechanical mechanism  
(D) Both (A) and (B)
100. Which type of AC single-phase motor is used in food mixer?  
(A) Repulsion motor (B) Split phase motor  
(C) Universal motor (D) Shaded pole motor
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**A**

SPACE FOR ROUGH WORK