

058/23

Question Booklet Alpha Code

A

A

Question Booklet Sl. No.

Total Number of Questions : 100

Time : 90 Minutes

Maximum Marks : 100

INSTRUCTIONS TO CANDIDATES

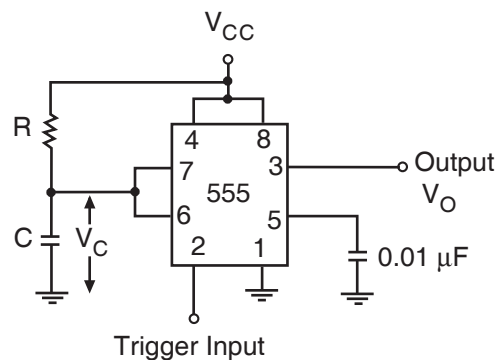
1. The Question Paper will be given in the form of a Question Booklet. There will be four versions of Question Booklets with Question Booklet Alpha Code viz. **A, B, C & D**.
2. The Question Booklet Alpha Code will be printed on the top left margin of the facing sheet of the Question Booklet.
3. The 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 un-numbered, 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.

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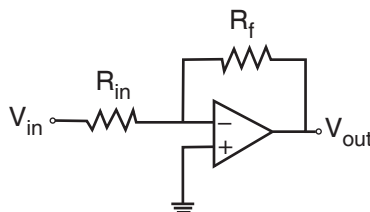
A

1. An Ideal operational amplifier does not have
 - A) Infinite voltage gain
 - B) Infinite input impedance
 - C) Infinite output impedance
 - D) Infinite bandwidth
2. The instruction `MOVC A,@A+DPTR` denotes an 8051 instruction in
 - A) Register addressing mode
 - B) Direct addressing mode
 - C) Register indirect addressing mode
 - D) Indexed addressing mode
3. The common collector current gain (γ) of a Bipolar Junction Transistor is 10. The value of its common base current gain (α) will be
 - A) 9
 - B) 10
 - C) 0.9
 - D) None of the above
4. Which of the following is not related to the specifications of a Capacitor ?
 - A) Value
 - B) Power rating
 - C) Tolerance
 - D) Temperature coefficient
5. The figure below shows the circuit diagram of a



- A) Astable multivibrator
 - B) Monostable multivibrator
 - C) Bistable multivibrator
 - D) Voltage controlled oscillator
6. In a series resonant circuit, at resonant frequency the current and voltage are
 - A) 180° out of phase
 - B) 90° out of phase
 - C) 45° out of phase
 - D) In Phase

7. A Resistor with the 4 band colour code of Brown, Black, Black, Red. Its range of value is
 A) $9.8 - 10.2 \Omega$ B) $8 - 12 \Omega$
 C) $98 - 102 \Omega$ D) $10 - 12 \Omega$
8. The number of D flipflops required to implement a mod 6 Johnson counter is
 A) 6 B) 3
 C) 12 D) None of the above
9. Which of the following is a polarized capacitor ?
 A) Mica B) Ceramic
 C) Electrolytic D) Paper
10. The upper cutoff frequency of an RC coupled amplifier is mainly due to
 A) Emitter bypass capacitor
 B) Coupling capacitor at the input side
 C) Coupling capacitor at load side
 D) Inter electrode capacitance
11. A common emitter transistor amplifier without emitter bypass capacitor has the following parameters: $R_L = 100 \text{ K}\Omega$, $R_E = 10 \text{ K}\Omega$, $h_{FE} = 100$. Its voltage gain is
 A) 10000 B) 1000
 C) 100 D) 10
12. One of the applications of a Transformer is for
 A) Impedance matching B) Frequency shifting
 C) Power amplification D) Energy storage
13. An amplifier using operational amplifier is shown below. The value of V_{out}/V_{in} is



where $R_f = 10 \text{ K}\Omega$ and $R_{in} = 1 \text{ K}\Omega$

- A) 10 B) 11
 C) -10 D) None of the above

14. The SFR address of B register in 8051 is

A) 080H	B) 0F0H
C) 0E0H	D) 0D0H
15. The IC 7476 is

A) Decoder	B) Shift register
C) JK flipflop	D) D flipflop
16. The transistor configuration which has both voltage and current gain is

A) Common Emitter	B) Common Base
C) Common Collector	D) All the above
17. In the instruction MOV A, @Ri. the register Ri may be

A) Any register from R0 to R7	B) Registers R0 and R1 only
C) Register R0 only	D) None of the above
18. A Bipolar Junction Transistor (BJT) is a

A) Voltage Controlled Voltage Source (VCVS)
B) Voltage Controlled Current Source (VCCS)
C) Current Controlled Voltage Source (CCVS)
D) Current Controlled Current Source (CCCS)
19. Which of the following IC is a general purpose opto coupler ?

A) NE 566	B) 4N35
C) NE565	D) NE 555
20. In a series resonant circuit, at resonant frequency the current through the capacitor is _____ the current through the inductor.

A) greater than	B) less than
C) greater than or equal to	D) equal to
21. A component which opposes sudden change in voltage is

A) Capacitor	B) Inductor
C) Diode	D) Resistor
22. The SMPS work on the principle of

A) Integral control	B) Chopper
C) Phase control	D) Frequency control

23. The IE register of 8051 is
- A) Non bit addressable register
 - B) Bit addressable register
 - C) 16 bit register
 - D) Used to set the priorities of interrupt
24. The maximum input voltage and output voltage of IC regulator 7812 is
- A) 35V, 6V
 - B) 30V, – 6V
 - C) – 35V, – 12V
 - D) 35V, 12V
25. Which of the following is an active component ?
- A) Resistor
 - B) Transistor
 - C) Inductor
 - D) Capacitor
26. The Gray code corresponding to the binary number 1111 is
- A) 1010
 - B) 1111
 - C) 1000
 - D) 1100
27. The tolerance of a Resistor with three band colour code is
- A) $\pm 10\%$
 - B) $\pm 5\%$
 - C) $\pm 20\%$
 - D) $\pm 2\%$
28. In a series resonant circuit with quality factor of 10 has a 3dB bandwidth of 100 KHz. Its resonant frequency in KHz is
- A) 1000
 - B) 10
 - C) 100
 - D) 50
29. Master slave configuration is used in flipflops to
- A) Reduce propagation delay
 - B) Reduce power dissipation
 - C) Eliminate race around condition
 - D) None of the above
30. Which of the following statements is correct for interrupt priorities in 8051 ?
- A) A high-priority interrupt can interrupt a low-priority interrupt
 - B) All interrupt are latched internally
 - C) Low-priority interrupt wait until 8051 has finished servicing the high-priority interrupt
 - D) All the above

31. The CMRR of an operational amplifier should be
 A) As small as possible B) Close to zero
 C) As large as possible D) Close to unity
32. A material with resistivity of $\rho \Omega\text{-m}$ has a length of 1 meter and area of cross section of 1m^2 . Its Resistance is
 A) $\rho\Omega$ B) $R = 1 \Omega$
 C) $R = 1/\rho\Omega$ D) $2 \rho\Omega$
33. If the length and radius of a resistive material are doubled
 A) The resistance is doubled and the resistivity is halved
 B) The resistance is halved and the resistivity is doubled
 C) The resistance is halved and the resistivity remains the same
 D) The resistance is doubled and the resistivity remains the same
34. How many select lines are contained in a multiplexer with 2048 inputs and one output ?
 A) 2048 B) 1024
 C) 11 D) 10
35. A Transformer cannot raise or lower the DC voltage because
 A) Faraday's Laws of Electromagnetic induction is not valid since the rate of change of flux is zero
 B) There is no self inductance
 C) DC circuit has more losses
 D) None of the above
36. Data can be changed from temporal code to spacial code by using
 A) Serial-in, serial-out, shift register
 B) Serial-in, parallel-out, shift register
 C) Parallel-in, parallel-out, shift register
 D) Parallel-in, serial-out, shift register
37. In an AVR, to set all the bits in a register R2 to 1, we must OR the register R2 with
 A) 00H B) 11H
 C) FFH D) 0FH
38. In a PLL, when the input is applied and the Voltage Controlled Oscillator (VCO) starts to change the frequency it is said to be in
 A) Free running mode B) Capture mode
 C) Phase locked state D) None of the above

39. Which of the following is not an assembler directive in an AVR ?
 A) ORG
 B) EQU
 C) INCLUDE
 D) DDR
40. The minimum number of two- input NAND gates required to realize a half subtractor is
 A) 6
 B) 5
 C) 4
 D) 3
41. The program

```
LDI R16, $FF
OUT DDRB, R16
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will
 A) Configure PORT B as output port
 B) Configure PORT B as input port
 C) Read 7 bit data and store in R16 register
 D) None of the above
42. A 2-bit parallel counter and a 3-bit Johnson counter are cascaded. The modulus of the cascaded configuration is
 A) 16
 B) 6
 C) 12
 D) 24
43. The speed control of DC motor through the interfacing with 8051 can be accomplished with
 A) PPM
 B) PWM
 C) PAM
 D) All the above
44. The PLL can be used for
 A) Frequency multiplication
 B) Frequency division
 C) FM demodulation
 D) All the above
45. Which one of the following have large code size and less execution time ?
 A) Subroutine
 B) Macro
 C) Subroutine and macro
 D) None of the above
46. The phase difference between the input and output voltages of a common base transistor amplifier is
 A) 270°
 B) 180°
 C) 90°
 D) 0°

47. The CMRR of 741OP-AMP is approximately equal to
A) 90 dB
B) 10 dB
C) 100 dB
D) 50 dB
48. Two amplifiers with voltage gains of 20 dB and 30 dB are cascaded. The overall voltage gain of the cascaded configuration will be
A) 600 dB
B) 10 dB
C) 50 dB
D) None of the above
49. How many inputs and outputs does a full adder circuit have ?
A) Two inputs, two outputs
B) Three inputs, two outputs
C) Three inputs, one output
D) Two inputs, one output
50. In a sequential circuit, output at any instant of time depends
A) Only on the inputs present at that instant of time
B) Only on the past outputs
C) Only on the past inputs
D) On past outputs as well as present inputs
51. A crystal oscillator has
A) High output voltage
B) High efficiency
C) Substantially constant frequency of oscillations
D) Very low dc supply voltage
52. Which of the following uses a split tank capacitor ?
A) Hartley Oscillator
B) Colpitts Oscillator
C) RC Phase Shift Oscillator
D) Wien Bridge Oscillator
53. No. of RC network required to be cascaded in RC phase shift oscillator
A) One
B) Two
C) Three
D) Four
54. The piezoelectric effect in a crystal is
A) voltage developed because of mechanical stress
B) change in resistance because of temperature
C) change in frequency because of temperature
D) none of the above

55. For good differentiator
- A) The time constant RC of the circuit should be much smaller than the time period of the input wave
 - B) The value of X_C should be 10 or more times larger than R at the operating frequency
 - C) Both A) and B)
 - D) None of these
56. If a signal passes through an integrator, the amplitude of noise signal
- A) Enhanced
 - B) Stabilized
 - C) Reduced
 - D) None of these
57. A Hartley oscillator is commonly used in
- A) Radio receivers
 - B) Radio transmitters
 - C) TV receivers
 - D) None of the above
58. Which of the following is a condition for oscillation ?
- A) A phase shift around the feedback loop of 180 degree
 - B) A gain around the feedback loop of one-third
 - C) A phase shift around the feedback loop of zero degree
 - D) A gain around the feedback loop of less than 1
59. _____ is a square wave generator.
- A) Monostable multivibrator
 - B) Astable multivibrator
 - C) Bistable multivibrator
 - D) None of the above
60. Most suitable circuit to generate 1 KHz signal is
- A) Hartley Oscillator
 - B) Colpitts Oscillator
 - C) RC Phase Shift Oscillator
 - D) Wien Bridge Oscillator
61. Indicate the false statement. Modulation is used to
- A) reduce the bandwidth used
 - B) separate differing transmissions
 - C) ensure that intelligence may be transmitted over long distance
 - D) allow the use of practical antennas

62. The modulation index of an AM wave is changed from 0 to 1. The transmitted power is
- A) Unchanged
 - B) Halved
 - C) Doubled
 - D) Increased by 50 percent
63. Vestigial Sideband Modulation is used for
- A) HF point to point communication
 - B) TV broadcasting
 - C) Stereo broadcasting
 - D) None of these
64. In an AM wave useful power is carried by
- A) Carrier
 - B) Sidebands
 - C) Both sidebands and carrier
 - D) None of the above
65. Overmodulation occurs in AM, when signal amplitude is _____ carrier amplitude.
- A) Equal to
 - B) Greater than
 - C) Less than
 - D) None of the above
66. The amount of frequency deviation in FM signal depends on
- A) Amplitude of the modulating signal
 - B) Carrier frequency
 - C) Modulating frequency
 - D) Transmitter amplifier
67. The modulation index of FM is given by
- A) frequency deviation / modulating frequency
 - B) modulating frequency / frequency deviation
 - C) modulating frequency / carrier frequency
 - D) carrier frequency / modulating frequency
68. Which modulator is used for generating DSB-SC signal ?
- A) Square law modulator
 - B) Balanced modulator
 - C) Envelope detector
 - D) Armstrong modulator
69. Which of the following modulation technique is having lowest bandwidth ?
- A) AM
 - B) FM
 - C) DSB SC
 - D) SSB SC
70. Which of the following is not an advantage of FM over AM ?
- A) Better noise immunity is provided
 - B) Lower bandwidth is required
 - C) The transmitted power is more useful
 - D) Less modulating power is used

71. Which one of the following blocks is not common in both AM and FM receivers ?

- A) RF amplifier
- B) Mixer
- C) Slope detector
- D) IF amplifier

72. Which one of the following statement is correct ?

Noise has the greatest effect in a communication system when it interferes with the signal

- A) In the transmitter
- B) In the channel
- C) In the receiver
- D) In the transducer

73. An AM superheterodyne receiver with IF of 455 kHz is tuned to the carrier frequency of 1000 kHz. The image frequency is

- A) 545 kHz
- B) 2000 kHz
- C) 1455 kHz
- D) 1910 kHz

74. Which of the following are the advantages of FM broadcasting over AM broadcasting ?

- 1. Better S/N ratio.
- 2. Not subject to signal fading.
- 3. Power efficiency is superior.
- 4. Demodulation is simpler.

Select the correct answer from the code given below :

- A) 1 and 2
- B) 1, 2 and 4
- C) 2, 3 and 4
- D) 1 and 3

75. High level modulation refers to the modulation process in which

- A) Modulation is done at high power of carrier and modulating signal
- B) Collector modulation method is high level modulation
- C) Power amplifiers are used to boost the carrier and modulating signals before modulation
- D) All of the above

76. FM receivers using the standard 88 to 108 MHz band use IF of

- A) 8 MHz
- B) 9.9 MHz
- C) 10.7 MHz
- D) 12.2 MHz

77. _____ of a receiver is its ability to reproduce the exact replica of the transmitted signals at the receiver output.
- A) Sensitivity
B) Fidelity
C) Selectivity
D) Noise figure
78. Pre-emphasis in FM system involves
- A) Compression of the modulating signal
B) Expansion of the modulating signal
C) Amplification of lower frequency components of the modulating signal
D) Amplification of higher frequency components of the modulating signal
79. Which oscillator is used as a local oscillator in radio receiver ?
- A) Phase shift
B) Wien bridge
C) Hartley
D) Crystal
80. The image frequency rejection becomes poor when the intermediate frequency is
- A) Low
B) Very high
C) Moderate
D) High
81. The smallest change in a measured variable to which an instrument will respond is
- A) Accuracy
B) Resolution
C) Precision
D) Sensitivity
82. A moving coil galvanometer is made into a dc ammeter by connecting
- A) a low resistance across the meter
B) a high resistance in series with the meter
C) a pure inductance across the meter
D) a capacitor in series with the meter
83. A multimeter is used for the measurement of the following.
1. Both ac and dc voltage.
 2. Both ac and dc current.
 3. Resistance.
 4. Frequency.
 5. Power.
- A) 1, 2 and 4
B) 1, 2 and 5
C) 1, 3 and 5
D) 1, 2 and 3

84. The input impedance of a CRO is nearly
 A) 1 M Ω B) 10 Ω
 C) 100 Ω D) Zero
85. In a CRT the highest positive potential is given to
 A) focusing electrodes B) cathode
 C) vertical deflection plates D) post deflection acceleration anode
86. Dual trace CRO uses
 A) one beam B) two beams
 C) three beams D) four beams
87. In a digital oscilloscope, the A/D converters are usually
 A) ramp type B) integrating type
 C) flash type D) successive approximate type
88. Which amplifier is used in an electronic multimeter ?
 A) Power amplifier B) Buffer amplifier
 C) Differential amplifier D) Wideband amplifier
89. In a 3½ digit 0 – 10V DVM, the most significant digit is
 A) ½ B) 0 or 1
 C) 0 or 10 D) 3
90. A moving iron instrument can be used for
 A) DC only B) AC only
 C) Both DC and AC D) None of the above
91. A message signal made of multiple frequency components has a maximum frequency value of 10 kHz. What should be the minimum sampling frequency to sense the information present in this signal ?
 A) 10 kHz B) 5 kHz
 C) 15 kHz D) 20 kHz
92. Which of the following pulse modulation system is analog ?
 A) PAM B) DM
 C) DPCM D) PCM

93. The bandwidth requirement is high in
A) PAM
B) PPM
C) PWM
D) Both B) and C)
94. Companding is the process of
A) Compression
B) Compression and Expansion
C) Expansion
D) None of the above
95. Name the modulation technique which requires synchronization between transmitter and receiver.
A) PAM
B) PWM
C) PPM
D) PCM
96. The binary waveform used to generate BPSK signal is encoded in
A) Bipolar NRZ format
B) Manchester coding
C) Differential coding
D) None of the above
97. QPSK system uses a phase shift of
A) π
B) $\pi/2$
C) $\pi/4$
D) 2π
98. The technique used to reduce the sideband power is
A) MSK
B) BPSK
C) Gaussian minimum shift keying
D) BFSK
99. In BFSK, mark and space respectively represent
A) 1 and 0
B) 0 and 1
C) 00 and 11
D) 11 and 00
100. In PCM, Noise is measured in
A) Mel
B) Decibel
C) Phon
D) Zone
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Space for Rough Work

