108/2025

Question Booklet Alpha Code **A**

Question Booklet Serial Number

Total No. of questions : 100 Time : 1 Hour 30 Minutes

Maximum : 100 Marks

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 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.

108/2025

Maximum : 100 marks

Time : 1 hour and 30 minutes

1. Which of the following semiconductor material is used in the manufacture of white light emitting LEDs?

(A) Silicon
(B) Germanium
(C) Gallium Arsanide
(D) Indium Gallium Nitride

2. Which of the following devices is an active device?

(A) Field effect transistor
(B) Carbon composition resistor
(C) Electrolytic capacitor
(D) Ceramic capacitor

3. Rectification efficiency of a centre tap rectifier is:

(A) 50%
(B) 40.6%
(C) 81.2%
(D) 25%

4. Band gap energy of Silicon at 300 K temperature is :

(A) 0.7 V
(B) 1.12 V
(C) 1.12 eV
(D) 0.7 eV

5. An inverter :

(A) Converts AC to high voltage AC
(B) Converts DC to AC
(C) Converts AC to DC
(D) Increases voltage of DC

6. Which of the following semiconductor material is most widely used in the manufacture of VLSI circuits?

(A) Germanium
(B) Ga As
(C) Silicon
(D) Si C

7. Which of the following Batteries have the highest gravimetric energy density?

(A) Lead Acid Battery
(B) Lithium Ion Battery
(C) Ni – Cd Battery
(D) Zinc – Carbon Battery

8. A charged lead acid cell functions as a :

(A) Dependent voltage source
(B) Independent voltage source
(C) Dependent current source
(D) Independent current source

9. 8051 microcontroller has a _____ wide address bus.

(A) 16 bit
(B) 8 bit
(C) 4 bit
(D) 32 bit

10. 8051 microcontroller has _____ of read only memory.

(A) 4 MB
(B) 64 KB
(C) 4 GB
(D) 4 KB

11. GSM mobile technology uses :

(A) FDMA only
(B) TDMA only
(C) Both TDMA and FDMA
(D) CDMA and FDMA

12. Which of the following frequency band is used for commercial mobile cellular communication?

(A) HF band
(B) UHF band
(C) Ka band
(D) VLF band

13. In a voltage regulator circuit using a Zener diode with a 9V breakdown voltage, a 300 Ω series resistor, and a 15V input voltage, what is the current flowing through the Zener diode when the load resistance is 900 Ω?

(A) 15 *mA*
(B) 20 *mA*
(C) 10 *mA*
(D) 25 *mA*

14. Why is a cascode amplifier (BJT-FET combination) preferred over a two-BJT amplifier in high-frequency applications?

(A) Lower input capacitance
(B) Higher output resistance
(C) Reduced Miller effect
(D) Increased harmonic distortion

15. In a multistage amplifier, what is the main advantage of using staggered tuning over identical tuning?

(A) Higher gain
(B) Wider bandwidth
(C) Lower noise
(D) Improved input impedance

16. In a transistor amplifier, which configuration provides the highest input impedance?

(A) Common Emitter
(B) Common Base
(C) Common Collector
(D) Darlington Pair

17. What is the primary advantage of a Class AB power amplifier over a Class B amplifier?

(A) Higher output power
(B) Reduced crossover distortion
(C) Improved input impedance
(D) Greater thermal stability

18. Why is a crystal oscillator preferred in precision applications compared to LC oscillators?

(A) Higher gain
(B) Better frequency stability
(C) Lower power consumption
(D) Simpler design

19. An NPN BJT with a current gain (β) of 100 is used as a switch. In which two regions does it primarily operate, and what is a condition that could cause it to enter the active region, increasing power dissipation?

(A) Active and saturation; excessive collector current.
(B) Saturation and linear; high base-emitter voltage.
(C) Cutoff and saturation; insufficient base current $\left(I_B < \frac{I_C}{\beta}\right)$
(D) Cutoff and active; insufficient collector-emitter voltage.

20. For a Class A amplifier, the quiescent collector current is $I_{CQ} = 120$ mA and the supply voltage is $V_{CC} = 10$ V. What is the maximum AC power output, assuming it is resistively loaded with the Q-point centered?

(A) 1.2 W
(B) 0.6 W
(C) 0.3 W
(D) 2.4 W

21. A multistage amplifier consists of three identical stages, each with a gain of 10. What is the total gain in dB?

(A) 30 dB
(B) 60 dB
(C) 1000 dB
(D) 20 dB

22. A Darlington pair is formed with two transistors Q1 and Q2 with current gains 60 and 80 respectively. If the base current of Q1 is 10 μA, what is the emitter current of Q2?

(A) 48.61 mA (B) 49.41 mA

(C) 50.00 mA (D) 47.50 mA

23. A common – source FET amplifier with an n-channel MOSFET has $g_m = 4$ mS, $R_D = 3$ kΩ and $R_S = 0.5\,k\Omega$, with no bypass capacitor. Calculate the low-frequency voltage gain (A_v)

(A) –6 (B) –4

(C) –8 (D) –2

24. A Colpitts oscillator uses two capacitors of 2000 pF each and an inductor of 2 mH. What is the oscillation frequency?

(A) 120 MHz (B) 120 Hz

(C) 120 kHz (D) 150 kHz

25. An RC phase shift oscillator with three identical RC stages uses an inverting amplifier with a gain of –30. Each stage has R = 10 kΩ and C = 10 nF. What is the total phase shift provided by the three RC stages at the oscillation frequency?

(A) 180° (B) 90°

(C) 360° (D) 270°

26. In a full-wave rectifier circuit with a capacitor filter, the input is a 50 Hz sine wave. If the load resistance is 1 kΩ and the filter capacitor is 100 μF, what is the approximate ripple factor? (Given $\frac{1}{\sqrt{3}} \approx 0.577$) :

(A) 0.024 (B) 0.012

(C) 1.21 (D) 0.483

27. What is the primary advantage of using a tunnel diode in high-frequency circuits compared to a standard PN junction diode?

(A) Higher reverse breakdown voltage (B) Negative resistance region

(C) Lower forward voltage drop (D) Improved thermal stability

28. Why is a Class D amplifier preferred in modern portable devices over a Class A amplifier?

(A) Higher linearity
(B) Greater efficiency
(C) Lower input impedance
(D) Reduced harmonic distortion

29. What is the main advantage of a Wien bridge oscillator over an RC phase shift oscillator?

(A) Higher frequency stability
(B) Simpler feedback network
(C) Lower power requirement
(D) Greater amplitude control

30. Which characteristic of a bistable multivibrator makes it suitable for memory applications?

(A) Continuous oscillation
(B) Single stable state
(C) Two stable states
(D) Automatic triggering

31. A three-stage BJT amplifier must handle signals from 0Hz to 100 kHz. Which of the following coupling method is suitable for this amplifier?

(A) RC coupling
(B) Transformer coupling
(C) Direct coupling
(D) Tuned coupling

32. Why is a MOSFET preferred over a JFET in digital switching applications?

(A) Higher transconductance
(B) No gate current requirement
(C) Lower input capacitance
(D) Greater thermal stability

33. Which of the following is not an ideal characteristics of an opamp?

(A) Infinite CMRR
(B) Infinite input resistance
(C) Zero output resistance
(D) Zero slew rate

34. Virtual ground concept occurs in :

(A) Inverting amplifier
(B) Non-inverting amplifier
(C) Differential amplifier
(D) All of the above

35. Type of negative feedback used in an inverting amplifier is :

(A) Voltage series
(B) Voltage shunt
(C) Current series
(D) Current shunt

36. 741 opamp has a slew rate of 0.5 V/us. What is the maximum frequency an input sinusoid of peak value 5V at which distortion sets in due to slew rate limitation?

(A) 7.96 KHz (B) 31.84 KHz

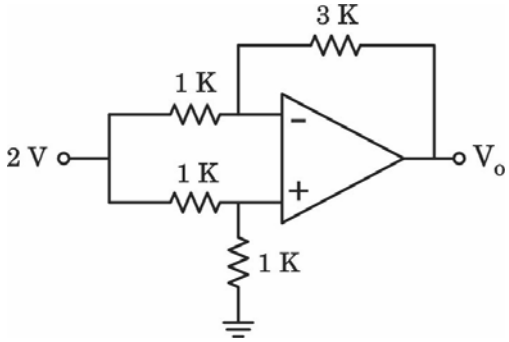
(C) 15.92 KHz (D) 47.76 KHz

37. Unity Gain-bandwidth of 741 opamp is 1MHz. A non-inverting amplifier which uses 741 opamp having a voltage gain of 40 dB will exhibit a –3dB bandwidth of :

(A) 1 MHz (B) 100 kHz

(C) 10 kHz (D) 1 kHz

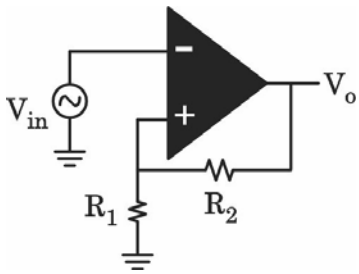
38. For the opamp circuit shown in figure below, V_o is:



(A) – 2 V (B) –1 V

(C) – 0.5 V (D) 0.5 V

39. Consider the Schmitt trigger shown in the figure. The resistance values are $R_1 = R_2 = 5K\Omega$ with saturation voltage of ± 10 V. The hysteresis voltage will be :



(A) 0 V (B) 5 V

(C) 10 V (D) 15 V

40. A comparator with zero reference voltage is called as :

(A) Zero crossing detector (B) Schmitt trigger

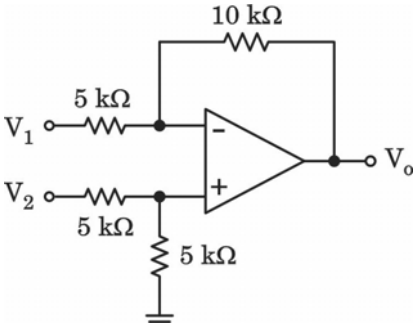
(C) Non-inverting amplifier (D) Inverting amplifier

41. The output amplitude of an opamp astable multivibrator can be limited by the use of :

(A) capacitors (B) resistors

(C) zener diodes (D) LEDs

42. The output voltage V_o of the differential amplifier with inputs $V_1 = 2V$ and $V_2 = 4V$ is :



(A) 8 V (B) – 4 V

(C) 2 V (D) – 2 V

43. Which of the following is a requirement for an instrumentation amplifier?

(A) Low input impedance and low slew rate

(B) High power consumption and low gain stability

(C) High output impedance and low slew rate

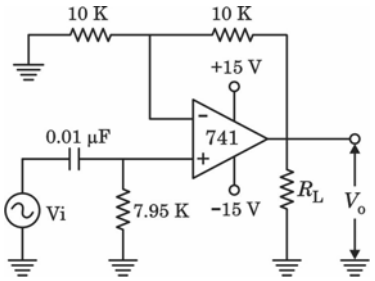
(D) High gain stability and high CMRR

44. The pass band gain of a second order butterworth filter is :

(A) 1.414 (B) 1.73

(C) 0.766 (D) 1.586

45. The cut-off frequency and the pass band gain of the filter given below is :



(A) Cut-off frequency = 1 KHz and Pass band gain = 1

(B) Cut-off frequency = 2 KHz and Pass band gain = 2

(C) Cut-off frequency = 1 KHz and Pass band gain = 3

(D) Cut-off frequency = 3 KHz and Pass band gain = 1

46. The centre frequency of a PLL is determined by the free-running frequency of :

(A) Phase detector
(B) VCO
(C) Low pass filter
(D) Amplifier

47. A 555 monostable multivibrator has R = 1000 KΩ and time delay T = 11s. The value of the capacitance C is

(A) 9 μF
(B) 1 μF
(C) 0.1 μF
(D) 10 μF

48. A 555 timer in monostable application mode can be used as a :

(A) Square wave oscillator
(B) Free-running ramp generator
(C) Frequency divider
(D) Schmitt trigger

49. Low frequency gain in an opamp integrator is limited by adding a :

(A) a capacitor connected in series with the input
(B) a resistor connected in series with the input
(C) a capacitor connected across the output
(D) a resistor connected across the feedback capacitor

50. A non-inverting amplifier with gain unity is known as a :

(A) difference amplifier
(B) voltage follower
(C) summing amplifier
(D) inverter

51. What is the feedback element of a logarithmic amplifier?

(A) a capacitor
(B) a resistor
(C) a diode
(D) an inductor

52. Wienbridge oscillator employs opamp as a :

(A) non-inverting amplifier
(B) inverting amplifier
(C) differential amplifier
(D) none of the above

53. Which code turns into its 9's complement if you switch all the 0's to 1's and 1's to 0's?

(A) 8421 code
(B) BCD code
(C) ASCII
(D) Excess 3 code

54. The number of digit 1 present in the binary representation of $4 \times 256 + 6 \times 32 + 1 \times 16 + 3 \times 2 + 1$ is :

(A) 5
(B) 6
(C) 7
(D) 8

55. A seven-bit hamming code is received as 1111101. What is the correct code?

(A) 1101111
(B) 1011111
(C) 1111011
(D) 1111111

56. An industrial plant has 3 sensors for monitoring machines P, Q and R. The alarm system should activate only when at least 2 machines are running simultaneously. The Boolean expression for the alarm control logic is :

(A) P + Q + R
(B) PQR + PR
(C) PQ + PR
(D) PQ + PR + QR

57. If only the logic inputs X and Y are available (their complements $\overline{X}$ and $\overline{Y}$ are not provided), what is the minimum number of two-input NAND gates needed to realise the Boolean function $X \oplus Y$?

(A) 4
(B) 5
(C) 6
(D) 7

58. Which digital circuit component can function as a parallel-to-serial converter?

(A) Decoder with counter
(B) Digital Counter
(C) Multiplexer with counter
(D) Demultiplexer with counter

59. Which one of the following statements is not correct?

(A) In a ripple carry counter, the addition time remains constant regardless of the number of bits
(B) A full adder circuit can be implemented using two half adders and one OR gate
(C) An 8-bit parallel adder can be built by cascading two 4-bit parallel adders
(D) Carry look ahead is used to enhance the speed of parallel addition

60. A 4-bit Johnson Counter is initialised to 0000 and operates with a synchronous clock. What is the number of binary states that do not appear in its standard cycling sequence?

(A) 2 (B) 8

(C) 12 (D) 16

61. A flip-flop is a :

(A) Combinational logic circuit and edge sensitive

(B) Combinational logic circuit and level sensitive

(C) Sequential Logic circuit and level sensitive

(D) Sequential Logic circuit and edge sensitive

62. A ROM will be utilized to create a "squarer" that produces the square of a 4-bit number. What should the size of the ROM be?

(A) 16 address lines and 16 data lines

(B) 8 address lines and 8 data lines

(C) 4 address lines and 8 data lines

(D) 4 address lines and 16 data lines

63. Which logic families can function with a supply voltage ranging from 3V to 15V?

(A) PMOS (B) CMOS

(C) ECL (D) TTL

64. The output voltage of a 5-bit digital-to-analog converter (D/A) binary ladder with a digital input of 11010 (where logic 0 equals 0 V and logic 1 equals + 10 V) is :

(A) 3.437 V (B) 6.125 V

(C) 8.125 V (D) 9.875 V

65. The time taken for conversion in a 10-bit successive approximation A/D converter, operating at a clock frequency of 1 MHz is :

(A) 10 μs (B) 15 μs

(C) 18 μs (D) 20 μs

66. In the 8086 architecture, which of the following registers does not qualify as a segment register?

(A) CS (B) SS

(C) IP (D) DS

67. Which of the following 8086 instructions is utilized for unconditional branching?

(A) JNZ (B) CALL

(C) REP (D) LOOP

68. A serial communication system employs an 8251 USART (Universal Synchronous/Asynchronous Receiver/Transmitter) operating in asynchronous mode, featuring 8 data bits, 1 stop bit, and no parity. What is the least number of control words required to be written to the 8251 to set it up for this operation?

(A) 1 (Mode Word only)

(B) 2 (Mode word and Command Word)

(C) 3 (Mode word, command word and Status Read)

(D) 4 (Mode word, Command word, Status Read and Data Write)

69. Which of the following operational modes for the 80286 processor ensures backward compatibility with the 8086/8088 and utilizes real memory addresses?

(A) Real Address Mode (B) Protected Mode

(C) Virtual 8086 Mode (D) System Management Mode

70. What is the typical number of external hardware interrupt sources found in the basic 8051 microcontroller?

(A) 1 (B) 2

(C) 4 (D) 6

71. Which instruction of the 8051 is utilized to execute a bit-wise OR operation between the Accumulator and a direct address (either SFR or internal RAM)?

(A) CPL A (B) ANL A, direct

(C) XRL A, direct (D) ORL A, direct

72. If the Program Status Word (PSW) register of the 8051 holds the value D0H, what conclusions can be drawn regarding the chosen Register Bank as well as the status of the Auxiliary Carry Flag (AC) and Carry Flag (CY)?

(A) Register Bank 1 selected, CY = 0, AC = 0

(B) Register Bank 3 selected, CY = 0, AC = 0

(C) Register Bank 0 selected, CY = 1, AC = 1

(D) Register Bank 2 selected, CY = 1, AC = 1

73. Which of the following is a property that the LTI systems follow?

(A) Commutative Property (B) Distributive Property

(C) Associative Property (D) All of the above

74. As per the Shannon's theorem, the channel capacity C is given by the formula _____

(A) $C = B*\log_2 (1 + S/N)^2$ (B) $C = B*\log_2 (1 + S/N)$

(C) $C = B*\log_{10} (1 + S/N)$ (D) $C = B*\log_{10}(1 + S/N)^2$

75. The standard baud rate used in modern serial communications for high-speed data transfer is _____

(A) 9600 Baud (B) 19200 Baud

(C) 38400 Baud (D) 115200 Baud

76. If R is the radius of the earth, which is the correct equation used to estimate the distance (d) to the horizon, when viewing from a height (h)?

(A) $d = \sqrt{(2hR)}$ (B) $d = \sqrt{(hR)}$

(C) $d = \sqrt{(hR\Pi^2)}$ (D) $d = \sqrt{(2hR\Pi^2)}$

77. The earth's stratosphere range is approximately between _____ and _____ Kms.

(A) 0 and 15 Kms (B) 15 and 50 Kms

(C) 50 and 90 Kms (D) Above 90 Kms

78. For an AM wave, if P_T is the transmitting power, P_C is carrier power and m is the modulation index, then the P_T is given by the equation _____

(A) $P_T = Pc (1 + m/2)$ (B) $P_T = Pc (1 + m^2/4)$

(C) $P_T = Pc (1 + m^2/2)$ (D) $P_T = Pc (1 + m^2/10)$

79. In an AM superheterodyne receiver, the intermediate frequency IF is _____

(A) 455 KHz (B) 10.7 MHz

(C) 625 KHz (D) 525 KHz

80. In the _____ modulation technique the minimum channel bandwidth is used.

(A) VSB (B) SSB-SC

(C) DSB-SC (D) AM

81. A pre-emphasis circuit is essentially a _____ and a de-emphasis circuit in FM system a _____

(A) low-pass filter, high pass filter
(B) low-pass filter, low pass filter
(C) high pass filter, high pass filter
(D) high pass filter, low-pass filter

82. Which of the following is not a property of the Discrete Fourier Transform?

(A) Linearity property
(B) Asymmetry property
(C) Convolution property
(D) Multiplication property

83. Among the following, satellite TV Dish uses _____ antenna.

(A) Yagi-Uda
(B) Loop
(C) Log periodic
(D) Parabolic reflector

84. In interlaced scanning technique, the scanning takes place on _____

(A) all lines of an image simultaneously
(B) odd and even lines of an image in separate passes
(C) lines in a random order
(D) lines from top to bottom and then bottom to top

85. The PAL (Phase Alternating Line) color encoding system in analog television broadcasting is characterized by _____

(A) 525 lines per frame, 60 Hz field refresh rate
(B) 312.5 lines per frame, 60Hz field refresh rate
(C) 625 lines per frame, 50 Hz field refresh rate
(D) 525 lines per frame, 25 Hz field refresh rate

86. For long-distance optical communication, _____ band is used because the attenuation of light is minimal in this range.

(A) L
(B) S
(C) Ka
(D) C

87. In digital modulation techniques, the QPSK stand for

(A) Quadrature Phase Shift Keying
(B) Quantity Phase Shift Keying
(C) Quality Phase Shift Keying
(D) Quantized Phase Shift Keying

88. The cellular CDMA uses the frequency band of _____

(A) 824 MHz to 894 MHz

(B) 455 MHz to 525 MHz

(C) 625 MHz to 695 MHz

(D) 812 MHz to 882 MHz

89. TRAPATT diode stands for _____

(A) Transistor P type Avalanche Transferred Transit Time diode

(B) Trapped Plasma Avalanche Triggered Transit Time diode

(C) Trapped Plasma Automatic Transferred Transit Time diode

(D) Transistor P type Powered Automatic Transmitting Transfer Time diode

90. In the RADAR range equation, the range is _____.

(A) directly proportional to transmitted power

(B) inversely proportional to transmitted power

(C) directly proportional to the fourth root of the transmitted power

(D) inversely proportional to the fourth root of the transmitted power

91. An SCR is used in a resistive half-wave rectifier circuit. The SCR is triggered at an angle $\alpha = 45^{\circ}$ in every positive half-cycle. The input is a sinusoidal voltage, and the resulting current waveform is :

- Zero from 0 to α
- Follows the sine shape from α to π.
- Zero during the entire negative half-cycle.

If the peak current is I_m compute the RMS value of the current.

(A) $\left(I_m / 2\sqrt{2}\right)$

(B) $\left(I_m / \sqrt{2}\right)$

(C) $\left(I_m / \sqrt{2}\right) \times \sqrt{\left(\frac{1}{8} + \frac{1}{4\pi}\right)}$

(D) $\left(I_m / \sqrt{2}\right) \times \sqrt{\left(\frac{3}{8} + \frac{1}{4\pi}\right)}$

92. A UJT-based relaxation oscillator is used to trigger an SCR at a firing frequency of 1 kHz. The intrinsic stand-off ratio (η) of the UJT is 0.9, and the time constant of the charging circuit is given as $\tau = 40R$ nanoseconds, where R is the charging resistor in ohms.
Compute the value of R. :

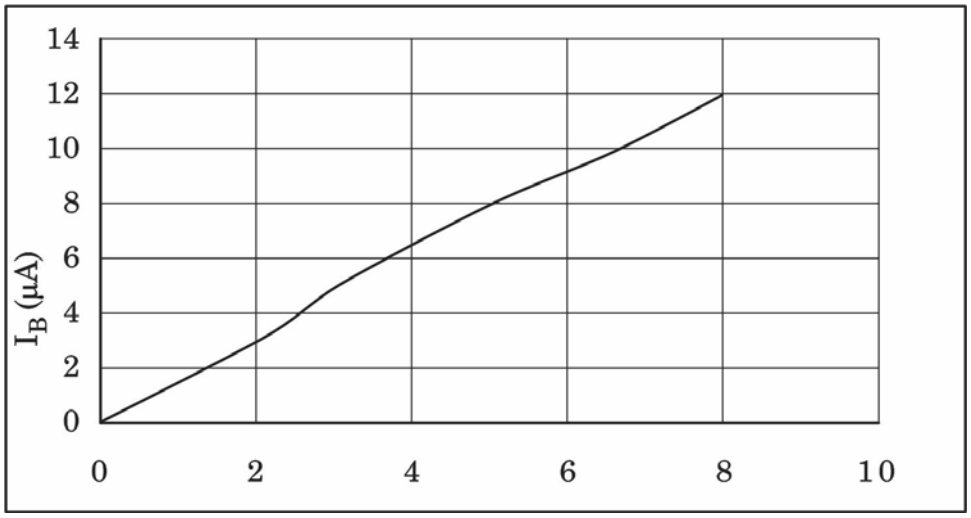
(A) 10.85 $k\Omega$

(B) 12.5 $k\Omega$

(C) 5.427 $k\Omega$

(D) 0.5427 $k\Omega$

93. A phototransistor is used in the design of an optical triggering circuit. It operates under an ambient radiant flux density of 5 mW/cm^2. The device's characteristic curve is shown in the accompanying graph, which gives the photo induced base current I_B as a function of radiant flux density. Assuming a DC current gain $h_{FE} = 40$, calculate the collector current :



(A) 0.24 mA (B) 0.32 mA

(C) 0.36 mA (D) 0.45 mA

94. Which of the following statements about the DIAC are correct?

1. A DIAC is a bidirectional device that conducts current only after its breakover voltage is reached.
2. DIAC can be called as a gateless triac
3. DIAC has symmetrical breakdown characteristics

(A) Statements 2 and 3 are correct

(B) Statements 1 and 3 are correct

(C) Statements 1 and 2 are correct

(D) All the above Statements are correct

95. In a cathode ray tube (CRT) used for precision beam control in oscilloscopes, electrons are emitted from a heated cathode and accelerated through a potential difference of 810 V before entering the deflection system. The magnitude of the electron's velocity upon leaving the accelerating anode is

(Take Electron charge $q = 1.6 \times 10^{-19}\ C$ and Electron mass $m = 9.11 \times 10^{-31}\ kg$)

(A) $8.4 \times 10^6\ m/s$ (B) $12 \times 10^6\ m/s$

(C) $1.414 \times 10^6\ m/s$ (D) $16.8 \times 10^6\ m/s$

96. A $3\frac{1}{2}$ Digital multi meter has a specification of ± (1.0% + 5 counts) and is measuring 15.00 V on the 20 V range. What is the total error?

(A) ± 0.15 V (B) ± 0.18 V

(C) ± 0.20 V (D) ± 0.22 V

97. An analog multimeter rated at 20 kΩ/V sensitivity is used to measure a DC voltage across a load. If the multimeter is set to the 10 V range, which of the following best represents the input resistance presented by the meter to the circuit during this measurement?

(A) The multimeter behaves like a 200 kΩ resistor in series with the measured voltage

(B) The multimeter offers a parallel resistance of 200 kΩ across the load

(C) The meter acts as a 20 kΩ load

(D) The meter draws 20 μA per volt measured

98. A LCD panel has a resolution of 1280 × 720 pixels. Each pixel consists of 3 subpixels (Red, Green, Blue), and each subpixel uses an 8-bit color depth. If one full frame is stored in memory without compression, what is the total memory required to store one frame, in megabytes (MB)?

(A) 2.63 MB (B) 0.88 MB

(C) 21.07 MB (D) 3.3 MB

99. Which of the following is correct for LCD (Liquid Crystal Display) technology compared to other flat-panel display technologies?

(A) Excessive average heat generation during operation than plasma displays

(B) Inability to emit light; requires external illumination

(C) LCDs with LED backlighting consume less power typically than plasma displays in all scenarios, including dark scenes

(D) Fast response time causing motion blur

100. Which of the following statements best highlights a fundamental operational distinction between a laser diode and a Light Emitting Diode (LED) in optoelectronic systems?

(A) Laser diodes emit light with greater luminous efficacy due to their wide emission spectrum

(B) LEDs exhibit coherent light emission due to spontaneous emission processes

(C) Laser diodes require optical feedback and population inversion to achieve stimulated emission

(D) Both LEDs and laser diodes require population inversion for light generation

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