

No. of Pages. 20

Code No.

Y – 3063

Register Number :

Time : 2 Hours

Name :

Max.Marks : 100

**Entrance Examination for Admission to the M.Tech. Courses in the
Teaching Departments, 2026**

CSS

**ELECTRONICS AND COMMUNICATION (OPTOELECTRONICS AND
OPTICAL COMMUNICATION)**

GENERAL INSTRUCTIONS

1. The Question Paper is having 100 Objective Questions, each carrying one mark.
2. The answers are to be marked **only** in the “**OMR Sheet**” provided.
3. **Negative marking** : **0.25 marks** will be deducted for each wrong answer .

INSTRUCTIONS FOR FILLING THE OMR SHEET

- The OMR sheet should not be folded or crushed.
- Use only blue/black ball point pen to fill the circles.
- Use of pencil is strictly prohibited.
- Circles should be darkened completely and properly.
- Cutting and erasing on this sheet is not allowed.
- Do not leave any stray marks on the sheet.
- Do not use marker or white fluid to hide the mark.
- **WRONG METHODS**



CORRECT METHOD



DO NOT WRITE HERE

Choose appropriate answer from the options in the questions.

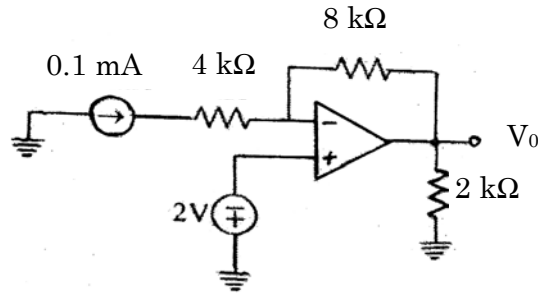
(100 × 1 = 100 marks)

1. The curl of a vector field represents :
 - A. Divergence
 - B. Rate of Expansion
 - C. Rotation or Circulation
 - D. Direction of Field.

19. The negative resistance region in tunnel diode occurs between _____.
- Peak point and valley point
 - Cut-in and breakdown
 - Zero and peak point
 - None of these
20. What is the photocurrent, when 5×10^{12} photons/s arriving at the surface of photoconductor of $\eta = 0.8$, the minority carrier lifetime is 0.5 ns and the device has $\mu_n = 2500 \text{ cm}^2 / \text{V} - \text{s}$, $E = 5000 \text{ V} / \text{cm}$ and $L = 10 \mu \text{m}$.
- $2 \mu \text{A}$
 - $4 \mu \text{A}$
 - $6 \mu \text{A}$
 - $8 \mu \text{A}$
21. In a BJT, the physical dimension of emitter E, base B and collector C in the descending order is _____
- E, B, C
 - E, C, B
 - C, B, E
 - C, E, B
22. A PNP transistor has $V_{EB} = 0.8 \text{ V}$ at a collector current of 1 A. What would be the value of V_{EB} to become $I_c = 10 \text{ mA}$
- 0.68 V
 - 0.35 V
 - 0.17 V
 - 0.08 V
23. The conduction angle in Class B power amplifier is _____
- 90°
 - 180°
 - 270°
 - 360°
24. In a Hartley oscillator $L = 5 \text{ mH}$ and $C = .02 \mu \text{F}$. The frequency of oscillation is _____
- 100 KHz
 - 500 KHz
 - 100 Hz
 - 500 Hz
25. A JFET with $I_{DSS} = 10 \text{ mA}$ and $V_p = -5 \text{ V}$ is biased at $I_D = \frac{I_{DSS}}{4}$. What is the value of g_m at this point?
- 2m A/V
 - 3m A/V
 - 4m A/V
 - 5m A/V

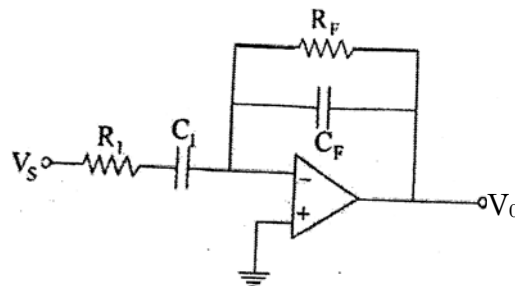
30. An ideal op-amp has :
- A. Finite gain, zero input impedance, infinite output impedance
 - B. Infinite gain, zero input impedance, infinite output impedance
 - C. Zero gain, infinite input impedance, zero output impedance
 - D. Infinite gain, infinite input impedance, zero output impedance

31. For the circuit shown below, the output voltage V_0 is _____



- A. + 2.8 V
- B. - 2.8 V
- C. + 3.3 V
- D. - 3.3 V

32. In the practical differentiator circuit shown in figure, which statement is correct :



- A. R_1 cuts off low frequency noise
- B. R_2 , C_F form the basic differentiation
- C. C_F ensures stable operation
- D. C_F cuts off high frequency noise

33. The output of a phase detector in VCO is :

- A. Constant DC
- B. AC signal only
- C. Error voltage proportional to phase difference
- D. Square wave

69. The greatest negative number which can be stored in computer that has 8-bit word length and uses 2's complement arithmetic is _____

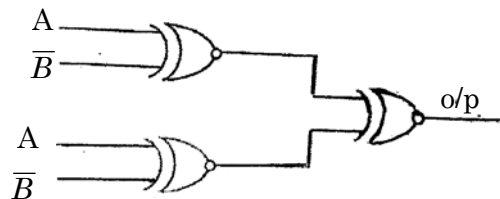
- A. -256
- B. -257
- C. -128
- D. -127

70. The simplified form of the Boolean expression

$Y = (A'BC + D)(A'D + B'C')$ can be written as _____.

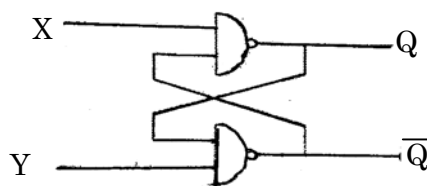
- A. $A'D + B'C'D$
- B. $AD + BC'D$
- C. $(A' + D)(B'C + D')$
- D. $(AD' + BCD')$

71. The output of the below given circuit is _____.



- A. 0
- B. $A'B + AB'$
- C. 1
- D. $A.B$

72. A flip-flop is formed by using two NAND gates as shown in figure. The unstable state corresponds to _____



- A. $X=0, Y=0$
- B. $X=0, Y=1$
- C. $X=1, Y=0$
- D. $X=1, Y=1$

73. A full adder can be implemented with half adders (HA) and OR gates. A 4-bit parallel adder without any initial carry requires _____

- A. 9 HAs and 4-OR gates
- B. 8 HAs and 4-OR gates
- C. 8 HAs and 3-OR gates
- D. 7 HAs and 3-OR gates

74. A master-slave JK flip-flop eliminates race-around condition by _____
- A. Using two latches triggered at opposite clock phase
 - B. Increasing propagation delay
 - C. Using asynchronous inputs
 - D. Reducing clock frequency
75. A D flip-flop can be constructed from a JK flip-flop by making _____
- A. $J = K$
 - B. $J = D, K = D$
 - C. $J = \bar{D}, K = D$
 - D. $J = 0$
76. A RAM chip has 32 rows and 16 columns with a single bit. The number of address lines required to get unique address of every location is _____
- A. 9
 - B. 12
 - C. 18
 - D. 24
77. Which operator is used to get the address of a variable in C?
- A. *
 - B. &
 - C. %
 - D. #
78. Newton-Raphson method is based on _____
- A. Taylor series expansion
 - B. Fourier series
 - C. Interpolation
 - D. Integration
79. A synchronous counter differs from an asynchronous as _____
- A. It uses fewer flip-flops
 - B. All flip-flops are clocked simultaneously
 - C. It is slower
 - D. It uses analog signals
80. Which is a valid declaration in C?
- A. `int a[] = { };`
 - B. `int a[3] = {1,2,3,4};`
 - C. `int a[3] = {1,2,3};`
 - D. `int a[3] - (1,2,3);`

87. The Bus Interface Unit of 8086 is responsible for _____
- A. Arithmetic operations
 - B. Instruction execution
 - C. Fetching instructions and interfacing with memory
 - D. Flag operations
88. The Eigen values of the matrix $\begin{bmatrix} a & 1 \\ a & 1 \end{bmatrix}$ are _____
- A. 0, a + 1
 - B. 0, a - 1
 - C. 0, 0
 - D. A, 0
89. The coefficient a_0 in Fourier Series represents _____
- A. Amplitude
 - B. Frequency
 - C. Phase
 - D. Average (DC component)
90. Fourier Transform of $x(t) = \delta(t-2)$ is _____
- A. 1
 - B. 0
 - C. e^{-2jw}
 - D. e^{2jw}
91. The function $y = x^2 + \frac{250}{x}$, at $x = 5$ attains _____
- A. Maximum
 - B. Minimum
 - C. Neither
 - D. 1
92. If $S = \int_1^{\infty} x^{-3} dx$, then the value of S = _____
- A. 1/3
 - B. 1/4
 - C. 1/2
 - D. 1/5
93. The Laplace Transform of $f(t)$ is $F(s)$ and $F(s) = \frac{s\omega}{s^2 + \omega^2}$. The final value of $f(t)$ is _____
- A. Zero
 - B. Infinite
 - C. 1
 - D. None of these

ROUGH WORK

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