Model Question Paper

Semiconductor devices and their applications - Part IV

12th Standard

Physics

Reg.No. : | | | | | | |

I.Answer all questions.

II.Use blue pen only.

Time : 01:00:00 Hrs

Total Marks : 75

Part-A

5 x 1 = 5

1) The Boolean equation of EXOR gate is Y=A⊕B=

(a) AB.$\overline{\overline{B}\,\overline{A}}$ (b) AB+$\overline{\overline{A}\,\overline{B}}$ (c) A$\overline{B}$+$\overline{A}$B (d) $\overline{\overline{A}\overline{B}}$+$\overline{\overline{A}\overline{B}}$

2) The voltage gain if the non-inverting amplifier is

(a) $A_V = \frac{-R_f}{R_{in}}$ (b) $A_V = 1 + \frac{R_f}{R_{in}}$ (c) $A_V = 1 - \frac{R_{in}}{R_f}$ (d) $A_V = \frac{R_f}{R_{in}} - 1$

3) In a non-inverting amplifier $R_{in} = 10 \quad k\Omega$ and $R_{in} = 490 \quad k\Omega$ then its voltage gain is

(a) 49 (b) 50 (c) 4900 (d) 500

4) The gain of the amplifier is 100. If 9% of the output voltage is fed back into the input through a negative feed back network. Find out the voltage gain after feed back.

(a) 10 (b) 16.66 (c) 11.11 (d) 1000

5) Simple form of Boolean expression $A.\overline{B} + AB + BC + CA$ is

(a) (A+B)C (b) (AB+)C (c) A+(BC) (d) ABC

Part-B

3 x 3 = 9

6) In a common base transistor circuit I_C=0.97 mA and I_B=30 μA Calculate the value of (α) current gain.

7) The voltage gain of an amplifier without feedback is 100.If nagative feedback is applied with a feedback fraction β=0.1.Calculate the voltage gain after feedback.

8) When there is no feedback, the gain of the amplifier is 100. If 5% of the output voltage is fed back into the input through a negative feedback network, find out the voltage gain after feedback.

Part-C

3 x 5 = 15

9) Define current amplification factors α and β and obtain the relation between them.

10) With the circuit diagram, explain voltage divider biasing of a transistor.

11) Describe the construction of zenor diode.

Part-D

5 x 10 = 50

12) Give the fuction of 'OR' and 'NAND' gates.

13) Describe an operational amplifier. Explain its action as (i) inverting amplifier and (ii) noninverting amplifier.

14) Explain with neat circuit diagram, the working of single stage CE amplifier.Draw the frequency response curve and discuss the results.

15) a) Describe the working of a single stage CE amplifier

(OR)

b) What is meant by feedback? Derive an expression for voltage gain of an amplifier with negative feedback.

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