Model Question Paper

Semiconductor devices and their applications - Part II

12th Standard

Physics

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

I.Answer all questions.

II.Use blue pen only.

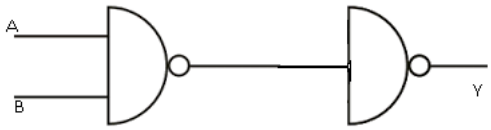
Time : 01:00:00 Hrs

Total Marks : 100

Section-A

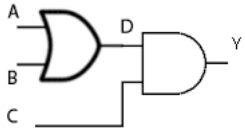
3 x 1 = 3

1) The following arrangement performs the logic function of _____ gate



(a) AND (b) OR (c) NAND (d) EXOR

2) If the output (Y) of the following circuit is 1, the inputs A B C must be



(a) 0 1 0 (b) 1 0 0 (c) 1 0 1 (d) 1 1 0

3) The Boolean expression $\overline{ABC}$ can be simplified as

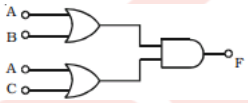
(a) AB + $\bar{C}$ (b) $\bar{A}$. $\bar{B}$. $\bar{C}$ (c) AB + BC + CA (d) $\bar{A}$ + $\bar{B}$ + $\bar{C}$

Section-B

2 x 3 = 6

4) Give the important parameters of an operational amplifier.

5) Find the output F of the logic circuit given below:

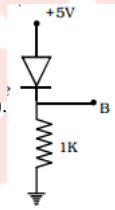


Section-C

3 x 3 = 9

6) The base current of the transistor is 50 μA and collector current is 25 mA. Determine the values of β and α.

7) Find the voltage at the point B in the figure (Silicon diode is used).



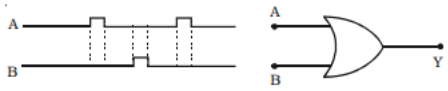
8) The gain of an amplifier, without feedback is 100. If 5% of the output voltage is feed back into the input through a negative feed back network. Find out the voltage gain after feed back.

Section-D

2 x 5 = 10

9) Determine the frequency of oscillations in a Colpitt's oscillator if $C_1 = 0.01\mu F, C_2 = 0.03\mu F$ and L = 100 mH.

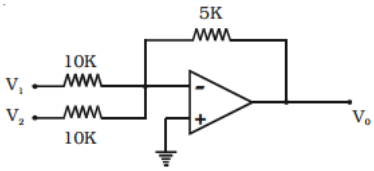
10) If the two waveforms shown in the figure are applied to the OR gate.What is the resulting output waveform?



2 x 5 = 10

11) Describe the valence band, conduction band and forbidden energy gap with the help of energy level diagram.

12) Find the output of the given circuit.



Section-E

4 x 10 = 40

13) Explain the working of a Colpitt's oscillator, with the neat circuit diagram.

14) Describe an operational amplifier. Explain its action as (i) Inverting amplifier (ii) Non-inverting amplifier.

15) a) Describe the CRO. Explain its parts.

(OR)

b) Explain the construction and working of a multimeter?

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