

ADE Model Question Paper-I.

MODULE -1.

- 1a) What is photodiode? explain in detail 6M.
- b) Derive the operating point equations for CE configuration? 8M.
Choose fixed bias configuration.
- c) Explain Astable multivibrator using IC 555? 6M.

OR.

- 2a) With a basic structure, explain optocoupler 6M.
- b) Determine the values of the resistors R_C & R_E for the circuit. 8M.

Given that

$$R_1 = 5k\Omega$$

$$R_2 = 1k\Omega$$

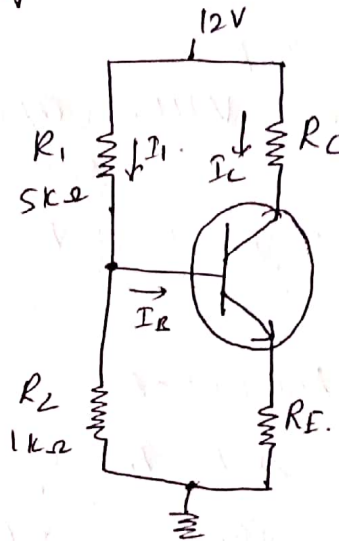
$$\beta = 200$$

$$V_{BE} = 0.7V$$

$$I_1 \gg I_B$$

$$V_{CEQ} = 5V$$

$$I_{CQ} = 2mA$$



- c) Discuss Regulated power supply parameters? 6M.

MODULE 2.

- 3a) Simplify using K-map $f = \sum m(1, 3, 4, 5, 10, 12, 13)$? 6M.
- b) Define SOP & POS? Explain with an example? 6M.
- c) Find min SOP for $F(A, B, C, D) = \bar{A}\bar{C} + \bar{B}C + AC\bar{D} + B\bar{C}D$? 8M.

OR

- 4a) Define prime implicant, essential prime implicant with example? 6M.
- b) Apply Quine McCluskey method & patrick's method (14M) to simplify $F(a, b, c, d) = \sum m(0, 1, 2, 5, 6, 7, 8, 9, 10, 14)$?

MODULE-3

- 5a) Realize $F(a, b, c, d) = \sum m(0, 3, 4, 5, 8, 9, 10, 14, 15)$ using 3-Input NOR gates? 6M.
- b) Write a note on gate delays? 6M.
- c) Explain 7-segment decoder? 8M.

OR.

6a) Write a note on 3-state buffer ? 6M.

b) Realize $F(X, Y, Z) = \sum m(0, 4, 5, 6, 7)$ using PLA ? 6M.

c) Explain 8253 priority encoder ? 8M.

MODULE-4

7a) Write a note on VHDL ? 6M.

b) Explain set-reset latch ? 6M.

c) Explain Master slave JK flip flop using NAND gates ? 8M.

OR.

8a) Write a note on VHDL Operator ? 6M.

b) Explain Switch Contact Debounce circuit ? 6M.

c) Explain edge-triggered D-FF with the help of timing diagram ? 8M.

MODULE-5

9a) Explain 4-bit Data transfer using D flip flop ? 6M.

b) Explain Ring counter ? 6M.

c) Explain sequential parity checker ? 8M.

OR.

10 a) Explain Ripple counter ? 6M.

b) Design mod-7 counter ? 8M.

c) Explain PISO shift register ? 6M.