22320

21222

3 Hours / 70 Marks

15 minutes extra for each hour

Seat No.

Marks

1. **Attempt any FIVE of the following:**   **10**

a) Convert $(1101011)_2 = (\qquad)_{16}$ and

$(1111011)_2 = (\qquad)_8$

b) List triggering methods used for triggering flip flops.

c) Define Minterm and Maxterm w.r.t. K-map.

d) Define shift register and list its types.

e) List any two specifications of IC-DAC 0808.

f) Draw logical circuit diagram of half adder circuit.

g) Write truth table of D type flip-flop.

Marks

2. **Attempt any THREE of the following:**   **12**

a) Convert $(43)_{10} = $ (BCD)

$(34)_{10} = $ (Excess-3)

$(110111)_2 = $ (Gray)

$(11101)_2 = $ (2's complement)

b) Draw logical diagram of full adder using K-map simplification and write truth table.

c) Draw the block diagram of programmable logic Array with proper labels.

d) Draw the circuit diagram of BCD to 7 - segment decoder and write truth table.

3. **Attempt any THREE of the following:**   **12**

a) State and prove two De-Morgan's Theorems.

b) Draw basic gates AND, OR and NOT using NAND gate only.

c) Draw 4 bit ring counter with truth table and its waveform.

d) Compare the following: (Any two points each)

(i) Volatile - Non volatile memory

(ii) SRAM - DRAM memory

4. **Attempt any THREE of the following:**   **12**

a) Realize given boolean expression using basic gates and simplify same.

$y = AB + BC (B+C)$

b) Design 4 bit binary to gray code converter. Using truth table.

c) Realize given expression using K-map

$f(A, B, C, D = \Sigma m (3, 5, 7, 8, 10, 11, 12, 13)$

d) Draw JK master slave flip flop and explain its operations.

e) Calculate analog o/p of 4 bit DAC for digital input is 1100. Assume $V_{FS} = 5V$

Marks

5. **Attempt any __TWO__ of the following:** **12**

a) Draw and explain operation 4 bit universal shift register. Draw necessary waveforms.

b) Draw block diagram of Dual slope ADC and explain its working.

c) Subtract following using Two's complement method.

$(15)_{10} - (32)_{10}$

6. **Attempt any __TWO__ of the following:** **12**

a) Design MOD-12 ripple counter. Write its truth table with waveform.

b) Design 16:1 MUX using 4:1 MUX.

c) Compare TTL and CMOS with following points.

(i) Fan IN

(ii) FAN OUT

(iii) Propogation delay

(iv) Power dissipation

————