Total No. of Questions : 8] **SEAT No. :**

PA-1237 **[Total No. of Pages : 2**

[5925]-259

S.E. (Computer Engineering)

DIGITAL ELECTRONICS AND LOGIC DESIGN

(2019 Pattern) (Semester - III) (210245)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Assume suitable data, if necessary.***

Q1) a) What are sequential circuits? Explain excitation table of JK flipflop. **[6]**

b) Convert Following Flipflops: **[6]**

i) SR to JK

ii) JK to D

c) What is MOD counter? Design MOD - 24 counter using 7490. **[6]**

OR

Q2) a) What are sequential circuits? Explain SR flipflop using a suitable example. **[6]**

b) Convert Following Flipflops: **[6]**

i) JK to T

ii) SR to D

c) Design sequence detector using MS JK flipflop for sequence 1101. **[6]**

Q3) a) Draw ASM chart for 2-bit UP counter using multiplexer controller method. **[6]**

b) Draw a block diagram of the PLA device and explain. **[6]**

c) Implement following Boolean function using PAL. **[5]**

$$F1 = \sum m(0,2,3,4,5,6,7,8,10,11,15)$$

$$F2 = \sum m(1,2,8,12,13)$$

OR

P.T.O.

Q4) a) What is an ASM Chart? Design the ASM chart for a 2-bit binary counter having one enable line E such that when: **[6]**

E = 1 (count enabled) and

E = 0 (counting is disabled).

b) Implement 3 bit binary to gray code converter using PLA. **[6]**

c) A combinational Circuit is defined by the following function: **[5]**

$$F1(A,B,C) = \sum m(0,1,3,7)$$

$$F2(A,B,C) = \sum m(1,2,5,6)$$

Implement this circuit with PLA.

Q5) a) Explain the operation of TTL NAND gate. **[6]**

b) Compare TTL and CMOS families and also draw CMOS-NOR Gate. **[6]**

c) Define the following terms and mention the standard values for TTL logic Family: **[6]**

i) Noise Margin

ii) Power Dissipation

iii) Propagation Delay

OR

Q6) a) Explain TTL open collector. **[6]**

b) Draw and explain the circuit diagram of the CMOS Inverter. **[6]**

c) Draw two input standard TTL NAND gate circuit and explain their operation. **[6]**

Q7) a) What is Microprocessor? Explain the system bus in brief. **[6]**

b) Which are various functional units of microprocessors? Explain ALU in brief. **[6]**

c) How Basic Arithmetic operations are performed using ALU IC 74181? **[5]**

OR

Q8) a) What is Microprocessor? Explain various operations of the microprocessor. **[6]**

b) Explain the Memory organization of the microprocessor. **[6]**

c) Explain the 4-bit Multiplier circuit using ALU and shift registers in brief. **[5]**