

Total No. of Questions : 8]

SEAT No. :

PD-5277

[Total No. of Pages : 2

[6402]-23R

**S.E. (Electronics & Computer) (Electronics/E&TC)
(Electronics-VLSI Design & Technology/
Electronics & Comm.-(A.C.T.))
DIGITAL CIRCUITS**

(2019 Pattern) (Semester - III) (204182)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8 .
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.

- Q1)** a) Design a full adder using 2 half adders. [7]
b) Design and implement one bit comparator. [5]
c) Design 16:1 multiplexer using two 8:1 multiplexer. [5]

OR

- Q2)** a) Design and explain 1:4 DEMUX with block diagram, truth-table, equation and logic diagram. [7]
b) Implement the full subtractor using a 1:8 demultiplexer. [5]
c) Draw and explain the look-ahead carry generator. [5]

- Q3)** a) Design a sequence generator using T FFs for sequence 1101. [8]
b) Distinguish between synchronous counter and asynchronous counter. [5]
c) Explain with diagram the working of D type Flip-flop. Give its truth table. [5]

OR

P.T.O.

- Q4)** a) Draw and explain 3 bit asynchronous counter using JK FF. [8]
 b) Design a 3 bit twisted ring counter. Draw logic diagram. [5]
 c) Compare Moore and Mealy machines. [5]

- Q5)** a) What do you mean by excitation table of flip flop? Write the excitation table of [9]

- i) D flip flop
 ii) J-K flip flop

- b) Explain : [8]

- i) State Table
 ii) State Diagram
 iii) State Assignment
 iv) ASM chart

OR

- Q6)** a) Design a sequence detector to detect a sequence 1101 using D FF (Use Moore machine) [9]

- b) Explain in short:
 i) Moore Machine [8]
 ii) Mealy Machine

- Q7)** a) Explain block diagram of FPGA with its basic characteristics. [8]

- b) Write short notes on memories. [10]

OR

- Q8)** a) Implement following Boolean function using PAL. [8]

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

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

- b) Describe with neat diagram AND-OR structure of PLA and PAL. [10]

