Total No. of Questions : 8]

SEAT No. :

PD-5277

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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

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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

ii) Mealy Machine **[8]**

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 = Σ m (0, 2, 3, 4, 5, 6, 7, 8, 10, 11, 15)

F2 = m Σ (1, 2, 8, 12, 13).

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

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