Total No. of Questions : 4]

SEAT No. :

PA-11

[Total No. of Pages : 2

[5931]-17
S.E. (Electrical)
ANALOG & DIGITAL ELECTRONICS
(2019 Pattern) (Semester - I) (203143)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Solve Q1 or Q2, Q3 or Q4.***
2) ***Figures to the right indicate full marks.***
3) ***Neat diagrams must be drawn wherever necessary.***
4) ***Assume suitable data, if necessary.***

Q1) a) Plot the following Boolean expressions on K Map **[5]**

i) $Y = ABC + \overline{A}\,\overline{B}C + AB\overline{C}$

ii) $Y = \overline{A}B\overline{C}\,\overline{D} + A\overline{B}C\overline{D} + \overline{A}BC\overline{D} + A\overline{B}CD + AB\overline{C}D$

b) Minimize the following Boolean function-using K Map **[5]**

$F(A, B, C, D) = \sum m(0, 1, 3, 5, 7, 8, 9, 11, 13, 15)$

c) Describe the function of half adder with its logic diagram and truth table. **[5]**

OR

Q2) a) Draw logical diagram of 8:3 encoder. Explain its working with truth table. **[5]**

b) Prove the following using the Boolean algebra theorems **[5]**

i) $A + \overline{A}.B + A.\overline{B} = A + B$

ii) $A.B + \overline{A}.B + \overline{A}.\overline{B} = \overline{A} + B$

c) What is meant by SOP and POS form of reduction? Explain one with example. **[5]**

P.T.O.

Q3) a) State difference between synchronous and asynchronous counters (5 points). **[5]**

b) Draw and explain Asynchronous Up-Down counter. **[5]**

c) What is meant by shift register? List different types of shift register. **[5]**

OR

Q4) a) Design and explain the operation of MOD 10 asynchronous counter. **[5]**

b) Explain twisted ring counter in detail with truth table. **[5]**

c) Draw circuit diagram and explain 4 bit universal shift register. **[5]**

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