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(Estd. u/s 3 of the UGC Act, 1956)

ECB2181 – ELECTRONICS FOR MECHANICAL SYSTEMS

Assignment Part 1

Question numbers are given in the table:

RRN End with	Question No				
0	3	7	10	2	6
1	5	10	4	6	9
2	3	2	9	7	5
3	1	8	3	5	6
4	2	1	10	9	3
5	7	3	8	10	6
6	7	8	9	3	4
7	5	2	3	10	9
8	8	7	3	9	6
9	5	8	6	9	10

Questions:

1

Decimal	Binary	Octal	Hexadecimal
$(34.6)_{10}$	$(1010110)_2$	?	?
$(446.25)_{10}$	?	?	$(1BE.4)_{16}$
?	$(1010111.011)_2$	$(127.3)_8$	?

Show each conversion with proof

2

Decimal	Binary	Octal	Hexadecimal
?	?	$(657)_8$	$(1AF)_{16}$
?	$(11100101)_2$	$(345)_8$	?
$(67)_{10}$	?	?	$(43)_{16}$

Show each conversion with proof

3 Perform 1's compliment subtraction for the following
$(12)_{10} – (15)_{10}$
$(25)_8 – (32)_8$
$(1100)_2 – (1001)_2$
$(31F)_H – (12A)_H$

4 Perform 2's compliment subtraction for the following
$(356)_{10} – (234)_{10}$
$(1234)_8 – (2313)_8$
$(10011)_2 – (10101)_2$
$(DEF)_H – (ABC)_H$

5 Draw all the logical gates with their expression and truth table

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6 Prove x.x = x and x+1 =1 using postulates

7 Draw logical diagram for the following functions:
F1= XYZ'
F2 = X+Y'Z
F3 = X'Y'Z'+X'YZ+XY'
F4 = XY'+X'Z

8 Demonstrate by means of truth table the validity of the following identities:
(i) (xyz)' = x'+y'+z'
(ii) x+yz = (x+y)(x+z)
(iii) xy+x'z+yz = xy+x'z

9 Given the following Boolean function
F= xy'z + x'y'z + w'xy + wx'y + wxy
a. Obtain the truth table of the function
b. Draw the logic diagram using the original Boolean expression
c. Simplify the function to minimum number of literals using Boolean algebra.
d. Obtain the truth table of the function from the simplified expression and show that it is the same as the one in part (a)

10 Simplify the following expression using K map
F(x,y,z) = Σ(2,3,4,5)
F(x,y,z) = Σ(0,2,4,5,6)
F = A'C + A'B +AB'C + BC