



Reg. No. :

Name :

Third Semester B.Tech. Degree Examination, January 2015
(2008 Scheme)
08.305 – DIGITAL SYSTEM DESIGN (RF)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

1. Convert the following numbers to the base specified :

- a) $(89AC \cdot 1B9)_{16}$ to binary
- b) $(7650 \cdot 54)_8$ to flexa decimal.

2. What is meant by Gray code ? Explain.

3. Subtract the following no.s using r's complement method of addition :

- a) $(101011.011)_2 - (10110.1110)_2$
- b) $(4532.120)_6 - (312.02)_6$

4. State and prove Demorgan's Laws.

5. Using K-Map reduce the expression given to minimum sum of products form :

$$X = A + \overline{BC} + \overline{CD}$$

6. Design a half-subtractor circuit.

7. Explain the working of a multiplexer.

8. Show how a JK Flip-Flop is converted to D-Flipflop and T-Flipflop.

9. Differentiate between sequential and combinational circuit.

10. Explain the working of a clocked RS-Flipflop.



(10x4=40 Marks)



PART – B

Answer **any one** question from **each** Module. **All** questions carry **equal** marks.

Module – I

11. a) Perform the following operations :

i) $(254.12)_6 + (142.3)_6$

ii) $1101.01 \div 110$

iii) $(1356.75)_8 - (7613.015)_8$

iv) $(123.12)_4 \times 21_4$

v) $(296.2A)_{12} + (57.09)_{12}$

(5×2=10 Marks)

b) Briefly discuss the representation of floating point numbers. 6

c) Obtain the weighted binary code for base – 12 digits using weight of 5421. 4

OR

12. a) Convert the following to the base specified

i) $(8A.9)_{16}$ to binary

ii) $(01000110)_{\text{Excess-3}}$ to decimal

iii) 107_{10} to Excess-3

iv) $(11000010001)_{\text{Gray}}$ to Binary

v) $(1111\ 0111\ 01110)_2$ to Gray.

(5×2=10 Marks)

b) Perform the following BCD addition :

i) $010101100001 + 011100001000$

ii) $10011000 + 10010111$

iii) $00100101 + 00100111$

iv) $10000101 + 00010011$

(4×2.5=10 Marks)

Module – II

13. a) Design a code converter that converts a decimal digit from the 8, 4, – 2, – 1 code to BCD. 10

b) Explain the working of a carry-look-ahead adder. Specify its advantages. 10

OR



14. a) The following boolean expression $BE + B'DE'$ is a simplified version of the expression $A'BE + BCDE + BC'D'E + A'B'DE' + B'C'DE'$. Does there exist any Don't care condition? If so, what are they? 10
- b) Simplify the following Boolean expression 'F' together with the Don't-care conditions 'd'. 10
- $F(A, B, C, D) = \sum (0, 6, 8, 13, 14)$
- $d(A, B, C, D) = \sum (2, 4, 10).$

Module – III

15. a) Design a Binary ripple counter. 15
- b) Give the excitation table for T-Flipflop. 5

OR

16. Write notes on the following :
- i) Shift-register
 - ii) State Diagram
 - iii) State reduction
 - iv) Vace-around condition.



(4×5=20 Marks)