B. Tech. Sem - III (Electronics) 2014 COURSE) (CBCS) : WINTER - 2018

SUBJECT: DIGITAL LOGIC CIRCUITS

Day: Friday
Date: 30/11/2018

Time: 10.00 AM TO 01.00 PM
Max. Marks: 60

W-2018-2303

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Assume suitable data if **NECESSARY**.

Q.1 **a)** Simplify the following logic expressions using Boolean algebra: **(10)**

i) $(A+B)(A+\bar{B})$

ii) $ABC+A\bar{B}C+AB\bar{C}$

iii) $(A+B)(A+\bar{B})(\bar{A}+C)$

iv) $A+AB+ABC$

v) $AB+A(B+C)+B(B+C)$

OR

Give the classification of binary codes and describe in detail. **(10)**

Q.2 **a)** Design a full adder using 3:8 Decoder IC 74138. **(06)**

b) Differentiate between Demultiplexer and Decoder. **(04)**

OR

Describe with suitable examples rules for BCD addition and design 1-digit BCD adder using IC IC74LS83 **(10)**

Q.3 State various characteristics of digital ICs. Describe any four characteristics of TTL ICs. **(10)**

OR

a) State the advantages and disadvantages of ECL logic family over other logic families. **(06)**

b) What are the advantages of Totempole structure? **(04)**

Q.4 **a)** What is a Flip Flop? Mention the different types of Flip Flops. **(06)**

b) State the disadvantages of R-S Flip Flop. Mention the way it can be avoided? **(04)**

OR

For the clocked J-K Flip Flop, write the state table. Draw the state diagram and write the state equation. **(10)**

P. T. O.

Q.5 Draw & Describe with neat circuit diagram 3-bit Johnson counter. Draw the relevant output waveforms. **(10)**

OR

Design a sequence generator to generate the following pulse train using shift register: **(10)**

11001110.

Q.6 Implement the following Boolean function using a suitable PAL: **(10)**

i) $W(A,B,C,D)=\Sigma m(1,3,4,6,9,11,12,14)$

ii) $X(A,B,C,D)=\Sigma m(1,3,4,6,9,11,12,14,15)$

iii) $Y(A,B,C,D)=\Sigma m(0,2,4,6,8,12)$

iv) $Z(A,B,C,D)=\Sigma m(2,3,8,9,12,13)$

OR

Describe the concept of RAM. Mention its types. Briefly describe with neat diagram working of any one type of RAM. **(10)**

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