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FOURTH SEMESTER B.Tech.[CO/IT/SE]

MID SEMESTER EXAMINATION MARCH-2019

EC262 DIGITAL ELECTRONICS

Time: 1 and 1/2 Hours **Max. Marks: 30**

Answer All Questions Assume suitable missing data, if any

1. What is Ex-3 code? Write its properties. Design a circuit to convert 8421 BCD code to Ex-3 code. [4]
2. Simplify the function $P = \pi M(1,2,4,5,9,11,12,15) + \varphi M(0,6)$ using Tabular Method and implement the same by logic gates. [6]
3. Answer the following:
   (i) Difference between synchronous and Asynchronous circuits
   (ii) Convert 24610 to Octal and hexadecimal number
   (iii) Excitation table for SR Flip Flop and explain briefly
   (iv) EX-OR gate using four NAND gates [4]
4. A safe has five locks, v, w, x, y, and z, all of which must be unlocked for the safe to open. The keys to the locks are distributed among five executives in the following manner:
   (i) A has keys for locks v and x;
   (ii) B has keys for locks v and y;
   (iii) C has keys for locks w and y;
   (iv) D has keys for locks x and z;
   (v) E has keys for locks v and z.

   (a) Determine the minimum number of executives required to open safe.
   (b) Find all the combinations of executives that can open the safe. Write an expression f (A, B, C, D, E) which specifies when the safe can be opened as a function of which executives are present.
   (c) Who is the "essential executive" without whom the safe cannot be opened? [6]
5. With neat circuit diagram, explain the of JK flip-flop and its solution to overcome racing condition. [4]
6. (a)Design a binary Full Subtractor by using only one [4]
   (i) 4:1 Mux along with basic gates
   (ii) 2:1 Mux along with basic gates

   (b) Compare combinational circuit with sequential circuit [2]