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[5252]-535

S.E. (E&TC/Electronics) (First Semester) EXAMINATION, 2017

DIGITAL ELECTRONICS

(2015 PATTRN)

Time : Two Hours

Maximum Marks : 50

N.B. :— (i) Solve Q. No. 1 or Q. No. 2; Q. No. 3 or Q. No. 4;
Q. No. 5 or Q. No. 6 and Q. No. 7 or Q. No. 8.

(ii) Neat diagrams must be drawn wherever necessary.

(iii) Figures to the right indicate full marks.

(iv) Use of logarithmic tables, slide rule, Mollier charts, electronic, pocket calculator and steam tables is allowed.

(v) Assume suitable data, if necessary.

1. (a) Design full adder using logic gates. [4]

(b) Minimize the following expression using K-map and implement using logic gates :
$$Y = \sum m(1, 3, 5, 9, 11, 13)$$

[4]

(c) Write a short note on one-bit memory cell. [4]

2. (a) Design 3-bit binary to gray code converter [6]

(b) Draw and explain 4-bit Ring counter [6]

3. (a) Draw and explain the working of 2-input CMOS NAND gate. [6]

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- (b) Explain state diagram and state table with suitable example. [6]
4. (a) Explain the following characteristics of digital IC's : [6]
 (i) Fan in
 (ii) Fan out
 (iii) Propagation delay.
 (b) Write short note on state reduction with suitable example. [6]
5. (a) Explain in detail the architecture of PLA. [6]
 (b) Implement the following functions using PLA : [4]

$$F1 = \sum m(1, 3, 5, 7)$$

$$F2 = \sum m(0, 2, 4, 6).$$

 (c) List out advantages of semiconductor memories. [3]
6. (a) Draw circuit of one-cell of static and explain its working. [6]
 (b) Differentiate between ROM and RAM. [4]
 (c) State advantages of PLD over fixed function IC. [3]
7. (a) Draw and explain interrupt register in detail of 8051. [6]
 (b) Differentiate microprocessor and microcontroller. [4]
 (c) List advantages of microcontroller. [3]
8. (a) Draw and explain block diagram of microcontroller. [6]
 (b) Explain the use of program counter. [4]
 (c) Explain ACALL instruction. [3]