PG – 447

I Semester M.C.A. Degree Examination, January 2017
(CBCS)
COMPUTER SCIENCE
MCA 103T : Digital Electronics and Microprocessor

Time : 3 Hours | Max. Marks : 70

Instruction : *Answer* ***any five*** *questions from Section – A and answer* ***any four full*** *questions from Section – B.*

SECTION - A

(5×6 = 30)

1. a) Convert $(345.765)_{10}$ to binary, octal and hexadecimal number system. **(3+3)**

   b) Subtract 10111 from 11000 using 2's complement method

2. a) Simplify the expression f (A, B, C) $\overline{ABC + A\overline{B}} + BC$ and draw the logic diagram for the simplified expression **(3+3)**

   b) State Demorgan's theorem and prove any one.

3. Express the Boolean expression f (x, y, z) = x + yz in SOP and POS form and write its minterm designation form

4. Simplify the following function using K-map technique

   f (A, B, C, D) = $\sum$m (0, 1, 2, 3, 7, 8, 9, 10, 14) and draw the logic diagram for the simplified expression.

5. Define combinational logic circuit. With relevant truth table and expression show the implementation of full adder.

6. With a neat circuit diagram and truth table briefly explain the working of clocked T flipflop. Write its characteristic equation and excitation table.

7. Design mod 8 synchronous counter using D flipflop.

8. What is shift register ? Explain various types of shift register.

P.T.O.

SECTION – B

(4x10=40)

9. a) Explain instruction queue and general purpose registers of 8085. (8+2)

   b) What is the memory addressing capability and maximum size of data segment memory ?

10. a) Briefly explain MIN/MAX mode of operation of 8086. (4+6)

   b) Explain instruction template of 8086 with suitable example template.

11. Explain the function of following pins of 8086.

   i) ALE

   ii) $\overline{DEN}$

   iii) HOLD

   iv) M / IO

   v) $\overline{BHE}$

12. a) Explain memory addressing modes of 8086 with suitable example (5+5)

   b) Write an assembly language program to multiply 8 bit number with 16 bit number.

13. Explain the following instructions of 8086

   i) MOV DL, CL

   ii) SUB BX, DX

   iii) CWD

   iv) OR CL, [BX + SI]

   v) JNB 8 bit

14. Explain hardware interrupts of 8086 in detail. Also explain how 8086 responds to occurrence of interrupt.