

Master of Science (M.Sc.) Semester—I (CBCS) (Computer Science) Examination**DIGITAL ELECTRONICS AND MICROPROCESSOR****Paper—3****Paper—III**

Time : Three Hours]

[Maximum Marks : 80

N.B. :— (1) **ALL** questions are compulsory and carry equal marks.

(2) Draw neat and labelled diagrams wherever necessary.

EITHER

1. (a) What is Code ? Explain various weighted and non-weighted codes. 8
- (b) Explain 1's and 2's complement method of binary subtraction with suitable example. Compare these two methods. 8

OR

- (c) What are the different number systems ? What is the necessity of different number systems ? Explain. 8
- (d) What are the Universal gates ? Construct AND, OR, NOT, EXOR and NAND gate using NOR gate only. 8

EITHER

2. (a) What is Boolean Algebra ? State and prove distributive law and De Morgan's theorem. 8
- (b) Draw and explain the working of 4 bit Parallel Adder. 8

OR

- (c) Explain with logic diagram and truth table the working of decimal to BCD encoder. 8
- (d) What is K-map ? What is its utility ? Reduce the following expression using K-map and draw logic diagram

$$f(ABCD) = \sum m (1, 3, 5, 6, 8, 9, 12, 13, 14, 15). \quad 8$$

EITHER

3. (a) Explain the construction and working of Clocked RSFF using NAND gates. 8
- (b) Draw a logic diagram, truth table timing diagram of 4 bit ring counter and explain its working. 8

OR

- (c) Define MOD of counter. Describe working of MOD6 Counter along with logic diagram, timing diagram and truth table. 8
- (d) What is Shift Register ? Give its classification. Explain the construction and working of a 4 bit shift SISO Register. 8

EITHER

4. (a) Draw a block diagram of 8086 microprocessor and explain each block in brief. 8
(b) Write an ALP to find square root of given number. 8

OR

- (c) What are assembler directives ? Explain the following directives :
(i) Public
(ii) ORG
(iii) Extern. 8
(d) What is flag Register ? Explain flags of 8086 in detail. 8
5. (a) What is Gray code ? Explain Gray code with its advantages. 4
(b) Draw logic diagram of full subtractor and explain its working. 4
(c) Explain Synchronous and Asynchronous counter. 4
(d) What are addressing modes ? Explain any one addressing mode. 4