

MCA
(SEM-III) THEORY EXAMINATION 2018-19
INTRODUCTION TO PROGRAMMING & COMPUTER ORGANISATION

*Time: 3 Hours**Total Marks: 70*

- Note:** 1. Attempt all Sections. If require any missing data; then choose suitably.
 2. Any special paper specific instruction.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

- a. What is polling?
- b. Explain different types of bus.
- c. Add the following signed integers-93 and 44.
- d. Differentiate between Algorithm and flow chart.
- e. What is a floating point overflow error?
- f. What is pipeline speedup?
- g. Explain about Duality Principle.

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

- a. Show that the relation R in the set A of all the books in a library of a college, given by $R = \{(x,y) : x \text{ and } y \text{ have same number of pages}\}$ is an equivalence relation.
- b. Draw the functional block diagram of a Digital Computer and discuss its components in brief.
- c. Explain CISC and RISC architecture of microprocessor.
- d. What are the different data types of conditionals and branching, looping statements? Discuss.
- e. What is the function? Explain the various categories of function.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

- (a) Prove the following by using the principle of mathematical induction for all $n \in \mathbb{N}$:

$$1^3 + 2^3 + 3^3 + \dots + n^3 = (n(n+1)/2)^2$$
- (b) Discuss the following:
 - (i) Ordered sets with example
 - (ii) Types of relation with examples.

4. Attempt any *one* part of the following: 7 x 1 = 7

- (a) Differentiate synchronous and asynchronous sequential circuits. Explain the problem in asynchronous circuits.
- (b) Minimize the following standard POS expression using K-map.

$$Y = \prod M (0, 2, 3, 5, 7)$$

5. **Attempt any *one* part of the following:** **7 x 1 = 7**
- (a) Explain the Fixed Point and Floating Point Number Representations with examples.
 - (b) Explain micro programmed CPU organization with the help of a diagram.
6. **Attempt any *one* part of the following:** **7 x 1 = 7**
- (a) What do you mean by flow chart? Draw flow chart to calculate factorial of given number N.
 - (b) What do you understand by the primitive data types? Discuss with suitable examples.
7. **Attempt any *one* part of the following:** **7 x 1 = 7**
- (a) What is algorithm? Write an algorithm to multiply two matrixes A (3,3) and B (3,3) of integers and store the results in matrix C.
 - (b) Write a note on the storage classes-scope and life time in detail with example.

