

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

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21
- 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.
 - Draw the functional block diagram of a Digital Computer and discuss its components in brief.
 - Explain CISC and RISC architecture of microprocessor.
 - What are the different data types of conditionals and branching, looping statements? Discuss.
 - What is the function? Explain the various categories of function.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7
- Prove the following by using the principle of mathematical induction for all $n \in \mathbb{N}$:
 $1^3 + 2^3 + 3^3 + \dots + n^3 = (n(n+1)/2)^2$
 - Discuss the following:
 - Ordered sets with example
 - Types of relation with examples.
4. Attempt any *one* part of the following: 7 x 1 = 7
- Differentiate synchronous and asynchronous sequential circuits. Explain the problem in asynchronous circuits.
 - 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.

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