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Sub Code: RCAA01

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MCA

(SEM I) THEORY EXAMINATION 2017-18

INTRODUCTION TO PROGRAMMING AND COMPUTER ORGANIZATION

Total Marks: 100

Time: 3 Hours

Notes: Attempt all Sections. Assume any missing data.

SECTION A

2 x 7 = 14

1. Attempt all questions in brief.

- a. Discuss in brief various properties of equivalence relations.
- b. What do you mean by composition of function? Give proper example.
- c. What is system bus? Explain Different types of bus.
- d. Differentiate between algorithm and program.
- e. What is micro instruction?
- f. Name various argument passing methods.
- g. What is the scope of a global variable?

SECTION B

7 x 3 = 21

2. Attempt any three of the following:

- a. Discuss various operators along with their precedence and associativity.
- b. Draw the block diagram of digital computer and explain in detail.
- c. Minimize following Boolean function using tabular method:
 $F(A,B,C,D) = \sum m(4,5,6,8,9,10,13) + \sum d(2,7,15)$
- d. Explain CISC and RISC architecture of microprocessor.
- e.

SECTION C

7 x 1 = 7

3. Attempt any one part of the following:

- (a) Show that for any two sets, A and B:
 $A - (A \cap B) = A - B$.
Also draw Venn diagrams for both.
- (b) What do you mean by inverse function? Find the inverse function of $f(x) = x^3 + 1$. Also prove that composition of two invertible function is also an invertible function.

7 x 1 = 7

4. Attempt any one part of the following:

- (a) Draw various topologies and explain each in detail.
- (b) Attempt the followings
 - i) What do you mean by signed magnitude representation?
 - ii) Minimize the following logic function using k-map
 $Y(A,B,C,D) = \sum m(0,1,2,3,4,7,8,9,10,11,12,14)$

7 x 1 = 7

5. Attempt any one part of the following:

- (a) Explain the term Instruction and arithmetic pipelining. Enumerate the sa
- (b) Discuss hazards and hazard detentions in the memory system used in pipeline with example.

6. Attempt any *one* part of the following:

7 x 1 = 7

- (a) Write a program using recursion to print the Fibonacci series up to given number of steps.
- (b) What is conditional operator? How many operands are required to use conditional operator? Write a program to check the given year is leap year or not using conditional operator.

7. Attempt any *one* part of the following:

7 x 1 = 7

- (a) What are the characteristics of a good instruction format? Explain the types of instruction format.
- (b) Write short note on followings:
 - i) Computer memory hierarchy
 - ii) Parallel processing Vs Pipelining.