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Sub Code: RCAA01

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MCA

(SEM I) THEORY EXAMINATION 2017-18

INTRODUCTION TO PROGRAMMING AND COMPUTER ORGANIZATION

Time: 3 Hours

Total Marks: 100

Notes: Attempt all Sections. Assume any missing data.

SECTION A

1. Attempt all questions in brief. 2 x 7 = 14
- Discuss in brief various properties of equivalence relations.
 - What do you mean by composition of function? Give proper example.
 - What is system bus? Explain Different types of bus.
 - Differentiate between algorithm and program.
 - What is micro instruction?
 - Name various argument passing methods.
 - What is the scope of a global variable?

SECTION B

2. Attempt any three of the following: 7 x 3 = 21
- Discuss various operators along with their precedence and associativity.
 - Draw the block diagram of digital computer and explain in detail.
 - Minimize following Boolean function using tabular method:
 $F(A,B,C,D) = \sum m(4,5,6,8,9,10,13) + \sum d(2,7,15)$
 - Explain CISC and RISC architecture of microprocessor.
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SECTION C

3. Attempt any one part of the following: 7 x 1 = 7
- Show that for any two sets, A and B:
 $A - (A \cap B) = A - B$.
 Also draw Venn diagrams for both.
 - 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.
4. Attempt any one part of the following: 7 x 1 = 7
- Draw various topologies and explain each in detail.
 - Attempt the followings
 - What do you mean by signed magnitude representation?
 - Minimize the following logic function using k-map
 $Y(A,B,C,D) = \sum m(0,1,2,3,4,7,8,9,10,11,12,14)$
5. Attempt any one part of the following: 7 x 1 = 7
- Explain the term Instruction and arithmetic pipelining. Enumerate the sa
 - 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.