

COMPUTING AND INFORMATICS

*Time : Three hours*

*Maximum marks : 100*

*Answer FIVE questions, taking ANY TWO from Group A, ANY TWO from Group B and ALL from Group C.*

*All parts of a question ( a, b, etc.) should be answered at one place.*

*Answer should be brief and to-the-point and be supplemented with neat sketches. Unnecessary long answers may result in loss of marks.*

*Any missing or wrong data may be assumed suitably giving proper justification.*

*Figures on the right-hand side margin indicate full marks.*

**Group A**

1. (a) What is an algorithm and a flow-chart? Taking a simple problem as an example, give an algorithm for that problem and also its corresponding flow-chart. 7
- (b) Illustrate call-by-value and call-by-reference with suitable examples. 7
- (c) Write a C++ program to read 100 numbers from the user and output their sum. 6
2. (a) What is function overloading in C++? Explain with a suitable example. 6

- (b) What is a constructor? Explain its use using an example. 6
- (c) What is a recursive function? Write a recursive function, factorial (), for computation of factorial of an integer. Also, show execution of fact(3). 8
3. (a) Write a program to sort an array of 100 integral numbers. 10
- (b) Discuss the functionalities of different TCP/IP layers. 10
4. (a) What do you mean by office automation? Explain the primary activities relating to office automation. 8
- (b) Explain the stages of compilation for a C compiler. 8
- (c) What is an interpreter? 4

### Group B

5. (a) Show that  $A + \bar{A}B = A + B$  6
- (b) What is an operating system? Discuss about different types of operating systems. 6
- (c) Explain the working of NAND latch with a diagram. 8
6. (a) Explain the purpose of following DOS commands: 6×2
- C: DIR MD CD COPY Del
- (b) Explain the concepts of pipelines and filters in UNIX operating system with suitable examples. 4+4

7. (a) Explain the difference between primary and secondary computer memory. 4
- (b) Discuss briefly the role of secondary storage. 4
- (c) How does the CPU execute program instructions? Explain using a block diagram. 12
8. (a) Compare a system software and an application software. Give examples of each. 6
- (b) Draw truth table for the Boolean function  $f(A, B, C) = A \oplus B \oplus C$  6
- (c) Explain the organization and working of a hard disk. 8

### Group C

9. Answer the following: 10×2
- (i) What is the purpose of exit() command?
- (ii) What is a global variable? How long does a global variable remain alive?
- (iii) What do you mean by a pointer variable in C programming? Give an example.
- (iv) Explain how one can recall a previously used DOS command by pressing some key.
- (v) What happens when the following command is used?  
 $\text{chmod u=rwx,go=r-x foo}$
- (vi) Transform  $(37.24)_8$  into its equivalent binary form.