

This question paper contains 4 printed pages.

8081

Your Roll No.

B.Sc. / I

JS

COMPUTER SCIENCE— Paper I

(Programming Fundamentals and Data Structures)

(Admissions of 1999 and onwards)

Time : 3 hours

Maximum Marks : 38

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

All questions are compulsory.

Parts of a question must be answered together.

1. (a) What is the minimum number of iterations that:

(i) a while loop could make?

(ii) A do while loop could make?

1

(b) Evaluate:

(i) $9/(3*3)+5\%3$

(ii) $9/3*3+5\%3$.

1

(c) For $x=5$, compute the value of y by the following statement:

$y=(x>10? 3:30);$

1

P. T. O.

(d) Explain the meaning of the following function prototypes:

(i) `int*p(char a[]);`

(ii) `int*p(char*a[]);` 2

(e) What is the difference between structure and union? 2

2. (a) What is the output of the following program segments?

(i) `int a=8, b=4, c,d;`
`c=a&b;`
`d=a|b;`
`printf("%d %d",c, d);` 2

(ii) `void main ()`
`{ int arr []={2, 4, 6, 8, 10};`
`int i=4, *ptr;`
`ptr=arr+4;`
`while (i>=0)`
`{ cout<<* ptr;`
`--ptr; --i; }}` 2

(b) Write a nested loop to print the following pattern:

8 8 8 8

6 6 6

4 4

2

3

3. (a) Declare an array of nested structure to store the following details about the employees of a company:
employee code, employee name, date of birth (dd/mm/yy) and salary. 2
- (b) What operations cannot be performed—
- (i) on a single pointer variable?
- (ii) between two pointer variables? 2
- (c) Write a program that reads a given text file and prints the number of vowels present in it. 3
4. (a) Sort the elements 5, 2, 10, 6, 9, 3 using selection sort. Show the list after each pass. 3
- (b) Write a recursive function to compute x^y , where x and y are integers. 2
- (c) Write a function to add a node at the beginning of a singly linked list of integer values. 3
5. (a) Define Circular Queue. What are its advantages over a Linear Queue? Explain by drawing figures. 3
- (b) Evaluate the following postfix expression. Also show the status of the stack at every step: 2
- $9\ 3\ -2\ 4\ +\ *$
- (c) Compute the number of nodes in a complete Binary Tree of height h . 1

- (d) Show the sequence of nodes in which they are visited in the following Binary Search Tree using Preorder, Inorder and Postorder traversal: 3

