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4 SEM TDC MTH M 1 (A)

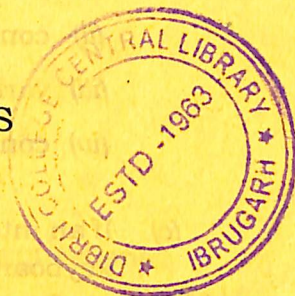
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(May)

MATHEMATICS

(Major)

Course : 401



[A : Computer Programming (C Programming)]

Full Marks : 50

Pass Marks : 20/15

Time : 2½ hours

*The figures in the margin indicate full marks
for the questions*

1. Choose the correct answer :

1×5=5

(a) Which of the following is an invalid variable name in C?

(i) Hello

(ii) Group

(iii) Plot

(iv) Case

(2)

- (b) In C, arithmetic instruction cannot contain
- (i) variables
 - (ii) constants
 - (iii) variable names on right side of =
 - (iv) constants on left side of =

- (c) If an integer is to be entered through the keyboard, which function would you use?

- (i) scanf ();
- (ii) gets ();
- (iii) getche ();
- (iv) getchar ();

- (d) In what sequence the initialization, testing and execution of body is done in a do-while loop?

- (i) Initialization, execution of body, testing
- (ii) Execution of body, initialization, testing
- (iii) Initialization, testing, execution of body
- (iv) None of the above

(3)

- (e) Which of the following array declarations is correct?

- (i) int a (25);
- (ii) int size = 10;
- (iii) int c = {0, 1, 2}
- (iv) int num [5];

2. Answer any *eight* of the following questions :

2×8=16

- (a) Point out the errors if any in the following declaration of variable names in C :

- (i) float, a, b, c;
- (ii) real x, y;
- (iii) int : x;

- (b) What do you mean by keywords in C?

- (c) Write about the characteristics of an algorithm.

- (d) Convert the algebraic expression $\frac{2bx}{c+1} - \frac{y}{5(y+z)}$ into corresponding C expression.

- (e) Evaluate the following expression assuming that k is an integer variable :

$$k = 3/2 * 4 + 3/8 + 3$$

- (f) Write scanf statement to read the following data lists :

(i) 78 B 45

(ii) 123 1.23 45 A

- (g) Write a C program to read the values of the variables a , b and c and print the result of the expression $b^2 - 4ac$.

- (h) The distance between two cities (in km) is input through the keyboard. Write a C program to convert and print this in meters and centimeters.

- (i) Write the syntax of the while loop and draw flowchart for it.

- (j) Write a C program to test whether a given number is even or odd.

- (k) Write a C program to read and print a matrix of order 3×3 .

- (l) Write a C program to print even numbers between 2 and 59.

3. What is flowchart? Write a flowchart to find the largest number among three numbers.

$$1+2=3$$

4. Write a C program to compute simple interest and compound interest.

3

Or

Temperature of a city in centigrade degrees is input through the keyboard. Write a C program to convert this temperature into Fahrenheit degrees.

3

5. Write a C program to evaluate the factorial of a number.

3

Or

Write a C program to generate first 50 Fibonacci numbers

1, 1, 2, 3, 5, 8, 13,

3

6. Write a C program to arrange a one-dimensional array of n numbers in descending order.

4

Or

Write a C program to obtain the transpose of a matrix of order 5×5 .

4

(6)

7. What do you mean by an array in C? Write a C program for reading a one-dimensional array of 20 numbers and calculate the average. 1+3²

Or

Write a C program to find the mean and standard deviation of a one-dimensional array of n numbers.

8. What do you mean by user defined functions in C? Write a C program to find the cube of a number using function prototype. 1+3²

Or

Write a C program to subtract two matrices of orders 4×4 .

9. Write a C program to find the sum of the exponential series up to n terms

$$e^x = 1 + x + \frac{x^2}{2} + \frac{x^3}{6} + \dots$$

Or

Write a C program to multiply two matrices of orders 4×4 .

(7)

10. Write a C program for Newton-Raphson method to calculate the roots of the equation $xe^x - 1 = 0$. 4

Or

Write a C program to compute the roots of the quadratic equation $ax^2 + bx + c = 0$, $a \neq 0$. 4

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