MATH/V/CC/08c

Student's Copy

2023

(CBCS)

(5th Semester)

MATHEMATICS

EIGHTH (C) PAPER

(Computer Programming in FORTRAN)

Full Marks: 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A-OBJECTIVE)

(Marks: 8)

Tick (\checkmark) the correct answer in the brackets provided :

1×8=8

1. In a flowchart, rectangle-shaped box is used for

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- (a) decision ()
- (b) start/end (
- (c) processing ()
- (d) input/output ()
- 2. The valid integer variable constant is
 - (a) -125 ()
 - (b) 125- ()
 - (c) 12.59 ()
 - (d) 79,125 ()

3. The maximum length of the character is

- (a) 159 () (b) 123 ()
- (c) 127 ()
- (d) 120 ()

4. The expression for subscript or index should be

- (a) real ()
- (b) integer ()
- (c) mixed mode ()
- (d) None of the above ()

5. The correct Arithmetic IF statement is

(a) IF (I-K) 10,20,50 ()
(b) IF (I-R) 10,20,30 ()
(c) IF (R-I) 5,10,15 ()
(d) IF (A-B) 50,60 ()

6. The general form of the computed GO TO statement is

- (a) GO TO $(n1, n2, \dots nm), i$ ()
- (b) GO TO (i), n1, n2, n3 ()
- (c) $(n1, n2, \dots, nm), i \text{ GO TO}$ ()
- (d) (i), n1, n2, n3 GO TO ()

7. The correct format of the subroutine is

- (a) SUBROUTINE (argument) name ()
- (b) name (argument) SUBROUTINE ()
- (c) (argument) SUBROUTINE name ()
- (d) SUBROUTINE name (argument) ()
- 8. Which of the following is called specification statement?
 - (a) EQUIVALENCE statement ()

(b) DO statement ()

- (c) DIMENSION statement ()
- (d) Arithmetic IF ()

(SECTION : B-SHORT ANSWERS)

(Marks: 15)

Answer any five questions taking at least one from each Unit :

UNIT-I

- 1. Write the program to find area of triangle.
- 2. Find the value of I in the following expression :

I = J * 3 / 3 + K / 4 + 5 - J * * 3 / 8 (take J = 2, K = 5)

UNIT-II

- 3. Write a short note on computed GO TO statement.
- 4. Write a program for picking largest of three numbers using Logical IF.

UNIT-III

- 5. Write a short note on DIMENSION statement.
- 6. A vector has 10 components. Write a Fortran program that will interchange the odd and even components of the vector.

UNIT-IV

- 7. Write a short note on COMMON statement.
- 8. Write a program for function subprogram to find the factorial of a number.

(SECTION : C-DESCRIPTIVE)

(Marks: 52)

Answer the following :

UNIT-I

- 1. (a) What is algorithm? Write an algorithm to find the sum of digits of five-1+4=5digit numbers.
 - (b) What is flowchart? Write a flowchart to find the largest of three given 1+4=5numbers.
 - 3 (c) Write an algorithm to find the largest of three given numbers.

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 $13 \times 4 = 52$

3×5=15

- 2. (a) Write a flowchart and an algorithm which will read two positive integers and find their LCM. $4+4 \ge 8$
 - (b) Evaluate

assuming that X = 100, Y = -20 and Z = 50.

UNIT—II

3. (a) Suppose that the value of Y is given by the equation

 $Y = x^{5} if x < 3.0572$ $= x^{3} + 3x + 4 if x \ge 30.572$

Write a program using IF-THEN-ELSE statement.

- (b) Write a program of picking largest of three numbers using
 (c) Write a short
- (c) Write a short note on IF-THEN-ELSE statement.

OR

- **4.** (a) Write a program for adding digits of a number using logical IF.
 - (b) Write a program to evaluate the root of a quadratic equation

$$ax^2 + bx + c = 0$$
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(c) Write a program that reads the coefficients A, $B(A \neq 0)$ of the linear equation AX + B = 0 and computes its roots when it is positive and gives appropriate message when it encounters a negative root using Arithmetic IF.

Unit—III

- 5. (a) Suppose $S = 1 + x + x^2 + x^3 + x^k$. Write a program to sum the series using DO loop.
 - (b) Write a program to arrange a given set of numbers in decreasing order using DO loop.
 - (c) Write a short note on DO statement.

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OR

UNIT-IV

(b) Use DO loop to write a program to find the total number of even

6. (a) Write a program to find the sum of two matrices A and B of same order.

7. (a) Use a function subprogram to evaluate the HCF of two numbers M

(b) Write a program to find the trace of an $m \times n$ matrix A.

and N.

integers in a given set of 100 integers. (c) Write a function subprogram to find the factorial of a number. OR 8. (a) Use subprogram and write a program to find LCM of two given numbers. (b) The relationship between the rectangular coordinates (x, y) and the polar coordinates r, θ of a point x = r cos θ, y = r sin θ. Write a subroutine subprogram to convert rectangular coordinates of a point to its polar coordinates. (c) What are the different classifications of functions and subroutines?

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 (take $J = 2, K = 5$)

Unit—II

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4. Write a program for picking largest of three numbers using Logical IF.

Unit—III

- 5. Write a short note on DIMENSION statement.
- 6. A vector has 10 components. Write a Fortran program that will interchange the odd and even components of the vector.

UNIT-IV

- 7. Write a short note on COMMON statement.
- 8. Write a program for function subprogram to find the factorial of a number.

(SECTION : C-DESCRIPTIVE)

(Marks : 52)

Answer the following :

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1. (a)	What is algorithm?	Write an algorithm to find the sum of digits of five- 1+4	=5
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- (b) What is flowchart? Write a flowchart to find the largest of three given 1+4=5 numbers.
- (c) Write an algorithm to find the largest of three given numbers.

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13×4=52

3×5=15

- (a) Write a flowchart and an algorithm which will read two positive integers and find their LCM.
 4+4=8
 - (b) Evaluate

assuming that X = 10.0, Y = -2.0 and Z = 5.0.

Unit—II

3. (a) Suppose that the value of Y is given by the equation

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Write a program using IF-THEN-ELSE statement.

- (b) Write a program of picking largest of three numbers using ELSE-IF-THEN statement. 5
- (c) Write a short note on IF-THEN-ELSE statement.

OR

4. (a) Write a program for adding digits of a number using logical IF.(b) Write a program to evaluate the root of a quadratic equation

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(c) Write a program that reads the coefficients A, $B(A \neq 0)$ of the linear equation AX + B = 0 and computes its roots when it is positive and gives appropriate message when it encounters a negative root using Arithmetic IF.

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- 5. (a) Suppose $S = 1 + x + x^2 + x^3 + x^k$. Write a program to sum the series using DO loop.
 - (b) Write a program to arrange a given set of numbers in decreasing order using DO loop.
 - (c) Write a short note on DO statement.

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OR

6.	(a) (b)	Write a program to find the sum of two matrices A and B of same order. Write a program to find the trace of an $m \times n$ matrix A.	7 6
		UNIT-IV	
7. (a)	Use a function subprogram to evaluate the HCF of two numbers M and N .		
	(b)	Use DO loop to write a program to find the total number of even integers in a given set of 100 integers.	4 3
	(C)	write a function subprogram to find the factorial of a framour	
		OR	
8	. (a)	Use subprogram and write a program to find LCM of two given numbers.	5
	(b)	The relationship between the rectangular coordinates (x, y) and the	

polar coordinates r, θ of a point $x = r \cos \theta$, $y = r \sin \theta$. Write a subroutine subprogram to convert rectangular coordinates of a point to its polar coordinates.

(c) What are the different classifications of functions and subroutines?

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