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(6th Semester)

MATHEMATICS

Paper : MATH-364 (B)

(Computer Programming in FORTRAN)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(Marks : 35)

The figures in the margin indicate full marks for the questions

Answer **five** questions, selecting **one** from each Unit

UNIT—I

1. (a) Write a flowchart to find the largest of three numbers. 3
- (b) What is the final value of J calculated in the following? 2+2=4
- (i) $J = B * B / 2. + B * 4. / A - B + A ** 3$
(A=3.0, B=2.0)
- (ii) $J = K / 2 * 4 + 15 / 4 + K ** 2$ (K=4)

2. (a) Write a FORTRAN program to find the factorial of a positive integer. 4
- (b) Write an algorithm to find the perimeter of a rectangle. 3

UNIT—II

3. (a) Write the general form of DATA statement. What will be the value of A and B from the following statements?
1+3=4
- (i) DATA A,B/25.2,19.8/
- (ii) DATA A,B/2*3.7/
- (b) If I = J = 1; what values the following logical expressions have? 3
- ((I.GT.0).AND.(J.LT.0)).OR.(.NOT.(J.GT.0).AND..NOT.(I.LT.0))
4. (a) Write short notes on any two of the following : 2×2=4
- (i) Complex variable
- (ii) Double-precision statement
- (iii) Logical variable
- (b) Write a program to find the distance between two points (x_1, y_1) and (x_2, y_2) . 3

(3)

UNIT—III

5. (a) Write the general form of IF-THEN-ELSE statement. 2
- (b) N is said to be a prime number if its only divisors are 1 and itself. Write a FORTRAN program using 'DO loop' that reads an integer $N > 2$ and determines if N is a prime by testing if N is divisible by any of the integers 2, 3, ...N/2. 5
6. (a) Write a program to find the sum of digit of a five-digit number using DO loop. 4
- (b) We give below a program to count and print out the number of zeros out of N integers input by the programmer. Find the errors in the program. Indicate whether the errors are 'syntax errors' or 'logical errors'. Also correct the program if possible : 3

```

INTEGER ZEROD, S, D
READ (*,*) N
ZEROD = 0
DO 25 S = 1, N
2 READ (*,*) D
IF (D.NE.0) GOTO 2
ZEROD = ZEROD + 1
WRITE (*,*) ZEROD
END

```

(4)

UNIT—IV

7. (a) Write a program to arrange the numbers in ascending orders. 3
- (b) Write a program to find the product of two matrices. 4
8. (a) Write a program to find the trace of an $m \times n$ matrix. 3
- (b) Write a function subprogram to evaluate : 4
- $$f(x) = 2x^2 - 3x + 4 \quad \text{for } x \leq 2$$
- $$f(x) = 0 \quad \text{for } x > 2$$
- $$f(x) = 2x^2 - 3x + 4 \quad \text{for } x \leq 2$$

UNIT—V

9. Write a function subprogram to find the factorial of n . Also write a main program to call this function and evaluate ${}^n C_r$, where

$${}^n C_r = \frac{n!}{r!(n-r)!} \quad 3+4=7$$

10. (a) Write a subroutine to find the roots of a quadratic equation $ax^2 + bx + c = 0$. 5
- (b) Write a note on COMMON statement in FORTRAN. 2

Subject Code : MATH/VI/12 (b)

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Booklet No. **A**

Date Stamp

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To be filled in by the Candidate

DEGREE 6th Semester
(Arts / Science / Commerce /
.....) Exam., **2017**
Subject
Paper

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To be filled in by the Candidate

DEGREE 6th Semester
(Arts / Science / Commerce /
.....) Exam., **2017**
Roll No.
Regn. No.
Subject
Paper
Descriptive Type
Booklet No. B

INSTRUCTIONS TO CANDIDATES

- 1. The Booklet No. of this script should be quoted in the answer script meant for descriptive type questions and vice versa.
- 2. This paper should be ANSWERED FIRST and submitted within 45 minutes of the commencement of the Examination.
- 3. While answering the questions of this booklet, any cutting, erasing, overwriting or furnishing more than one answer is prohibited. Any rough work, if required, should be done only on the main Answer Book. Instructions given in each question should be followed for answering that question only.

Signature of
Scrutiniser(s)

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Examiner(s)

Signature of
Invigilator(s)

MATH/VI/12 (b)

2 0 1 7

(6th Semester)

MATHEMATICS

Paper : MATH-364 (B)

(Computer Programming in FORTRAN)

(PART : A—OBJECTIVE)

(Marks : 20)

Answer **all** questions

SECTION—A

(Marks : 5)

Each question carries 1 mark

Put a Tick mark against the correct answer in the box provided :

1. A step-by-step procedure to solve a problem is called

(a) flowchart

(b) algorithm

(c) array

(d) loop

(2)

2. The general form of computed GOTO statement is

(a) GOTO n

(b) GOTO(n1,n2,n3,...,nm) i

(c) GOTO(n1,n2,n3,...,nm), i

(d) GOTO i, (n1,n2,n3,...,nm)

3. Which one of the following is valid FORTRAN real variable name?

(a) GOTO

(b) ABACUSA

(c) ABRAHAM

(d) AIZAWL

(3)

4. Choose the invalid FORTRAN statement :

(a) IF(N.LT.0) Y=2.3

(b) DO 10 J=1.13

(c) IF (D) 11,22,33

(d) WRITE (*,*)"123=X"

5. Which one of the following is invalid real constant in exponent form?

(a) 625E10

(b) 567.0E11

(c) 123.E+8

(d) 234.E+07

(4)

SECTION—B

(Marks : 15)

Each question carries 3 marks

1. Convert the following algebraic expression into FORTRAN expression :

$$\sqrt{\sin \frac{3ax - 3}{c^2}}$$

(5)

2. Trace through the following logical expressions step-by-step, illustrating the hierarchy of operations. For each problem, assume that $X = -5.1$, $Y = 3$, $Z = 10.0$:

$(X.GE.Z.AND..NOT.((Z*Y.LE.X).OR..NOT.(X.EQ.Y)))$

(6)

3. Write the general form of arithmetic IF statement.

(7)

4. Write any two FORTRAN library functions with suitable examples.

(8)

5. Write the arithmetic statement function to find the area of a circle.
