

2016

(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) What do you mean by an algorithm?
Write an algorithm to find the HCF of
two positive integers. 1+3=4
- (b) Pick the incorrect real variable names
from the following, stating reasons : 3
- | | | |
|--------------|--------------|--------------|
| (i) CONSTANT | (ii) VARIAB | (iii) NUMBER |
| (iv) INKPOT | (v) ROL.NO | (vi) RS-PS |
| (vii) LAXME | (viii) SQRTX | (ix) LIMITED |
| (x) KASAUTI | (xi) IXON | (xii) BSC |

2. (a) Which of the following FORTRAN constants are of integer types, real types or not valid (with reasons)? 4
- | | | |
|-------------|--------------|---------------|
| (i) 4505 | (ii) -8213 | (iii) 110.52 |
| (iv) +9323 | (v) 1,00,000 | (vi) 9E2 |
| (vii) 7.2.4 | (viii) 80- | (ix) 1.01E-02 |
- (b) Write a flowchart to find the largest of three integers. 3

UNIT—II

3. (a) Write the general form of DATA statement. Write the DATA statement which will assign
A = 3.5, B = 1.23, C = 34.2 and I = 324 3
- (b) If I = 2, J = 3, K = 6, what values the following logical expressions have? 2+2=4
- (i) NOT.I.GT.J.AND..NOT.I J.LE.K
- (ii) I.GT.J.AND.(I.LE.K.OR.I J.LE.K)
4. (a) Consider the following program segment :
- ```
LOGICAL A,B
Y=12.6
A=112.GT.Y
B=Y.GE.12.6
```
- What will be the final value of the logical variables A and B? 1+1=2

( 3 )

- (b) Consider the following program segment :

```
COMPLEX A,B
```

```
A=(3.5,1.2)
```

```
B=3 A+A
```

What will be the final value of B? 3

- (c) What will be the output of the following program? 2

```
DATA I,J,K/34,21,12/
```

```
WRITE(,11) I,J,K
```

```
11 FORMAT(1X, I4, I4 / 1X, I4)
```

#### UNIT—III

5. (a) Write the general form of arithmetic IF statement. 1

- (b) Write a program segment using arithmetic IF statement to do the following : 2

If a b, compute  $\sqrt{a^2 + b^2}$  and store the result in W

- (c) 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. 4

( 4 )

6. (a) Write a program to find the sum of digits of an integer. 4

- (b) What will be the final value of NNNN in the following program? 3

```
NNNN = 10
```

```
KKKK = 20
```

```
IF(2 NNNN.LE.KKKK)GO TO 10
```

```
NNNN = NNNN + KKKK
```

```
GO TO 20
```

```
10 NNNN = KKKK+5
```

```
20 NNNN = NNNN KKKK
```

#### UNIT—IV

7. (a) Which of the following are invalid subscripted variables? State the reasons : 3

(i) B(J) (ii) A(2J) (iii) JINK(I,J)

(iv) AT(J-2, K+2) (v) INK(I.J) (vi) J(-5)

(vii) KAMB(2 J, 3, I-2) (viii) TEMP(I(J))

- (b) Write a program to arrange numbers in decending orders. 4

8. (a) Which of the following are invalid DIMENSION statements? State the reasons : 3

(i) DIMENSION BAL(10,10)

(ii) DIMENSION A(M,N), B(K)

( 5 )

(iii) DIMENSION, BAL(10,10), NUMR((5)

(iv) DIMENSION A(20), C(20)

(v) DIMENSION A(20), C(20).

(vi) COST(5,10,6)

- (b) Use a DO loop to write a program which will find the total number of even integers in a given set of 500 integers. 4

#### UNIT—V

9. Write a FUNCTION subprogram which calculates the area of a triangle in terms of its three sides a, b, c. Also write a main program to use this subprogram. Can the same thing be done by using an arithmetic statement function too? If so, how?  $3+2+2=7$
10. Write a subroutine to solve the quadratic equation  $ax^2 + bx + c = 0$ . Also write the main program for this subroutine.  $4+3=7$

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**Subject Code : MATH/VI/12 (b)**

**Booklet No. A**

Date Stamp .....

.....

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DEGREE 6th Semester  
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**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, over-writing 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.**

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Roll No. ....

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Subject .....

Paper .....

Descriptive Type

Booklet No. B .....

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**MATH/VI/12 (b)**

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( 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.** In a flowchart, a rectangle with rounded sides is used for

(a) input/output ☐

(b) processing ☐

(c) decision ☐

(d) start/end ☐

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( 2 )

2. The final value of B in the following program is

```
B = 25.1
B = B / 2
KB = B
B = KB
B = (B + KB)/10
```

(a) 10 ☐

(b) 10. ☐

(c) 5 ☐

(d) 5. ☐

3. Which one is invalid DO statement?

(a) DO 34 K = 1, 20 ☐

(b) DO 22 I = 1, M, N + 3 ☐

(c) DO 65 KAL = MIN, MAX, JACK ☐

(d) DO 35 I = 2.10 ☐

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( 3 )

4. Consider the following program segment :

```
 DO 20 I = 1, 10
 DO 10 J = 1, 20
 READ(,) B(I,J)
20 CONTINUE
10 CONTINUE
```

This can be written using implied DO notation as

(a) READ( , ) (B(I,J),J=1,20),I=1,10 ☐

(b) READ( , ) (B(I,J),I=1,20),J=1,10 ☐

(c) READ( , ) (B(I,J),I=1,10),J=1,20 ☐

(d) READ( , ) (B(I,J),J=1,10),I=1,20 ☐

5. If  $I = 4$ ,  $J = 5$ ,  $A = 4.5$  and  $B = 2.5$ , then the value of  $A \cdot I/J + A \cdot I \cdot B \cdot J$  is

(a) 30 ☐

(b) 30.5 ☐

(c) 30. ☐

(d) 30.51 ☐

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( 4 )

SECTION—B

( Marks : 15 )

*Each question carries 3 marks*

1. Convert the following algebraic expression into FORTRAN expressions :

$$a \frac{\frac{x}{y} - 6}{\frac{x^2}{y^2}}$$

**( 5 )**

- 2.** Write any two library functions in FORTRAN with simple illustration.

( 6 )

3. Write the general form of computed GOTO statement.

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( 7 )

4. Write a FORTRAN program to evaluate the following function :

$$f(x) = \begin{cases} \sin x, & \text{if } x \leq 1 \\ e^{x^2}, & \text{if } x > 1 \end{cases}$$

( 8 )

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

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