RAN-2103000206030013

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T. Y. B. Sc. (Mathematics) (Sem. - VI) Examination September - 2023

Elective Generic (6002)

Computer Oriented Numerical Methods - II : Paper - 6002 - (E.G)

Time: 2 Hours] **[Total Marks: 50**

સૂચના : / Instructions

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the details of ☛ signs on your answer book

Name of the Examination:

☛ **T. Y. B. Sc. (Mathematics) (Sem. - VI)**

Name of the Subject :

☛ **Elective Generic (6002) - Computer Oriented Numerical Methods - II : Paper - 6002 - (E.G)**

Subject Code No.: **2103000206030013**

Seat No.:

Student's Signature

(2) All questions are compulsory.

(3) Figures to the right indicate marks of the questions.

(4) Follow usual notations.

Q. 1. Answer the following questions. **(10)**

(i) Give reason for invalidity.

(a) IF (X.LT.Y) THEN

A = B – 3

P = Q * 4

(b) IF (M – R) / (K – P) 7,77,777

(ii) Classify Valid and Invalid following statement :

(a) DO 100 A = 1,10,3

(b) DO 20 J = 2,M,N+3

(c) GO TO 33

(d) GO TO , 35

(iii) (a) Write the effect of FORMAT : 1H0

(b) If $A = \begin{bmatrix} 1 & 2 & -3 & 4 & 5 \\ -6 & 7 & 8 & 9 & 0 \\ 1 & 2 & -3 & 0 & 4 \end{bmatrix}$ then write multiple subscripts of A(3,2), A(l,2), A(2,1), A(2,3).

(iv) Write general form of Logical IF statement.

(v) (a) Find value of K from DO 16 K = 1,16,3

(b) Find output of following numbers whose format are given,

Number	Format
786	I_4

Q. 2. Answer the following. (Any two) **(10)**

(a) Which are the relational operators available in FORTRAN? What do you mean by the logical expression in FORTRAN? State reasons for invalidity of the following:

(i) 4.5 GT B

(ii) M = K

(iii) (A + C) .GN. (B + D)

(iv) A > 9

(v) M ≠ J

(b) Write a program to find roots of equation $ax^2 + bx + c = 0$; $a, b, c \neq 0$.

(c) Assume that N = 10, J = 5 then what will be the final value of N after each of following statement :

(i) IF (3*N.LT.10) N = N + 2, N = N + 3

(ii) IF (4*N – 2*J) 10, 20, 30

10 N = J

20 N = N + J

30 N = N – J

(iii) IF (2*N.EQ.J) N = N + 1, N = N + 2

(iv) IF (N.GT.J) GO TO 10

N = N + 1

GO TO 20

10 N = J

20 N = N + J

Q. 3. Answer the following. (Any two) **(10)**

(a) Explain the rules for Nested DO loops.

(b) Write a program to find the sum of digits of a given number using logical IF and GO TO statement.

(c) What will be printed by the following program segments :

(i)
```
      I = 0
   DO 10 J = 5, –1, 1
      I = I + J
10 CONTINUE
   PRINT *, I
```

(ii)
```
   DO 20, I = 1, 5, 2
    DO 10, J = 2, 4
    PRINT * I * J
10 CONTINUE
20 CONTINUE
```

Q. 4. Answer the following. (Any two) **(10)**

(a) If Poisson function $P(k)$ is given by $P(k) = \frac{e^{-a} a^k}{k!}$, then write a program to find values of $P(k)$ for integral values of k from 0 to 15.

(b) Write a program to solve the equation $x^2 - 3 = 0$ by Bisection method.

(c) Mention the order in which the input values are assigned to A(I, J) by the following input statement:

(i)
```
DIMENSION A(10,5)
READ*, ((A(I, J), I = 1, 10), J = 1, 5)
```

(ii)
```
DIMENSION A(10, 10)
DO 20 J = 1, 4
DO 30 I = 1, 3
READ*, A(I, J)
30 CONTINUE
20 CONTINUE
```

Q. 5. Answer the following. (Any two) **(10)**

(a) Write a program to calculate $\int_1^4 \frac{1}{1+x^2}\,dx$ by Simpson's $\frac{3}{8}$ rule.

(b) (i) READ 30 X, Y
30 FORMAT ($E_{8.2}$, $E_{10.2}$)
Data: 1.25, 8.42
What is read by READ Statement?

(ii) Find output of the following :
PRINT 25 A, B, C
25 FORMAT (1X, $F_{7.4}$, $F_{6.4}$, $F_{8.6}$)
Data: –235.6237, .6237, –.001263

(c) Explain the DIMENSION statement in FORTRAN.

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