RAN-2003000205030012

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## T.Y.B.Sc. (Mathematics) (Sem. V) Examination October - 2023

## Computer Oriented Numerical Methods - I (Elective Generic)

## Paper : 5002

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

**સૂચના : / Instructions**

(૧) **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. V)**

Name of the Subject :

☛ **Computer Oriented Numerical Methods - I (Elective Generic) : Paper : 5002**

Subject Code No.: **2003000205030012**

Seat No.:

Student's Signature

(2) All questions are compulsory.

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

(4) Follow usual notations.

**Que. l Answer the following questions. (Any Five)** **(10)**

1. Define : Compiler in FORTRAN .

2. Classify into real/integer variable name.
   (i) LENGTH (ii) AMOUNT
   (iii) SUM (iv) RATE

3. Explain the reason for the invalidity of the type declaration.
   (i) REAL BIG, FIRST.
   (ii) INTEGER, ROLLNO,EX, AMOUNT

4. Classify into valid and invalid of the following variable name.
   (i) IN-PUT (ii) NUMBER
   (iii) MRX (iv) HELLO

5. Classify into real/integer constants.

   (i) 1234 (ii) 392.05

   (iii) 52.5E07 (iv) –234

6. Translate $M = e^{up} + COS39°$ into FORTRAN expression.

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

1. Explain the components of computer and explain their function.
2. Draw a flow chart to find sum 1 + 2 + 3 + 4 + ..... + *n*.
3. Draw a flow chart to find sum of the series

$$1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + .....+ \frac{x^{15}}{15!}$$

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

1. Mention the errors in the FORTRAM translations written on the right side of the arrow for the expressions written on the left side and correct them.

   (i) $acosx + bsinx^2 \rightarrow ACOSX + BSINX ** 2.$

   (ii) $\frac{1}{2}mv^2 + mgh \rightarrow \frac{1}{2M} * V * V + MG * H$

2. Draw a flow chart to generate all Fibonacci numbers up to 100.
3. Explain the Fractional part of real constant with illustrations.

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

1. Explain the mode of Arithmetic statement rules with two illustrations.
2. What is the final value of *A* and *B* in the following?

   $I = 7$

   $J = 6$

   $A = J/I$

   $B = I/J$

   $I = A + A * J/I * 5 + B$

   $A = I$

   $B = A/I + I * A$

3. What is the value of $K$ in the following arithmetic statements?

   (i) $K = B/2 + B * 4/A - B + A ** 4$ $(A = 2.5, B = 4.0)$

   (ii) $K = J/2 * 4 + B/2 + B * 5 - 3/8 * J + J ** 3$ $(J = 3, B = 3.0)$

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

1. Give FORTRAN equivalent for the given expressions.

   (i) $3.5\ log\ \log_{10} x + cos39° + |x^2 - y^2| + 2\sqrt{xy}$

   (ii) $\frac{\alpha}{\sqrt{\alpha^2 + \omega^2}} cos\ (\omega t + \varphi)$

2. Given $(x, y)$ co-ordinates of points. Write a program to convert it in polar co-ordinate $(r, \theta)$ , Where $r = \sqrt{x^2 + y^2}$ ; $\theta = tan^{-1}\left(\frac{y}{x}\right)$.

3. Explain Hierarchy of operation in expression with illustration.