5/4 SY

Shri S. H. Kelkar College of Arts, Commerce and Science, Devgad

S.Y.BSC SEMISTER-IV Examination-March 2023

Exam Department

Course: Mathematics Paper-III **Course Code: USMT403**

Maximum marks: 75 **Duration: 2 ½Hrs**

Instructions:

All questions are compulsory and carry equal marks

Figures to the right indicate full marks

Q.1 Attempt any four of the following **20**

a) What are rounding and chopping error?
b) What is relative, absolute and percentage error?
c) Explain false position Method.
d) Find the root of the equation $2e^x sinx = 3$ using false position method and correct up to three decimal places
e) compute two iterations for function $f(x) = x^3 - 5x + 1 = 0$ using secant method in which real roots of the equation f(x) lies in the interval (0, 1)

Q.2 Attempt any four of the following **20**

a) What is interpolation? Explain it briefly
b) Given

t (s)	0	10	15	20	22.5	30
V (m/s)	0	227.04	362.78	517.35	607.07	901.67

Find V (16) using Lagrange's Interpolation?
c) Obtain relationship between shift operator and forward difference operator.
d) Explain linear curve fitting?
e) Find the solution of equation $\frac{1}{x}$ using Simpsons 1/3rd rule

Q.3 Attempt any four of the following **20**

a) What are linear system of equation?
b) Explain Rutishauser Method for arbitrary matrices
c) Solve the equation $2x + 3y + z = 9; x + 2y + 3z = 6; 3x + y + 2z = 8$ by using LU decomposition method
d) Explain Jacobi method.
e) Explain Gauss-Seidal method

Q.4 Attempt any three of the following **15**

a) Explain bisection method
b) State Weierstras theorem
c) What is backward difference operator? State Newton's Backward difference formula
d) Find all Eigen values of matrix $A = \begin{bmatrix} 4 & 3 \\ 1 & 2 \end{bmatrix}$ using Rutishauser Method