

Roll No.

Y – 3178(A)
M.A./M.Sc. (Second Semester) (SPECIAL) EXAMINATION, August 2021
(SECOND CHANCE)
MATHEMATICS
Paper–204
(Numerical Methods)
Time : Three Hours

Maximum Marks : 85

Minimum Pass Marks : 29

Note : Attempt *all* questions.

1. Perform four iterations of the Newton-Raphson method to obtain the approximate value of $(18)^{1/3}$. 17

2. Solve the system of equations : 17

$$x_1 + x_2 + x_3 = 6.$$

3. Obtain the cubic spline approximation for the function given in the tabular form : 17

$$\begin{array}{l} x \quad : \quad 0 \quad 1 \quad 2 \quad 3 \\ f(x) : \quad 1 \quad 2 \quad 33 \quad 244 \end{array}$$

and $M(0) = 0$, $M(3) = 0$.

4. Establish the Gauss-Legendre three point formula for numerical integration. 17

5. Find the three Taylor series solution for the third order Blasius equation :

$$W''' + WW'' = 0, W(0) = 0, W'(0) = 0$$

$$W''(0) = 1$$

Find the bound on the error for $t \in [0, 0.2.]$ 17

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