

Unique Paper Code : 42357618 Date: 15/04/2024

Name of Paper : DSE – Numerical Method (Class Test)

Name of Course : B.Sc. (Prog.) Physical Sciences (with Chemistry)

Semester : VI

Duration : 1 hours

Maximum Marks : 20 Marks

Attempt any four question. All questions carry equal marks.

Q. 1. Compute the real root of the equation $x^3 = 7$ correct to four decimal places using Newton Rapson's method.

Q. 2 Perform four iterations of the Bisection method to obtain the smallest positive root of the equation $f(x) = x^3 + 2x - 2 = 0$.

Q.3 Solve the following system of equations

$$\begin{aligned} 6x + 2y + 2z &= 8 \\ 6x + 2y + z &= 4 \\ x + 2y - z &= 12 \end{aligned}$$

using Gauss Jordan Method.

Q. 4 Consider the following table:

x	0.1	0.2	0.3	0.4	0.5
$f(x)$	1.40	1.56	1.76	2.00	2.28

Use Newton divided difference formula to calculate the interpolating polynomial and give an estimate for $f(0.25)$.

Q.5 Show that

(i) $\mu = \left[1 + \frac{\delta^2}{4}\right]^{1/2}$

(ii) $\delta = E^{1/2} - E^{-1/2}$

[Signature]

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