

**Subject : Numerical Methods**

Day : Monday  
Date : 13/06/2016



Time : 02.00 PM TO 05.00 PM  
Max Marks : 80 Total Pages : 2

**N.B.:**

- 1) Attempt **ANY FIVE** questions from Section – I and **ANY TWO** questions from Section – II.
- 2) Answers to both the sections should be written in the **SAME** answer book.
- 3) Use of simple calculators and logarithmic table is **ALLOWED**.
- 4) Figures to the right indicate **FULL** marks.

**SECTION – I**

**Q.1** Solve the following system of linear equations using Gauss Elimination Method: **[10]**

$$\begin{aligned} 3x - y + z &= 6 \\ 4x - y + 2z &= 7 \\ 2x - y + z &= 4 \end{aligned}$$

**Q.2** Solve the following system of equations by the Gauss Seidal Method. **[10]**

$$\begin{aligned} 5x + 2y + z &= 12 \\ x + 4y + 2z &= 15 \\ x + 2y + 5z &= 20 \end{aligned}$$

**Q.3** For the given data: **[10]**

X	110	130	160	180
Y	10.8	8.1	5.5	4.8

Using Lagrange's Interpolation formula, find  $y$  when  $x = 140$ .

**Q.4** Fit the curve  $y = a + bx + cx^2$  which fits the following data: **[10]**

X	0	1	2	3	4
Y	1	1.8	1.3	2.5	2.3

Estimate  $y$  when  $x = 3.5$ .

**Q.5** Convert the following: **[10]**

- a)  $6751_8 = ?_2$
- b)  $11010001101_2 = ?_{16}$

**Q.6** Explain different types of errors in numerical computing. **[10]**

**P.T.O.**

**Q.7** Write short notes on **ANY TWO** of the following: [10]

- a) Numerical Computing
- b) Accuracy and Precision
- c) Interpolation Techniques

**SECTION – II**

**Q.8** Apply inverse interpolation formula to find value of  $x$  when  $y = 0$ . [15]

X	30	34	38	42
Y	-30	-13	3	18

**Q.9** Find the derivative of the following using the differentiation from first principles method: [15]

a)  $\frac{1}{x}$

b)  $\frac{1}{3-2x}$

c)  $\tan^2 x$

**Q.10** Evaluate the following integral. [15]

a)  $\int (x^3 + 4x + 2)^5 (3x^2 + 4) dx$

b)  $\int \frac{3x+5}{(3x^2+10x+2)^{2/3}} dx$

c)  $\int \frac{\sin x}{(1+\cos x)^3} dx$

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