

B.Sc. (Information Technology) - 2nd Semester (old sylb 2017-18)

(2721)

Paper-V: Numerical Methods & Statistical Techniques

Time Allowed: 2 hrs.

Max. Marks: 75

Note: There are EIGHT questions of equal marks. Candidates are required to attempt any FOUR questions.

1 a)	Find real root of equation $x^3 - x - 1 = 0$ using bisection method correct to three decimal places.												
b)	If $f = x^2 y^3 z^{10}$ find approximate value of f when $x=2, y=3, z=1$ and error produced in $x=-0.01, y=0.01, z=-0.02$ respectively.												
2 a)	Find iterative formula for $\frac{1}{\sqrt{N}}$ Hence evaluate $\frac{1}{\sqrt{14}}$ using newton Raphson method correct to three decimal places.												
b)	Find a real root of equation $x^3 - 2x - 5 = 0$ by Regula false method correct to three decimal places												
3 a)	Use newton backward formula. Fit a cubic polynomial then find $f(4)$												
	<table border="1"> <tbody> <tr> <td>X</td> <td>0</td> <td>1</td> <td>2</td> <td>3</td> </tr> <tr> <td>Y</td> <td>1</td> <td>0</td> <td>1</td> <td>10</td> </tr> </tbody> </table>	X	0	1	2	3	Y	1	0	1	10		
X	0	1	2	3									
Y	1	0	1	10									
b)	Using Lagrange interpolation formula. Evaluate $f(10)$												
	<table border="1"> <tbody> <tr> <td>X</td> <td>5</td> <td>6</td> <td>9</td> <td>11</td> </tr> <tr> <td>Y</td> <td>12</td> <td>13</td> <td>14</td> <td>16</td> </tr> </tbody> </table>	X	5	6	9	11	Y	12	13	14	16		
X	5	6	9	11									
Y	12	13	14	16									
4 a)	Use Simpson $\frac{1}{3}$ rule $I = \int_0^1 \frac{dx}{1+x^2}$ take $n=6$												
b)	Use trapezoidal rule. To compute $\int_0^1 \frac{dx}{1+x}$ take $n=6$												
5 a)	Using newton divided difference formula. Find $f(9)$												
	<table border="1"> <tbody> <tr> <td>X</td> <td>2</td> <td>4</td> <td>9</td> <td>10</td> </tr> <tr> <td>Y</td> <td>4</td> <td>56</td> <td>711</td> <td>980</td> </tr> </tbody> </table>	X	2	4	9	10	Y	4	56	711	980		
X	2	4	9	10									
Y	4	56	711	980									
b)	Using method of curve fitting. Fit a straight line to following data												
	<table border="1"> <tbody> <tr> <td>X</td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td>Y</td> <td>14</td> <td>27</td> <td>40</td> <td>55</td> <td>68</td> </tr> </tbody> </table>	X	1	2	3	4	5	Y	14	27	40	55	68
X	1	2	3	4	5								
Y	14	27	40	55	68								

Contd....P/2

(2)

6 a)	Using newton forward difference formula. Fit a polynomial						
X	1	2	3	4	5		
y	14	27	40	55	68		
b)	Find median for the following data.						
X	0-5	5-10	10-15	15-20	20-25	25-30	30-35
7 a)							
Find coefficient of variation for the following data							
X	10	15	20	25	30	35	
F	10	8	9	10	15	18	
b)	Find mean for the following data.						
X	20	25	30	35	40	45	50
F	3	5	8	14	10	6	4
8 a)	Find mean deviation from mean for the following data.						
X	60	62	64	66	68	70	
F	10	14	18	24	20	14	
b)	Find standard deviation for the following data.						
X	0-5	5-10	10-15	15-20	20-25	25-30	30-35
F	4	6	10	16	12	8	4

6635(2721)100