**Assignment : Probability and Numerical Methods**

**Subject Code: MATH2202**

**Module-I**

1. Use **Bisection** Method to solve the following equations:
2. , correct 3 significant figures. [Ans: 1.56]
3. correct upto 2 decimal places. [Ans: 0.57]
4. Use **Regula-Falsi** Method to solve the following equations:
5. correct upto 3 decimal places. [Ans: 3.789]
6.  correct upto 4 significant figures. [Ans: 1.571]
7. Use **Newton-Rapshson** Method to solve the following equations:

(a) , correct upto 4 significant figures. [Ans: 1.557]

(b) Evaluate  correct upto 5 significant figures.

1. Solve the following system of linear equations by **Gauss Elimination** method:
2.  (b) 

[Ans: x=181/71, y=89/71, z=188/71] [Ans: x=1, y=1, z=1]

1. Solve the following system of linear equations by **Gauss- Seidel** Method:
2.  correct upto 2 decimal places. 
3.  correct upto 3 decimal places. 
4. Solve the following system of linear equations by **LU-Factorization Method** :
5.  (b) 

[Ans: x=1/4, y=3/4, z=1/2] [Ans: x=3, y=2, z=-1]

7. Find the **missing term** from the table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 | 4 |
| Y | 1 | 3 | 9 | -- | 81 |

[Ans. 31]

8. Find **missing terms** from the following table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| y=f(x) | 7 | -- | 13 | 22 | -- | 52 |

[Ans. f(1)=8, f(4)=35]

9. Find from the following table

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| x | 0.10 | 0.15 | 0.20 | 0.25 | 0.30 |
| y= | 0.1003 | 0.1511 | 0.2027 | 0.2553 | 0.3093 |

[Ans.]

11. Write down the interpolating polynomial expression using the following data and hence find f(0.5)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | -1 | 0 | 1 | 2 |
| y=f(x) | 1 | 1 | 1 | -3 |

[Ans. ]

12. Find the **Lagrange interpolating** polynomial of degree 2 approximating the function defined by the tabular values. Hence find .

|  |  |  |  |
| --- | --- | --- | --- |
|  | 2 | 2.5 | 3.0 |
|  | 0.69315 | 0.91629 | 1.09861 |

. [Ans. , =0.9941164]

13. Evaluate using **Trapezoidal and Simpson’s 1/3 rule** for n=6.

[Ans. 0.765496, 0.777532]

14. Find from the table, the area under the curve & the x-axis from x=7.47 to x=7.52

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| x | 7.47 | 7.48 | 7.49 | 7.50 | 7.51 | 7.52 |
| f(x) | 1.93 | 1.95 | 1.98 | 2.01 | 2.03 | 2.06 |

[Ans. 0.0996]

15. Evaluate taking n=8 by using suitable numerical method.

[Ans. ]

17. Use **Euler’s method** to compute & take .

[Ans. ]

18. Find by **Modified Euler’s method** for take .2.

[Ans. ]

19. Use **RK method** to find and for by taking h=0.5.

[Ans. y(0.5)=1.357, y(1)=1.584]