B.Sc. DEGREE EXAMINATION,NOVEMBER 2019
I Year II Semester
Allied Mathematics - II

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Show that a root of $3x - cosx - 1$ lies between 0 and $\frac{\pi}{2}$.
2. Define algebraic and transcendental equation.
3. Prove that $\triangle = E - 1$.
4. Write down the Newton's backward interpolation formula.
5. Define second divided difference of $f(x)$.
6. Write any two properties of divided difference.
7. Write the second derivative of Newton's forward difference formula.
8. Evaluate $\int_{-3}^{3} x^4 \, dx$,by using Simpson's one-third rule.
9. Find $y(.01)$, given $y' = -y,\ y(0) = 1$ by using Euler's method.
10. Write Modified Euler's formula for solving $y' = f(x, y), y(x_0) = y_0$.
11. Write the formula for Bisection method.
12. What is inverse interpolation?

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Using Bisection method, find the root of $x^3 - x - 1 = 0$ correct to two decimal places.
14. Find the cubic equation from the following data.

x:	3	4	5	6
y:	6	24	60	120

15. Using Lagrange's formula, find $y(9.5)$ from the following data.

x	7	8	9	10
y	3	1	1	9

16. Evaluate $\int_0^6 \frac{1}{1+x} dx$,by using Trapezoidal rule

17. Solve $\frac{dy}{dx} = 1 - y,\ y(0) = 0$ for $x = 0.1$ by using Modified Euler's method.
18. Using Lagrange's inverse interpolation,find the age corrrresponding to the annuity value 13.6 given the following table

Age(x)	30	35	40	45	50
Annuity Value	15.9	14.9	14.1	13.3	12.5

19. Find the positive root of $2x^3 - 3x - 6 = 0$ by Newton-Raphson method correct to three decimal places.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. Solve $e^x - 3x = 0$ by the method of iteration correct to four decimal places..
21. From the following data ,find y at $x = 43$.

x	40	50	60	70	80	90
y	184	204	226	250	276	304

22. Using Newton's divided difference formula,find the value of $f(8)$ from the following data.

x	*4*	*5*	*7*	*10*	*11*	*13*
f(x)	*48*	*100*	*294*	*900*	*1210*	*2028*

23. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 56$ from the following data.

x	50	51	52	53	54	55	56
y	3.6840	3.7084	3.7325	3.7563	3.7798	3.8030	3.8259

24. Using Runge-Kutta method of fourth order find $y(0.2)$ from $y' = y + x, y(0) = 1\ (take\ h = 0.1)$.

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