B.C.A DEGREE EXAMINATION,APRIL 2020
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. Write for the Newton-Raphson method formula.
2. What is the order of convergence of the Newton-Raphson method?
3. State Lagrange's interpolation formula.
4. What do you mean by inverse interpolation?
5. What is the order of error in Trapezoidal rule and Simpson's rule?
6. Write the formula to find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x=x_0$, using Newton's forward difference formula.
7. A random variable X has the following probability function. Find the value of k.

x	0	1	2	3	4	5	6	7
$p(x)$	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2+k$

8. What is the mathematical expectation of the sum of the points on rolling two dice.
9. Define correlation coefficient.
10. Write any two properties of correlation coefficient.
11. Write Simpson's three eighth rule.
12. Let X be a random variable such that $P(X=1)=0.3$ and $P(X=2)=0.2$. Find $P(X=0)$., when x taker the values 0,1,2.

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

Answer any **FIVE** questions

13. Find the real positive root of $3x-cosx-1=0$ by Newton-Raphson method.
14. From the data given below, find the value of x when $y = 13.5$

x :	93	96.2	100	104.2	108.7
y :	11.38	12.8	14.7	17.07	19.91

15. The population of a certain town in the following table. Find the rate of growth of the population in 1961.

Year x	1931	1941	1951	1961	1971
Population y	40.62	60.80	79.95	103.56	132.65

16. The marks obtained by a large group of students in a final examination in mathematics has mean 58 and standard deviation of 8.5. Assuming that these marks are approximately normally distributed, what percent of students can be expected to have obtained marks from 60 to 69, both inclusive?

17. Find the line of regression of $\mathbf{y}$ on $\mathbf{x}$.

$\mathbf{x}$	1	2	3	4	5	8	10
$\mathbf{y}$	9	8	10	12	14	16	15

18. Solve the following system of equations by Gauss elimination method.
$\mathbf{2x+3y-z=5}$, $\mathbf{4x+4y-3z=3}$, $\mathbf{2x-3y+2z=2}$.

19. Three urns contain respectively 3 green and 2 white balls, 5 green and 6 white, 2 green and 4 white balls. One ball is drawn from each urn. Find the expected number of white balls drown out.

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

Answer any **THREE** questions

20. Solve the following system of equations by using Gauss-Seidel method of iteration
$\mathbf{8x-3y}+2\mathbf{z}=20$, $4\mathbf{x}+11\mathbf{y-z}=33$ and $\mathbf{6x}+3\mathbf{y}+12\mathbf{z}=35$

21. Find the equation of the curve $\mathbf{f}(\mathbf{x})$ which passes through the points $(\mathbf{4}, -43)$, $(\mathbf{7}, 83)$, $(9, 327)$ and $(\mathbf{12}, 1053)$. Hence find f(10).

22. Evaluate $\int_0^{\mathbf{1}} \frac{\mathbf{d}x}{\mathbf{1+x}}$ using (i) Trapezoidal rule, (ii) Simpson's rule, and (iii) Simpson's three eighth rule. Take $\mathbf{h}=\frac{\mathbf{1}}{\mathbf{6}}$ for all the cases.

23. Ten coins are tossed simultaneously. Find the probability of getting (i) at least seven heads, (ii) exactly seven heads, and (iii) at most seven heads.

24. Find the coefficient of correlation between X and Y from the following data.

$\mathbf{X}$	10	14	15	28	35	48
$\mathbf{Y}$	74	61	50	54	43	26

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