

END TERM EXAMINATION

FOURTH SEMESTER [BCA] APRIL - MAY 2019

Paper Code: BCA-202

Subject: Mathematics-IV
Maximum Marks: 75

Time: 3 Hours

Note: Attempt five questions in all including Q no. 1 which is compulsory. Select one question from each unit.

[-2-]

- Q5 (a) The marks of 1000 BCA students in a college are found to be normally distributed with mean 70 and var 25. Find number of students whose marks will be between (i) 60 and 75 (ii) more than 75. (6)
- (b) A and B throw a die for a prize of Rs. 11, which is to be won by the player who first throws 6. If A has the first throw, what is the A's expectation. (6.5)

UNIT-III

- Q6 (a) From the following table, find the number of students who obtained (6.5)

	30-40	40-50	50-60	60-70	70-80
Marks	31	42	51	35	31
No. of students	31	42	51	35	31

- (b) Find the polynomial of the lowest possible degree which takes the value 3, 12, 15, -21. When the arguments (x) are 3, 2, 1, -1 respectively. (6.5)

OR

- Q7 (a) Find the real roots of the equation $x \log_{10} x = 1.2$ by N-R up to 4 iterations. (6.5)
- (b) Evaluate by bisection method of $x = (29)^{\frac{1}{3}}$. (6)

UNIT-IV

- Q8 (a) Solve the following equations by Gauss Elimination method (5.5)
- $$2x_1 + x_2 + 4x_3 = 12; \quad 8x_1 - 3x_2 + 2x_3 = 23; \quad 4x_1 + 11x_2 - x_3 = 33$$
- (b) A river is 80 feet wide. The depth (d in feet) of the river at a distance x from one bank is given by the following table. (7)

X	0	10	20	30	40	50	60	70	80
D	0	4	7	9	12	15	14	8	3

Find approximately the area of the cross section of the river using Trapezoidal and Simpson $\frac{1}{3}$ rule.

- Q1 Attempt any five of the following questions:- (5x5=25)

- (a) If $C(15, 3r) = C(15, r+3)$, find r.
- (b) In how many ways can 50 different pearls be arranged to form necklace?
- (c) Evaluate: $\Delta^2 x^3$, where Δ forward operator.
- (d) Find the $\text{Var}(3x+9y)$ such that $\sigma_x^2 (\text{Var of } x = 3)$ and $\sigma_y^2 (\text{Var of } y = 5)$ and x and y are independent variable.
- (e) $X \sim B(n, p)$ and moment generating function of $X = \left(\frac{1}{3} + \frac{2}{3}e^t\right)^5$. Find $P(x=1)$
- (f) Show that $\Delta^2 y_2 = V^2 y_2$

UNIT-I

- Q2 (a) A computer password consists of a letter of the alphabet followed by 3 or 4 digits. Find (7)
- (i) The total number of passwords that can be formed.
- (ii) The total number of passwords in which no digit repeat.
- (b) Using binomial theorem find the value of $(3+\sqrt{2})^5 - (3-\sqrt{2})^5$. (5.5)

OR

- Q3 (a) A delegation of 6 members is to be sent abroad out of 12 members. In how many ways can the selection be made so that. (7)
- (i) A particular member is included?
- (ii) A particular member is excluded?
- (b) A bag contains 3 black and 4 white balls. Two balls are drawn at random one at a time without replacement. What is the probability that second balls white. (5.5)

UNIT-II

- Q4 (a) Find the probability that almost 2 defective fuses will be found in box of 200 fuses if experiences shows that 2% of such fuses are defective ($e^{-1} = 0.0183$) (5.5)
- (b) A random variable X with probability density function f(x) given by
- $$f(x) = \begin{cases} 2e^{-2x}; & x \geq 0 \\ 0; & \text{otherwise} \end{cases}$$
- What is the probability that X is not less than 2 and also find moment generating function? (7)

OR

P.T.O.