

Roll No.

Total No. of Pages : 03

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B.Tech.(AI & ML/DS/CSE/IT/Robotics & Artificial Intelligence/Internet of Things and Cyber Security including Block Chain Technology) (Sem.-02)

MATHEMATICS-II

Subject Code : BTAM204/18

M.Code : 91960

Date of Examination : 24-05-2024

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION - B & C. have FOUR questions each.
3. Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.
4. Select atleast TWO questions from SECTION - B & C.

SECTION-A

1. Write short notes on :

- (a) The marks out of 50 of a certain class consisting of 15 students in a class test are given below : 18, 19, 25, 29, 24, 23, 32, 40, 19, 26, 22, 20, 18, 35, 21. Find the mean score.
- (b) Two dices are rolled once. Find the probability of getting an odd number on the second die.
- (c) For a moderately skewed data, the arithmetic mean is 10, the coefficient of variation is 0.4 and Karl Pearson's coefficient of skewness is 0.02. Find the median.
- (d) For $n = 3$, $\sum D^2 = 4$, find the coefficient of rank correlation.
- (e) Find k for the following probability distribution ;

x	:	0	1	2	3	4	5	6	7
$F(x)$:	0	k	$2k$	$2k$	$3k$	k^2	$2k^2$	$7k^2 + k$.
- (f) Explain normal density function.

- (g) A random sample of 450 students has a mean score of 87.5. Can it be reasonably regarded as sample from a large population of mean 85 and standard deviation 60?
- (h) Explain the method of least squares to fit a straight line.
- (i) Let the probability density function $f(x)$ be positive at $x = -1, 0, 1$ and zero elsewhere, if $f(0) = 1/4$, find $E(X^2)$.
- (j) Write a short note on χ^2 - test for goodness of fit.

SECTION-B

2. (a) The mean of 10 numbers is 7 and mean of 15 other numbers is 12. Determine the mean of 25 numbers taken together.
- (b) A pack of playing cards was found to contain only 51 cards. The first 13 cards are examined and found to be all red, what is the probability that the missing card is black?
3. (a) Consider the set of data 1, 2, 4, 8, 16, 32. Find the second and third moment about the arbitrary value 1.
- (b) A coin is tossed two times. Find the expectation of number of heads.
4. Find the probability of a 4 turning up at least once in two throws of a fair die.
5. Find the coefficient of correlation between the values of X and Y given below :

X	65	66	67	68	69	70	72
Y	67	68	68	72	72	69	71

SECTION-C

6. The means of sample sizes 400 and 1600 are 70 and 65, respectively. Can the sample be regarded as drawn from the same population of variance 4 at 1% level of significance.
7. A set of 5 similar coins is tossed 320 times and the result is :

x :	0	1	2	3	4	5
y :	6	27	72	112	71	32

Test the hypothesis that the data follows a Binomial distribution.

8. The random variable X is normally distributed with mean 8 and standard deviation 4. Find the probability

(a) $5 \leq X \leq 10$

(b) $X \geq 15$

(c) $X \leq 5$

It is given that $P(Z \leq 0.5) = 0.5$, $P(Z \geq -0.75) = 0.2266$, $P(Z < 1.75) = 0.9599$.

9. Fit the a straight line to the following data :

x	0	5	10	15
y	10	15	20	25

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.