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SUBJECT CODE NO:- 2122 FACULTY OF SCIENCE AND TECHNOLOGY B.Sc. T.Y Sem. VI

Examination March/April-2022 (To Be Held In June/July-2022)

Mathematics

	1) Mathematical Statistics-II – MAT -603 OR	
[Time: 1:53 Hours] [Max. Marks: 50]		
N.B	Please check whether you have got the right question paper. 1. All questions are compulsory. 2. Figures to the right indicate full marks.	
Q.1	 A) Attempt any one a) Prove that the mathematical expectation of the sum of n random variables is equal to the sum of their expectations. b) If X is a random variable, then prove hat V(ax + b) = a²V(x) 	08
	 B) Attempt any one: c) Find the expectation of the number on a die when thrown d) In four number of heads. Tabulate the 16 possible outcomes with the corresponding values of x. By simple counting, derive the probability distribution x and hence calculate the expected value if x 	07
Q.2	A) Attempt any one:a) Find the moment generating function of exponential distribution.b) Find the median of normal Distribution	08
	 B) Attempt any one c) A and B play a game in which their chances of winning are in the ration 3:2 find A's chance of winning at least three games out of the five games played. d) Six coins are tossed 6,400 times. Using the poisson distribution, find the approximately probability of getting six heads r times. 	07
Q.3	 A) Attempt any one: a) Find the moments of Geometric distribution b) Prove that: Correlation coefficient is independent of change of origin and scale. 	05
	B) Attempt any one c) If X is Poisson variate and $p(x = 1) = P(x = 2)$, find $P(X = 4)$ and $P(X \le 4)$ d) Determine the binomial distribution for which the mean is 4 and variance 3 and find its mode	05
Q.4	Choose the correct alternative: 1) If X and Y are independent then COV(X,Y)= a. 1 b. 0 c1 d. 2	10

- 2) If $x \sim B(n, p)$, then E(x) =_____
 - a. Np
 - c. n^p

- b. (n-1)p
- d. n_{c_p}
- 3) The mean and median of normal distributions satisfies
 - a. Mean=median

b. Mean ≠ mediand. Mean > median

- c. Mean < median
- 4) In rectangular distribution variance is _

a. $\frac{1}{12}(b+a)^2$	b. $\frac{1}{12}(b-a)^2$
c. $\frac{1}{12}(b.a)^2$	d. $(\frac{1}{12}(b/a)^2)$

- 5) For the gamma distribution mean = variance =
 - a. 2λ
- b. 6λ
- c. λ

d. $\frac{4}{\lambda}$