JHARKHAND Rai University
RANCHI

End Semester/Reappear (Semester III) Examination December, 2024

Programme:B. Tech (CSE)

Course: Mathematics III (Probability & Statistics) **Full Marks: 70**

Course Code: BSC 201 **Time: 3 Hrs.**

Enrolment no. _____

Q. No.	Questions	CO	Bloom Taxonomy Category	Marks
	Section I			
1	**Short Answer type questions**			**4 x 5 = 20**
a	Explain (i) Probability Space (ii) Profitability Independence	CO1	Understand	
	or			
	Define the Bayes's Theorem with example.	CO1	Remember	
b	Define Skewness and Kurtosis.	CO2	Remember	
	or			
	Describe the Regression Co-efficient.	CO2	Understand	
c	Define binomial distribution and write its formula and mention all the term related to it.	CO1	Remember	
	or			
	Interpret a random variable X takes on the values -3, -1, 2, and 5 with respective probability (2k-3)/10 , (k+1)/10 , (k-1)/10,(k-2)/10 . Determine the distribution of X.	CO1	Understand	
d	Define co-efficient-of correlation and write the Kar Pearson formula.	CO2	Remember	
	or			
	Define Mathematical expectation and write property of it.	CO2	Remember	
	Section II			
Long Answer type questions				**3 x 10 = 30**
2	Prove that $r = \sqrt{b_{xy} \times b_{yx}}$	CO3	Apply	
	or			
	Find the correlation coefficient b/w x and y when the lines of regression are 2x- 9y+ 6 = 0 and x- 2y+1 = 0	CO3	Remember	
3	Find the co-efficient of rank correlation b/w the marks in statistic and mathematics obtained by ascertain group of student is 2/3 and the sum of the square of the difference in rank 55. Find the number of student in the group.	CO2	Apply	
	or			
	The given data relating to purchase and sales. Obtain the two-regression equation by the method of least square and estimate the likely sales when the purchase equal 100	CO2	Analyze	

Purchase	62	72	98	76	81	56	76	92	88	49
Sales	112	124	131	117	132	96	120	136	97	85

4	Suppose 3% of bolt made by a machine are defective the defects occurring at random during production. If bolts are packed 50 per box, find (i) exact probability (ii) Poisson approximation to it that a given box will contain 5 defectives	CO1	Apply	
	or			
	Summarise the a random variables X has mean μ= 25 and standard deviations $\bar{\sigma}$2,Use Chebyshev's in equality to estimate P (x ≤ 35)	CO1	Understand	
	Section III			
	Application based questions			**1 x 20 = 20**
5	(a) Classify is the difference between correlation and regression analysis? (b) (i) The regression coefficient of y on x and x on y are 1.2 and 0.3 respectively. Find the coefficient of correlation. (ii) If $\sigma_x = 10, \sigma_y = 12, b_{xy} = -0.8$, find the value of r. (iii) If $\bar{x} = 6,$ $= 7, b_{xy} = 0.65$ and $b_{yx} = 0.45$, then find the regression equations.	CO4	Analyze	
	or			

	Classify the first four moments about the working mean 28.5 of a distribution are 0.294, 7.144, 42.409 and 454.98. Calculate the moments about the mean. Also evaluate β_1, β_2 and comment upon the skewness and kurtosis of distribution.	CO4	Analyze	

COURSE OUTCOME

At the end the course the candidate will able to

CO1: Acquaintance with various methods of collecting data and get familiar with some elementary methods of data viz. Measures of central tendency, dispersion, skewness and kurtosis and to interpret them.

CO2: Understanding the basic concepts of probability and to find probabilities of various events.

CO3: Understand types of random variables, concepts of conditional probability and ability to distinguish between univariate and bi variate probability distributions; transformation of continuous random variable and its application.

CO4: Knowledge of characteristics of random variables such as expectation, variance and also to compute various generating functions