

12. a) The joint distribution of X and Y is given by $f(x, y) = \frac{x+y}{21}$,
 $x = 1,2,3; y = 1,2$. Find the marginal distributions of X and Y. 16 K3 CO2

OR

- b) The lifetime of a certain brand of an electric bulb may be considered a RV with mean 1200h and standard deviation 250h. Find the probability, using central limit theorem, that the average life time of 60 bulbs exceeds 1250h. 16 K3 CO2

13. a) From the following data, find (i) The two regression equations (ii) The coefficient of correlation between the marks in Mathematics and Statistics (iii) The most likely marks in Statistics when marks in Mathematics are 30. 16 K3 CO3

Marks in Maths: 25 28 35 32 31 36 29 38 34 32

Marks in Statistics: 43 46 49 41 36 32 31 30 33 39

OR

- b) The accompanying data resulted from an experiment comparing the degree of soiling for fabric copolymerized with the 3 different mixtures of met acrylic acid. Analyze the classification. 16 K3 CO3

Mixture 1: 0.56 1.12 0.90 1.07 0.94

Mixture 2: 0.72 0.69 0.87 0.78 0.91

Mixture 3: 0.62 1.08 1.07 0.99 0.93

14. a) In 30 tosses of a coin, the following sequence of head and tails is obtained HTTHTHHHTHHTTHTHTHHHTTHTTHTHTHT
 (i) Determine the number of runs
 (ii) Test at 0.10 level of significance, whether the sequence is random. 16 K3 CO4

OR

- b) Apply Mann-Whitney U test to determine if there is a significant difference in the age distribution of the two groups 16 K3 CO4
- Day College : 26 18 25 27 19 30 34 21 33 31
- Evening College: 32 24 23 30 40 41 42 39 45 35

15. a) For a random sampling from a normal population find the maximum likelihood estimators for 16 K4 CO5
- (i) The population mean, when the population variance is known.
- (ii) The population variance, when the population mean is known.
- (iii) The simultaneous estimation of both the population mean and variance.

OR

- b) Explain the brief details about the ARIMA models for time series forecasting. 16 K4 CO5