VIT
Vellore Institute of Technology

Winter Semester 2018-19

Continuous Assessment Test – II

Programme Name & Branch: B. Tech.(Common)

Course Name & Code:MAT2001& Statistics for Engineers | Slot: G2+TG2

Exam Duration: 90 minutes | Maximum Marks: 50

Use of statistical tables may be permitted

Answer All the Questions (5 × 10 = 50)

1. A simple correlation coefficient between Yield (X_1), Temperature (X_2) and rainfall(X_3) are given by $r_{12} = 0.6, r_{13} = 0.5$ and $r_{23} = 0.8$.

   (a) Calculate the relationship between Yield and Temperature when the rainfall is held constant.

   (b) Calculate multiple correlation coefficient treating

   (i) first variable as dependent and second, third variables as independent

   (ii) second variable as dependent and first, third variables as independent.

2. If 10% of the screws produced by an automatic machine are defective , find the probability that of 20 screws selected at random, there are
(i)exactly two defectives (ii) atmost three defectives (iii) atleast two defectives and (iv) between one and three defectives(inclusive) .

3. The life of a certain kind of electronic device has a mean of 300 hours and a standard deviation of 25 hours. Assuming that the distribution of life times which are measured to the nearest hour can be approximated closely with a normal curve, (i) find the probability that any one of these devices will have a lifetime of more than 350 hours. (ii)what percentage will have life time from 220 to 260 hours?

4. A manufacturer claimed that atleast 95% of the equipment which he supplied to a factory confirmed to specifications. An examination of a sample of 200 pieces of equipment revealed that 18 were faulty. Test his claim at a significance level of 0.01, 0.05. Also estimate the confidence limits for his claim at 5% level of significance.

5. A person buys 100 electric tubes from two well known makes taken at random from stocks for testing purpose. He finds that 'make A' has a mean life of 1300 hours with a standard deviation of 82 hours and 'make B' has mean life of 1248 hours with a standard deviation of 93 hours. Discuss the significance of these results to test which make of electric tube should the person buy at 1 % level of significance.