Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14MA3011** | **Duration :** | **3hrs** |
| **Sub. Name :** | **Bio Statistics and Quality Control** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Compute Median and Mode for the data given below:   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Class Interval | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 | 40-45 | 45-50 | | Frequency | 2 | 28 | 125 | 270 | 303 | 197 | 65 | 10 |   Also write the characteristics of measures of central tendency. | CO1 | 12 |
| b. | Derive the mean and variance of binomial distribution. | CO1 | 8 |
| (OR) | | | | |
| 2. | a. | In test of 2000 electric bulbs, it was found that the life of a particular make was normally distributed with an average life of 2040 hours and standard deviation of 60 hrs. Estimate the number of bulbs likely to burn for (i) More than 2150 hrs (ii) Less than 1950 hrs (iii) more than 1920 but less than 2160 hrs. | CO1 | 10 |
| b. | Compute quartile deviation and the coefficient of quartile deviation from the following data:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | Wages per week | 20 – 30 | 30 – 40 | 40 – 50 | 50 – 60 | 60 – 70 | 70 -80 | | No of person | 5 | 20 | 14 | 10 | 8 | 5 | | CO1 | 10 |
| 3. | a. | Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportions of men and women in favour of the proposal are same. | CO2 | 10 |
|  | b. | The weight of 10 people of a locality are found to be 70,67,62,68,61,68,70,64,64,66 kilograms. Is it reasonable to believe that the average weights of the people locality is grater than 64 kg. Test 5% Level of significance. | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | Calculate thetest of goodness of fit for the following data:   |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | O | 14 | 56 | 110 | 88 | 40 | 12 | | E | 10 | 50 | 100 | 100 | 50 | 10 | | CO2 | 8 |
|  | b. | Below are given the gain in weight of pigs fed on two diet A and B   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Diet A | 25 | 32 | 30 | 34 | 24 | 14 | 32 | 24 | 30 | 31 | 35 | 25 | - | - | - | | Diet B | 44 | 34 | 22 | 10 | 47 | 31 | 40 | 30 | 32 | 35 | 18 | 21 | 35 | 29 | 22 |   Test, if the two diets differ significantly as regards their effect on increase in weight. | CO2 | 12 |
| 5. | a. | A number of leaves were taken from each of half a dozen trees and their lengths measured. The following measurements are given below:   |  |  | | --- | --- | | Trees | Length | | 1 | 82 87 86 90 81 84 | | 2 | 85 84 91 92 88 | | 3 | 92 90 84 86 88 93 89 90 | | 4 | 80 82 87 81 82 82 | | 5 | 87 86 88 90 85 86 82 | | CO2 | 12 |
|  | b. | Compare RBD and LSD. | CO2 | 8 |
| (OR) | | | | |
| 6. | a. | Calculate the control limits in respect of chart and R-chart comment on the state of control for the following data: (Given A2 = 0.58, D3 = 0, D4 = 2.15)   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Sample No: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | Mean (): | 43 | 49 | 37 | 44 | 45 | 37 | 51 | 46 | 43 | 47 | | Range (R): | 5 | 6 | 5 | 7 | 7 | 4 | 8 | 6 | 4 | 6 | | CO3 | 10 |
|  | b. | Write short notes on   1. Producers risk 2. Consumer risk 3. Avearage sample number 4. O.C curve 5. Single Sampling Plan | CO3 | 10 |
| 7. | a. | 15 tape – recorders were examined for quality control test. The number of defects in each tape – recorder is recorded as below. Draw the suitable control chart and comment on the state of control.   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | No. of defects | 2 | 4 | 3 | 1 | 1 | 2 | 5 | 3 | 6 | 7 | 3 | 1 | 4 | 2 | 1 | | CO3 | 8 |
|  | b. | For a sampling plan N = 1200, n = 64 and c = 1, determine the probability of acceptance of the following lots: (i) 0.5% defective (ii) 0.8% defective (iii) 1% defective (iv) 2% defective (v) 5% defective (vi) 10% defective. Draw an OC curve, ATI , AOQ and alos obtain the value of AOQL | CO3 | 12 |
| (OR) | | | | |
| 8. | a. | Define double sampling plan and draw an Oc curve of the double sampling plan N = 1000, n1 = 50,c1 = 1,n2 = 25,c2 =2. | CO3 | 12 |
|  | b. | Explain what is single sampling plan and double sampling plan and also discuss its relative merits and demerit. | CO3 | 8 |
|  | | **Compulsory:** |  |  |
| 9. |  | Analyze the variance in the following Latin square of yields (in kgs) of paddy where A, B, C, D denote the different methods of cultivation.   |  |  |  |  | | --- | --- | --- | --- | | D122 | A121 | C123 | B122 | | B124 | C123 | A122 | D125 | | A120 | B119 | D120 | C121 | | C122 | D123 | B121 | A122 |   Examine whether the different methods of cultivation have given significantly different yields. | CO2 | 20 |

ALL THE BEST