LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Com., B.B.A.,** DEGREE EXAMINATION – **COMM. & BUSI. ADMIN.**

FOURTH SEMESTER – **APRIL 2012**

# ST 4208 - STATISTICS FOR MANAGEMENT

 Date : 19-04-2012 Dept. No. Max. : 100 Marks

 Time : 1:00 - 4:00

 **SECTION A**

 **Answer ALL questions**. **(10 X 2 = 20 marks)**

1. State addition theorem on probability.
2. Write Any four properties of normal distribution
3. Explain the term standard error.
4. State the assumptions made in analysis of variance.
5. Define index number and discuss their importance.
6. What is meant by Cost of Living Index Number?
7. What is statistical quality control? Point out its importance in the industrial world?
8. Distinguish between p chart and c chart.
9. Mention any two applications of linear programming.
10. What is balanced and unbalanced Transportation problem?

**SECTION B**

 **Answer any FIVE questions: (5 X 8 = 40 Marks)**

11.State and prove Boole’s inequality.

12. Five men in a company of 20 are graduates. If 3 men are picked out from this 20 persons at random,

 what is the probability that (i) all are graduates (ii) at least one is graduate?

13. The following table gives the data on the hardness of wood stored outside and inside the room.

|  |  |  |
| --- | --- | --- |
|  | Outside | Inside |
| Sample Size | 40 | 110 |
| Mean | 117 | 132 |
| Sum of squares of deviation from mean | 8655 | 27244 |

 Test whether the hardness is effected by weathering at 5% level

14. An IQ test was administered to 5 persons before and after they were trained. The results are given below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Candidates | I | II | III | IV | V |
| IQ before training | 110 | 120 | 123 | 132 | 125 |
| IQ after training | 120 | 118 | 125 | 136 | 121 |

Test whether there is any change in IQ after the training programme. Use 5% level of significance.

15. From the following data of wholesale prices of wheat construct Chain base index taking 1993 as origin.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Year | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 |
| Price(in Rs.) per quintal  | 50 | 60 | 62 | 65 | 70 | 78 | 82 | 84 | 88 | 90 |

16. State the advantages and disadvantages of statistical quality control.

17. The following table gives the number of defective items found in 20 successive samples of 100 items each

 2 6 2 4 4 15 0 4 10 18 2 4 6 4 8 0 2 2 4 0

 Comment whether the process is under control. Suggest suitable control limits for the future.

18. A company produces two types of pens say A and B. Pen A is a superior quality and pen B is a lower quality. Profit on pen A and pen B are Rs.5 and Rs.3 per pen respectively. Raw materials required for each Pen A are twice as that of pen B the supply of raw materials is sufficient only 1000 pens of per day. Pen A requires a special clip of only 400 clips are available per day. For pen B only 700 clips are available per day. Find graphically the product mix so that the company can make maximum profit.

 **SECTION C (2 X 20 = 40 Marks)**

**Answer any TWO questions:**

19. (a) A factory manufacturing television has four units A, B, C and D. The units A, B, C and D manufactures 15%, 20%, 30%, and 35%, of the total output respectively. It was found that out of their outputs 1%, 2%, 2% and 3% are defective. A television is chosen at random from the output and found to be defective. What is the probability that, it came from unit D? (10)

19.(b) Out of 8000 graduates in a town, 800 are females and out of 1600 graduates employees 120 are female. Use Chi-squaretest at 5% level to determine if any distinction is made in appointment on the basis of sex. (10)

 20. Develop the Two- way ANOVA for the following data:

 **Treatment**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | D |
| I | 3 | 4 | 6 | 6 |
| II | 6 | 4 | 5 | 3 |
| III | 6 | 6 | 4 | 7 |

(20)

21.(a) The number of defects detected in 20 items are given below

 Item No : 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

 No. of defects : 2 0 4 1 0 0 8 1 2 0 6 0 2 1 0 3 2 1 0 2

 Test whether the process is under control. Device a suitable scheme for future. (10)

21(b)Using the following data compute Fisher’s Ideal price and Quantity Index numbers for the current

 year and also verify factor reversal test.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| COMMODITY | Base year price | Current Year Price | Base year quantity | Current Year quantity |
| A | 8 | 12 | 6 | 4 |
| B | 10 | 12 | 8 | 8 |
| C | 14 | 18 | 4 | 4 |
| D | 4 | 2 | 6 | 10 |
| E | 10 | 14 | 10 | 8 |

 (10)

22(a). A company has 4 machine to be assigned to 4 of the 4 workers available for this purpose.

 The expected production from each machine operated by each workers is given below.

 WORKERS

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | W1 | W2 | W3 | W4 |
| I | 41 | 72 | 39 | 52 |
| II | 22 | 29 | 49 | 65 |
| III | 27 | 39 | 60 | 51 |
| IV | 45 | 50 | 48 | 52 |

 MACHINE

 Suggest optimal assignment of workers to machine. (10)

 22(b).Solve the following Transportation problem by using Vogel’s Approximation Method.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | D1 | D2 | D3 | D4 | D5 | Availability |
| A1 | 5 | 7 | 10 | 5 | 3 | 5 |
| A2 | 8 | 6 | 9 | 12 | 14 | 10 |
| A3 | 10 | 9 | 8 | 10 | 15 | 10 |
| Demand | 3 | 3 | 10 | 5 | 4 |  |

(10)

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