LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – COMMERCE& BUS.ADMIN.

FOURTH SEMESTER – APRIL 2010

ST 4208 - STATISTICS FOR MANAGEMENT

Date & Time: 19/04/2010 / 9:00 - 12:00 Dept. No. Max. : 100 Marks

SECTION - A (10 X 2 = 20 Marks)

Answer ALL questions.

1. State the axioms of probability.
2. State any four properties of normal distribution.
3. Define a simple random sample.
4. What is analysis of variance?
5. Define price relative and quantity relative of index numbers.
6. Mention the limitations of Index Number.
7. State any three applications of operation Research in management problems.
8. What is balanced and unbalanced assignment problem?
9. Distinguish between np chart and c chart.
10. Define Statistical Quality Control

SECTION - B (5 X 8 = 40 Marks)

Answer any FIVE questions.

11. State and prove multiplication theorem of probability.
12. Five mean in a group of 20 are graduates, If 3 men are picked. what is the probability that (i)all are graduate (ii) at least one is a graduate.
13. An automatic machine fills in tea sealed tins with mean weight of tea 1 kg and S. D. 1 gm. A random sample of 50 tins was examined and it was found that their mean weight was 999.50 gms. Is the machine wording properly?
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.

15. From the following Chain Base Index numbers ,calculate Fixed Base Index numbers.

Year:	1981	1982	1983	1984	1985
Index:	110	160	140	200	150

16. Solve the following L.P. Problem by graphical method.

Max$Z = 300x_1 + 400\ x_2$

Subject to the constraints:

$5x_1 + 4x_2 \leq 200$

$3x_1 + 5x_2 \leq 150$

$5x_1 + 4x_2 \geq 200$

$8x_1 + 4x_2 \geq 80$

$x_1, x_2 \geq 0$

17. Five jobs 1, 2, 3, 4 and 5 are to be assigned to five persons A, B, C, D and E. The time taken (in minutes) by each of them on each job is given below:

		Jobs				
		J_1	J_2	J_3	J_4	J_5
Person	A	16	13	17	19	20
	B	14	12	13	16	17
	C	14	11	12	17	18
	D	5	5	8	8	11
	E	5	3	8	8	10

Work out the optimal assignment and the total minimum time taken.

18. What are the advantages and disadvantages of SQC?

SECTION - C (2 X 20 = 40 Marks)

Answer any TWO questions.

19. (a) A factory manufacturing television has four units A, B, C, D. The units A, B, C, D manufactures 15%, 20%, 30%, 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?

19.(b) A manufacturer of pins knows that 2% of his products are defective. If he sells pins in boxes of 100 and guarantees that not more than 4 pins will be defective, what is the probability that a box will fail to meet the guaranteed quality? (e^{-2} =0.13534).

20. Perform two-way **ANNO** for the data given below:

Plots of Land	Treatment			
	A	B	C	D
I	38	40	41	39
II	45	42	49	36
III	40	38	42	42

21. (a) The following data is collected on two characteristics:

	Smokers	Non-Smokers
Literate	83	57
Illiterate	45	68

Based on this, can it be inferred that say that there is no relation between the habit of smoking and literacy.

21. (b) Calculate Laspeyre's, Paasche's and Marshall-Edgeworth's price Index number. Verify whether they satisfy Time reversal test and Factor reversal test.

Commodity	1980		1981	
	Price (in Rs.)	Quantity (in kgs.)	Price (in Rs.)	Quantity (in kgs.)
A	20	15	30	10
B	30	18	40	15
C	10	20	45	10
D	15	25	25	5

22. (a) Obtain an initial solution for the following transportation problem by North West Corner Method (NWCM)

Destination						
Origin		D_1	D_2	D_3	D_4	Supply
	O_1	2	6	4	8	120
	O_2	4	10	15	6	60
	O_3	3	7	5	9	120
	Demand	75	125	40	60	300

22. (b) The following table gives the number of defectives 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 future.

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