

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.B.A / B.Com.(CS) - DEGREE EXAMINATION – BUSI.ADM., COMM.
FOURTH SEMESTER – APRIL- 2013
ST 4208 : STATISTICS FOR MANAGEMENT**

Date : 29-04-2013
Time : 1.00 – 4.00

Dept. No.

Max. : 100 Marks

SECTION A

(10 X 2 = 20 marks)

Answer ALL questions.

1. State Bayes' theorem.
2. Three coins are tossed. Find the probability of getting (i) at least one head , (ii) exactly two heads .
3. What is Sampling Distribution of statistics?
4. Distinguish between null and alternative hypothesis.
5. Mention limitations of Index Number.
6. What is mean by cost of living Index? What are its Uses?
7. What are the control Charts?
8. Explain the terms of control charts for variable.
9. Explain the terms of objective function and constraints.
10. Describe an assignment problem.

SECTION B

(5 X 8 = 40 Marks)

Answer any FIVE questions

11. A husband and wife appeared in an interview for two vacancies in the same post. The probability of husband's selection is $\frac{1}{7}$ and that of wife is $\frac{1}{5}$. What is the probability that (i) both of them will be selected (ii) only one of them will be selected (iii) none of them will be selected.
12. For a binomial distribution with parameters $n = 5$, $p = 0.3$, find the probability of getting (i) at least 3 success (ii) utmost 3 success (iii) exactly 3 failures .
13. What is Sampling Technique ? Explain different types of Sampling.
14. A machine produced 20 defective articles in a batch of 400 . After overhauling it produced 10 defectives in a batch of 300. Has the machine improved?
15. From the following Chain Base Index numbers given blow, prepare Fixed Base Index Number.

Year	1991	1992	1993	1994	1995
Index	110	160	140	200	150

16. Explain the term Statistical Quality Control? Discuss its aspects and advantages.

17. The following data gives readings for 10 samples of size 6 each in the production of a certain components.

Sample	: 1	2	3	4	5	6	7	8	9	10
Sample Mean	:383	508	505	582	557	337	514	614	707	753
Sample Range	:95	128	100	91	68	65	148	28	37	80

Draw control chart for mean . can one assume that all the samples are from homogeneous lot.
(Given for $n = 5$, $A_2 = 0.58$, $D_3 = 0$, $D_4 = 2.11$)

18. Solve the following L.P. problem by graphical method.

$$\begin{aligned} \text{Maximize } Z &= 2x + 3y \\ \text{Subject to constraints,} \\ 3x + 2y &\leq 12 \\ 3x + 5y &\leq 15 \\ y &\geq 2 \\ x, y &\geq 0 \end{aligned}$$

SECTION C

(2 X 20 = 40 Marks)

Answer any TWO questions

19.(a) The chance that doctor D will diagnose the disease B correctly is 60% . The chance that a patient will die by his treatment after correct diagnosis is 40% and the chance of death by wrong diagnosis is 70%. A patient of doctor D who has disease B died. What is the chance that his disease was correctly diagnosed?

(10)

19.(b) Students of a class were given an aptitude test . Their marks were found to be normally distributed with mean 60 and standard deviation 5 . What percentage of students score

(i) more than 60 marks (ii) less than 56 marks (iii) between 45 and 65 marks . (10)

20.(a) A company keeps records of accidents . During a recent safety review a random sample of 60 accidents was selected and classified by the day of the week on which they occur

Day	Mon	Tue	Wed	Thu	Fri
No . Of accidents	8	12	9	14	17

Test whether there is any evidence that accidents are more likely on some days than others ? (10)

20.(b) The following table gives three machines are used for a production. On the basis of the outputs, test whether the machines are equally effective. Give that value of F at 5% level of significance(2,9)df = 4.26

Machine I	Machine II	Machine III
10	9	20
15	7	16
11	5	10
10	6	14

(10)

21.(a) The following data refer to the number of defectives in 10 samples of 100 items each. Construct an appropriate control chart and interpret the control limits:

Sample No	: 1	2	3	4	5	6	7	8	9	10
No. of defects	: 4	8	11	3	11	7	7	16	12	6

Draw the p – chart to show the fraction defectives are under control. (10)

21(b) Calculate Laspeyre's Index number, Paasche's price index number and Marshall-Edgeworth Index and how it satisfies Time reversal test and Factor reversal test.

Commodity	2005		2006	
	Price (in Rs.)	Quantity (in kgs.)	Price (in Rs.)	Quantity (in kgs.)
A	6	50	10	56
B	2	100	2	120
C	4	60	6	60
D	10	30	12	24
E	8	40	12	36

(10)

22.(a) Solve the following Transportation problem by using Vogel's Approximation Method.

	A	B	C	D	Availability
X	6	1	9	3	70
Y	11	5	2	8	55
Z	10	12	4	7	90
Demand	85	35	50	45	

(10)

22(b) Solve the following game :

		Player A			
		a ₁	a ₂	a ₃	a ₄
Player B	b ₁	2	-4	6	-5
	b ₂	4	3	7	9
	b ₃	-2	5	6	-3

(10)

