



Jain College, Jayanagar
II PUC Mock Paper – II
Sub: STATISTICS

Duration: 3 Hrs 15 mins

Max.Marks: 100

- Note: 1. Statistical tables and graph sheets will be supplied.
2. Scientific calculators are allowed.
3. All working steps should be clearly shown.

PART – A

I. Answer any ten questions:

1×10 =10

1. Define longevity.
2. Which index number is used in the fixation of salary?
3. Which reversibility test satisfied by Marshall Edgeworth's index number.
4. Mention the component of time series associated with decrease in petroleum price.
5. Mention the mean of standard normal variate.
6. What is the range of t-distribution?
7. What is standard error?
8. What is an estimate?
9. What is confidence coefficient?
10. What is control chart?
11. What do you mean by non-degenerate solution in a transportation problem?
12. In a rectangular game, if saddle point exists and maximin is -4, what is the value of minimax?

PART – B

II. Answer any 10 questions:

2×10 =20

13. Give any two comparison of CDR and STDR.
14. If Dorbish Bowley's price index number is 138.2 and Paasche's index number is 139.3 Then find Laspeyre's price index numbers.
15. Why Fisher's index number called Ideal index number?
16. Mention the factors causing seasonal variation?
17. Mention the conditions for applications of Binomial expansion method of interpolation.
18. Bernoalli variate with $p = 0.7$, write down the probability mass function and find the variance.
19. In a normal distribution, given $P(-0.8 < Z < 0.8) = 0.5672$, find $P(0 < Z < 0.8)$
20. Define Type I and Type II error.
21. Mention two conditions for applicability of χ^2 - test of goodness of test.
22. Write down upper and lower control limits for number of defects when standards are known.
23. Mention any two needs for replacement?
24. Define (i) Holding cost (ii) set-up cost.

PART – C

III. Answer any 8 questions:

5×8 = 40

25. Calculate CDR, IMR and ASDR's for age groups (15-30), 50 and above from the data.

Age (in yrs)	Population (in '000s)	No of deaths.
Below 1	20	350
1-15	30	220
15-30	35	100
30-50	20	230
50&above	15	360

26. Calculate Marshall-Edgeworth's Price index number.

Items	2006		2008	
	Quantity	Value	Quantity	Value
A	25	750	30	960
B	30	450	25	550
C	5	250	6	360
D	6	90	7	210
E	10	140	10	190
F	4	48	5	65

27. Compute the cost of living index number for the data given below and comment

Groups	Price		Weights
	Base year	Current year	
Food	1200	1600	20
Clothing	400	600	10
Fuel & light	800	1000	15
Entertainment	200	400	8
Medicine & Education	300	600	12
Misc	1450	1800	25

28. Find 3-yearly moving averages for the following time series and show the trend line on a graph.

Year	2005	2006	2007	2008	2009	2010	2011
Sales (in units)	30	36	39	33	39	45	42

29. From the following frequency distribution find the number of students whose marks is less than 45.

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

30. If 98% of electric bulbs manufactured by a company are known to be non-defectives, what is the probability that a sample of 150 electric bulbs taken from the production process of that company would contain (i) exactly one defective (ii) more than two defectives?

31. Fit a Binomial distribution for the data and obtain theoretical frequencies.

x	0	1	2	3	4
f	8	32	34	24	5

32. For the following data test whether there is any significant in the population proportion at 5% level of significance.

	Size	Proportion
Sample I	1000	0.03
Sample II	1500	0.01

33. Students of five colleges of a certain locality participated in a match and scored the following points: 3, 2, 5, 4, 1. Test at 5% l.o.s the hypothesis that the variance of the population of points is more than 3.

34. Ten samples of 100 each of PVC pipes manufactured by a firm are inspected for the number of defectives. The number of pipes having defects are below:

Sample no	1	2	3	4	5	6	7	8	9	10
Defective pipes	2	1	3	0	2	2	4	4	5	6

Calculate the control limits for np-chart.

35. Solve the following LPP graphically.

$$\text{Max } Z = 2x + y$$

S.t, $x - y \leq 10$

$2x - y \leq 10$

And $x, y \geq 0$.

36. A machine costs Rs 35,000 and the operating cost is estimated to be Rs 1500 for the first year and increases by Rs 3000 every year for next 5 years. Determine the optimum period for replacement of the machine, assuming that the machine has no resale value.

PART – D

IV. Answer any 2 questions:

10×2 =20

37. (a) Compute standardize death rates of town A and town B. State which town is healthier?

Age (in yrs)	Town A		Town B		Standard Population
	Population	Deaths/1000	Population	Deaths/1000	
0-9	13500	20	8700	24	35000
10-29	12000	10	6900	12	30000
30-59	8900	15	5500	18	20000
60 & above	5000	18	3700	20	15000

- (b) From the following data calculate TFR.

Age (in yrs)	Female population	No. of births occurring to females
15-19	8943	271
20-24	8356	1343
25-29	8431	1492
30-34	8013	1026
35-39	7963	731
40-44	7346	182
45-49	6700	42

38. Calculate Marshall-Edgeworth’s and Dorbish-Bowley’s price Index numbers. Test whether they satisfy Time Reversal Test.

Items	2012		Expenditure	
	Price	Quantity	Price	Quantity
A	12	14	14	15
B	16	17	20	16
C	11	18	13	19
D	10	15	9	14

39. Below are given the figures of production in (‘000s) of a sugar factory.

Years	2000	2002	2004	2006	2008	2010	2012
Production(in millions)	80	90	92	83	94	99	92

- Fit a straight line trend
 - Compute the trend values.
 - Estimate the production for the year 2014.
40. Fit a poisson distribution to the following data

No. of cars sold	0	1	2	3	4	5	6&more
No. of days	18	43	45	28	12	3	1

Test whether the poisson distribution is a good fit.

PART – E

V. Answer any 2 questions:

2 × 5 =10

41. The hourly wages of workmen are normally distributed with mean of Rs 70 and S.D of Rs 5. Find the probability of workers whose hourly wages will be (i) more than Rs 80 (ii) Between Rs 69 & Rs 72.
42. 400 women shoppers are chosen at random in market A, their average weekly expenditure on food is found to be Rs250 and S.D of Rs 40. The figures are Rs 220 & Rs 55 respectively where also 400 women shoppers are chosen at random. Test at 5% l.o.s whether their average weekly food expenditure of women shoppers are equal.

43. To list the effectiveness of inoculation against cholera the following table was obtained.

	Attacked	Not attacked
Inoculated	16	32
Not inoculated	08	24

Test at $\alpha = 5\%$, whether inoculation and attack of cholera are independent.

44. Two players A and B play a game. 'A' writes either red or blue or green on a piece of paper and he hides what he has written from his opponent. Player 'B' writes without that A has written should guess it. If his guess is correct A should pay Rs 100 to 'B'. Otherwise B should pay Rs 60 to 'A'. write down the pay off matrix of player A. Does the game have a saddle point?
