Jain College, Jayanagar
II PUC Mock Paper (II) 2017-18
Sub: STATISTICS

Duration: 3 Hrs 15 mins **Max.Marks: 100**

PART – A

I. Answer any ten of the following questions:

10×1 =10

1. What is longevity in life table?
2. Which index number shows upward bias?
3. Name the index number which satisfied both time reversal test and Factor reversal test?
4. Which component of time series is associated with deaths due to tsunami?
5. For a Bernoulli distribution, if P = 0.73 find S.D.
6. If variance of chi-square distribution is 8, find its mean.
7. Mention a use of standard error.
8. Define level of significance.
9. Write down the standard error of differences of two sample means.
10. In $\bar{x}$-chart if one of the sample mean lies outside the control lines/limits, what would you conclude?
11. Define a solution to a L.P.P
12. Write down one advantage of inventory?

PART – B

II. Answer any 10 questions, each question carries two marks: 2×10 =20

13. In a town in a year 2000 live births occurred and of these live births in 10 cases, the mother died due to child birth, compute MMR.
14. State two characteristics of index numbers.
15. If $\sum p_0 q = 1400$ and $\sum p_1 q = 1650$. Compute suitable index number.
16. Write any two demerits of least square method.
17. Expand $(y-1)^5=0$ the binomial expansion.
18. For a chi-square variate with 8 degrees of freedom, obtain mean and mode of the distribution.
19. Write two features of students –t distribution.
20. A random sample of size 23 is drown from a population whose standard derivations is 4 compute standard error of the sample mean.
21. Define size and power of a test.
22. The average number of defect per square meter of mat is known to be 4. Find the upper control limit for the number of defects.
23. Mention two method of obtaining initial basic feasible solution for a transportation problem.
24. The objective function and two solutions of on L.P.P are Max Z=200x+100y and A(0.5) B (10.7). find the optimal value of Z.

PART – C

III. Answer any 8 questions: each carries Five marks : 8×5 = 40

25. Calculate gross reproduction rate for the following date.

Age-group (in-years)	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Female population	1000	900	800	700	600	500	400
Female births	20	60	50	30	20	10	10

26. Mention the steps involved in the construction of an Index Number. Explain any two of them.

27. Compute cost of living index number.

Group	Price		Weight
	Base year	Current year	
Food	130	170	65
Clothing	50	60	20
Fuel	90	110	20
Entertainment	30	50	15
Medicine	40	70	10
Other	50	90	15

28. Compute 4 – year moving averages from the following data

Year	2008	2009	2010	2011	2012	2013	2014	2015
Profit (in 000Rs)	100	120	150	160	190	210	350	415

29. Find out the missing values in the following data.

X	2	4	6	8	10	12
Y	9	?	14	17	?	26

30. The probability that a bomb hits a bridge is 2/5, 4 bombs are aimed at a bridge. Find the probability that (i) the bridge is destroyed (ii) None of the bombs hit the bridge

31. Write down the five properties/Features of normal distribuation.

32. A sample of 50 children is taken from a school the average weight of children is 28 kgs and SD is 5 kgs. Test at 1% level of significance that can we assume that the average weight of the school children is less than 30 kgs.

33. From the following data. Test whether literacy and smoking are independent at 5% level of significance.

	Non smokers	Smokers
Literates	20	18
Illiterates	15	25

34. Following table gives mean ($\bar{x}$) and range (R) of 6 samples of size 4 each.

Sample No	1	2	3	4	5	6
$\bar{x}$	10	11.4	9	13	17.2	18.6
R	8	7	4	9	8	9

Find the control limits for drawing $\bar{x}$-chart.

35. Solve the following LPP graphically

Minimize $Z = 5x + 8y$

Subject to $3x + 2y \leq 18$

$4x+3y \geq 12$

And $x, y \geq 0$

36. Solve the following game using maximin - minimax principle.

		Players			
		B_1	B_2	B_3	B_4
Payment	A_1	0	5	4	2
	A_2	-1	0	-2	-3
	A_3	-3	1	-3	0

PART – D

IV. Answer any of the following 2 questions, each questions carries Ten marks: 2×10 =20

37. From the following data calculate the TFR's, and compare the fertility of two cities.

Age groups	Female population		Number of live births	
	City A	City B	City A	City B
15-19	13000	45000	1200	1250
20-24	14000	50000	2250	7300
25-29	12000	46000	2500	9550
30-34	10000	42000	1200	5400
35-39	15000	40000	945	1245
40-44	12000	35000	394	510
45-49	9000	30000	34	50

38. Show that Marshall-Edgeworth's Index number satisfies TRT and Fisher's Satisfies TRT and FRT.

	Base year		Current year	
Articles	Price	Quantity	Price	Quantity
A	10	6	15	5
B	12	10	15	10
C	18	5	27	3
D	8	5	12	4

39. For the following time series fit a linear trend of the type y= a +bx and obtain the trend. Values.

Estimate the production for the year 2007

Year	2000	2001	2002	203	2004	2005
Production (in quintals)	80	110	100	140	120	150

40. Fit a poisson distribution to the following data & test for goodness of fit at 5% level of significance.

No of Mistakes	0	1	2	3	4	5 and more

No of pages	31	34	21	12	2	0

PART – E

V. Answer any 2 of the following questions, each question carries five marks: 2 × 5 =10

41. The marks scored by the students of a class follow normal distribution with 80 and SD 5 find the probability that a student selected at random from the class scored

    (i) More than 90 marks (ii) between 70 & 85 marks.

42. A retailer buys 720 pens from a manufacturer A and finds by inspection that 26 of them are defective test whether more than 2% of the pens manufactured by a are defective.

43. From the following data. Test whether mean life of Brand B bulbs are longer than that of Brand A bulbs

	Brand A	Brand B
Sample size	12	15
Mean life (hrs)	1240	1370
Variance	1000	2000

44. For the following transportation problem, find the initial basic feasible solution by matrix minima method and obtain the cost associated with solution

	Warehouse				
Factory		I	II	III	Availability
	A	15	10	9	350
	B	5	8	9	100
	C	10	6	4	110
Requirement		80	150	330	

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