JAIN COLLEGE

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Date: *II PUC*   *SUBJECT: STATISTICS*
                                      Mock paper II

Timings Allowed: 3 Hrs15Minutes.   *Total Marks: 100*

INSTRUCTIONS: 1. Graph sheets and statistical tables will be provided on request.
                              2. Scientific calculators may be used.
                              3. All working steps should be clearly shown.

Section- A

I. *Answer any ten of the following questions:*   *10X1=10*
1. What is longevity in life table
2. Define price relative
3. Write down the Dorbish-Bowley's quantity index number.
4. Which index number is used for the measurement of seasonal variation?
5. Write down the P.M.F of a hyper geometric distribution.
6. Which distribution SD and variance are equal?
7. Write down the chi-square test statistic for test of variance.
8. Define point estimation in the test of hypothesis.
9. Write a merit of acceptance sampling in SQC.
10. What is T.P?
11. What is E.O.Q/E.L.S?
12. Given $H_1: \mu_1 > \mu_2$. Write down H_0.

Section- B

II. *Answer any ten of the following questions:*   *10X2=20*
13. Estimate the population at the end of the year. Given population at the beginning of the year is 1, 26,300. The number of births is 24,500 and deaths in the year are 14,850 and immigrants are 8,065 and emigrants 6,000.
14. Calculate P_{01} by simple average of price relative method using arithmetic mean.

Items	A	B	C	D
PRICE (2010)	24	18	30	15
PRICE (2014)	27	17	30	18

15. State circular test in index number.
16. Given the parabolic equation $y=a+bx+cx^2$. Write down the normal equations.
17. Write the formulae of finding 'x' and 'y' of newton's method of interpolation.
18. Bernoulli variate with P=0.7. Write down the probability mass function and find the variance.
19. Write down the probability mass function of hyper geometric distribution with a=12,b=8,n=5 with range.
20. Define acceptance region and rejection region under testing of hypothesis.

21. Given the following information. Find S.E $(\bar{x}_1 - \bar{x}_2)$

Samples	Sample size	Sample mean	Sample variance
A	100	45	25
B	200	35	16

22. Write down upper and lower control limits for number of defects when standards are known.

23. Does the following game have saddle point?

	B$_1$	B$_2$
A$_1$	3	2
A$_2$	5	4
A$_3$	0	-1

24. Mention the two objectives of transportation problem.

Section- C

III. Answer any eight of the following questions: ***8X5=40***

25. A) Calculate Crude birth rate and general fertility rate for the following data

Age (years)	0-14	15-19	20-29	30-39	40-49	50+
Population Men	12000	14500	12800	9400	8400	7500
Women	11100	13200	11600	8800	7900	7200
No. Of live births	-	196	460	500	231	-

B) The quinquennial A.S.F.R for women of child-bearing group of a community are 25, 60, 70, 40, 20, 12 and 5. Compute T.F.R.

26. Test whether Marshall-Edgeworth's and Fischer's indices satisfy time reversal test.

27. Calculate Laspeyre's quantity index number

Items	Price (2008)	Quantity (2012)	Expense (2008)
A	5	7	30
B	4	3	16
C	6	8	48
D	8	10	72
E	2	1	4

28. Compute 5 yearly moving averages for the following time series and indicate trend

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
Value	27	28	30	32	29	31	34	36	35

29. Interpolate the missing values from the following data using binomial expansion method

Year	2006	2007	2008	2009	2010	2011	2012
Value	64	60	?	56	55	50	?

30. There are 100 wrist watches in a box ,4 of them are defective .A random sample of 4 wrist watches are selected .What is the probability of getting less than 3 defective wrist watches? If there are 50 such boxes, in how many of them will you find exactly one defective wristwatch?

31. Write five features of Poisson distribution

32. From the following table, test whether the sample means differs significantly at 5% L.O.S.

	I	II
Sizes	80	90
Means	52	55
SD	8	7

33. A die is rolled 90 times and the following distribution is obtained.

Face value	1	2	3	4	5	6	Total
No of throws	10	18	11	13	20	18	90

34. Draw R-chart for the following data and give your conclusion. R: 6,5,8,4,1,2 and n=5.

35. Solve the following L.P.P graphically.

Mininize Z=4x+3y

Subject to x+y ≤ 2

x+3y ≥3 and x,y≥0

36. A machine costs Rs 35,000 and the operating cost is estimated to be Rs1,500 for the first year and increase by Rs 3,000 every year for next five years. Determine the optimum period for replacement of the machine, assuming that the machine has no resale value.

Section- D

IV. Answer any two of the following questions: 2X10=20

37. For the following data, compute standardized death rate and give your conclusion regarding healthier condition of 2 villages.

Age(Years)	Village A		Village B		Standard population
	Population	Deaths	Population	Deaths	
0-10	600	18	400	16	500
10-20	1000	10	1500	6	1200
20-60	3000	24	2400	24	2500
60-100	400	20	700	21	500

38. Construct Fischer's index number for the following data. Test whether it satisfies T.R.T & FR.T

COMMODITY	Base year		Current year	
	Price (Rs)	Quantity	Price (Rs)	Expenditure
A	7	70	9	100
B	9	80	11	110
C	15	25	20	40
D	20	30	25	40

39. Fit a second-degree equation of the type $y=a+bx+cx^2$ to the following data and estimate the profit for the year 2015.

Year	2010	2011	2012	2013	2014
Profit (000's)	10	12	13	10	8

40. Following is the data regarding the number of mistakes per page found in a book. Fit a Poisson distribution. Test at 5% L.O.S. that it is good fit.

No of mistakes per page	0	1	2	3	4
No. of pages	24	13	5	5	3

Section- E

V. Answer any two of the following questions: *2X5=10*

41. The daily wages of workers of a factory are normally distributed with mean Rs.700 and SD Rs.40. Find the probability of workers whose daily wages will be a) More than Rs.800 b) Between Rs.690 and Rs.720.

42. For the following data test whether there is any significant difference between the population proportions at 5%LOS.

Sample	I	II
Size	110	140
Proportion	0.02	0.01

43. Following is data regarding the I.Q. of five students before and after treatment of Yoga.

I.Q before	118	120	116	115	125
I.Q after	125	118	125	120	130

44. The cost of a scooter is Rs36,000. Its maintenance cost and resale value at different age given below:

Years of service	1	2	3	4	5	6
Maintenance cost (Rs)	800	1300	1900	2700	3900	5400
Resale value (Rs)	28000	22000	20000	18000	17000	16000

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