SRI BHAGWAN MAHAVEER JAIN COLLEGE, V.V.PURAM, BANGALORE

II PUC MOCK PAPER - 2

STATISTICS

SECTION: A

I. Answer any 10 of the following questions **1 X 10 = 10**

1. Define Longevity.
2. If the general price level goes up by 70 % between 2000 and 2010, what is the index number for 2010 with base 2000 ?
3. Define Consumer Price Index Number.
4. What is Random Variation ?
5. Write down the Bernoulli distribution with parameter $p = 0.42$
6. Write the relationship between mean and variance of a Binomial distribution.
7. What is two tailed test ?
8. Define Degrees of Freedom.
9. What is an estimator ?
10. What is defect ?
11. When is a T.P. Balanced ?
12. If in a game the pay off at saddle point is 6, What is the value of minimax ?

SECTION: B

II. Answer any 10 of the following questions **2 X 10 = 20**

13. The quinquennial ASFR's for women of child bearing age of a community are 26,63,65,46,24,13 and 7. Compute TFR.
14. Why Fisher's index number is ideal ?
15. State two norms for the selection of base year.
16. Write down the normal equations for fitting quadratic trend.
17. Write down the conditions for application of Binomial expansion method of interpolation and extrapolation.
18. In a poisson distribution, the first two frequencies are 250 and 125 respectively. Find the next frequency term.
19. If $Q_1 = 20$ and $Q_3 = 60$, find the mode of the normal distribution.

20. Given $\bar{x}$ = 203, μ = 200gm, σ = 10 gm and n = 64, calculate test statistic Z
21. Write the uses of standard error.
22. What are single and double sampling plans ?
23. Which of the two feasible solutions (12,10) and (14,4) of an L.P.P, maximizes the objective function, Z = 5x+4y.
24. If the depreciation cost and the cumulative maintenance cost for an equipment for the third year is Rs.10,000/- and Rs.10,400/- respectively. Find the annual average cost.

SECTION: C

III. Answer any EIGHT of the following questions **5 X 8 = 40**

25. Compute CBR and GFR from the following table.

Age (in years)	Male population	Female population	No. of live Births
0-14	20730	19840	0
15-19	7366	7310	212
20-24	7300	7120	657
25-29	6300	5860	592
30-39	9980	9120	326
40-49	7400	6910	81
50 & above	8400	7900	0

26. Explain briefly the steps involved in the construction of cost of living index number
27. From the following data, calculate unweighted geometric mean index number

Commodity	Price	
	Base Year	Current Year
A	20	30
B	25	20
C	15	30
D	45	50

28. Explain the components of time series.
29. Interpolate the number of persons below the age 70 years from the following data :

Age (in years)	0-20	20-40	40-60	60-80	80-100
No. of Persons	333	160	135	67	65

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 bulb ? (ii) more than two defective bulbs ?

31. There are 20 fruits in a basket, out of which 8 are mangoes and rest are oranges. A girl picks 5 fruits at random from the basket. Find the Probability that she gets 3 mangoes.
32. A machine produced 5 defective articles among 80. After some repair, the machine produced 3 defective articles among 60. Test whether the proportion of defective articles have reduced after repair at 5% level of significance.
33. From the following data regarding eye-colour of fathers and their sons, test whether father's eye-colour and son's eye-colour are independent. Apply chi-square test at 1% level of significance.

Father's Eye Colour	**Son's Eye Colour**	
	Light	**Dark**
Light	100	75
Dark	70	125

34. Following table gives means and range of 6 samples of size 5 each. Compute control limits for Range chart.

Sub group No.,	1	2	3	4	5	6
Mean	10	11	10	12	15	18
Range	5	7	4	9	6	5

35. Obtain an initial basic feasible solution to following T.P by matrix minima method. Also obtain the transportation cost.

	To			**Available**
From	7	3	4	2
	2	1	3	3
	3	4	6	5
Demand	4	1	5	10

36. Solve the following LPP graphically.

Max Z = x + y

S.t $x + y \geq 1$

$3x+y \leq 3$

and $x, y \geq 0$

SECTION: D

IV.	Answer any TWO of the following questions	2 X 10 = 20
37.	From the following data, calculate TFR's and compare the fertility of two cities.	

Age group (in years)	Female population		Number of live births	
	City 'A'	City 'B'	City 'A'	City 'B'
15-19	14000	47000	1204	1222
20-24	15000	50000	2295	7400
25-29	14000	46000	2590	9660
30-34	12000	44000	1236	5544
35-39	13000	40000	936	1360
40-44	12000	39000	288	507
45-49	11000	30000	33	60

38. Construct Fisher's price index number from the following data and test whether it satisfies Time Reversal Test and Factor Reversal Test

Items	Prices		Expenditures	
	2010	2012	2010	2012
A	12	10	96	90
B	18	20	72	100
C	15	20	90	160
D	20	22	100	88
E	10	08	90	64

39. For the following time series, fit a quadratic trend of the type $y = a+bx+cx^2$ and also estimate the consumption for the year 2011.

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009
Consumption (in thousand Kg's)	55	75	86	105	140	175	186	182	179

40. The daily wages from a random sample of 5 labourers from town 'A' was found to be 75,85,80,85,82. Another random sample from town 'B', the daily wages of 8 labourers was found to be 70,100,75,92,75,70,90,95. Test whether the mean daily wages of labourers of town 'B' is more than town 'A'. Use $\propto = 5\%$

SECTION: E
(PRACTICAL ORIENTED QUESTIONS)

V. Answer any TWO of the following questions **2 X 5 = 10**

41. The distribution of monthly incomes of 5000 people may be assumed to be normal with mean of Rs.20,000/- and a standard deviation of Rs.2,000/-. Estimate the number of people with incomes
    (i) Exceeding `23,000/- per month
    (ii) Between `18,000/- and `23,000/- per month.
42. A pharmaceutical firm maintains that the mean time for a drug to have effect is less than ½ hour. In a sample of 125 trials, the mean time is 30.6 minutes with variance 4 minutes^2. Test the firm's claim at $\propto = 0.01$.
43. The variance of the height of 20 SSLC students is 4 cm^2. Test at 1% level of significance that the variance of height of SSLC students is more than 3cm^2
44. The demand for motor cycle tyres is 500/year. The cost of placing an order is Rs.250/-. Holding cost is Rs.25/- per annum. The penalty cost for not supplying on demand is Rs.10/- per month. Find the optimal lot size and maximum shortage level.

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