II PUC MOCK PAPER - 1

STATISTICS

SECTION –A

I. **Answer any Ten of the following questions   10 x 1 =10**
1. Define expectation of life?
2. Why index numbers are called economic barometers?
3. What is meant by chain base index number?
4. Name any one use of time series.
5. What is meant by bernoulli trial.
6. Name the distribution in which variance and standard deviation are same.
7. What is Interval estimation?
8. Define significant value.
9. In a chi- square distribution for goodness of fit , if there are 8 classes and one parameter is estimated then find the degrees of freedom for test statistics
10. Define Acceptance Sampling?
11. Give one example for equipments which deteriorate with the age?
12. What is meant by lead time?

SECTION-B

II. **Answer any ten of the following Questions:-   10 x 2 = 20**
13. Explain Registration method?
14. Write any two limitations of index number.
15. If $P^L_{01} = 142.3$ and $P^{D.B}_{01} = 143.2$ find $P^P_{01.}$
16. Diagramatically represent Business cycle with stages.
17. Define Interpolation and Extrapolation.
18. Find the variance of a hypergeometric distribution with parameters a=10, b=6 and n=4.
19. If the parameter of t-distributioon is 7, Find the Mean and S.D
20. Given $\sigma^2 = 25$ cm^2 and n= 49. Calculate Standard error of sample mean.
21. What is the Type I and Type II error?
22. Write any two relative merits and demerits of acceptance sampling plans.
23. In an LPP define optimal solution and multiple solution?
24. Mention the methods of finding initial basic feasible solution in transportation problem.

III. Answer any eight of the following Questions:-   **8x5=40**

25. Calculate NRR and comment on the result.

Age Group	Female Population	Female Births	Survival Rates
15-19	1500	25	0.975
20-24	1600	35	0.965
25-29	1850	90	0.955
30-34	1750	70	0.958
35-39	1730	45	0.943
40-44	1600	10	0.932
45-49	1500	2	0.928

26   Explain TRT and FRT.

27   Compute weighted geometric mean index number and comment.

Item	Price in ` / unit		Weight
	Base Year	Current year	
A	20	30	10
B	40	50	4
C	100	100	5
D	120	90	3

28. Find 4 yearly centered moving averages for the following data.

Year	2008	2009	2010	2011	2012	2013	2014	2015
value	54	40	47	48	42	42	36	40

29. Interpolate the business in 2010 and extrapolate for the year 2014 for the following data.

Year	2002	2004	2006	2008	2010	2012	2014
Business (in lakhs)	80	150	235	365	-	780	-

30. A car hire agency has two cars on an average there is a demand for one car during a particular hour. What is the probability that (1) both the cars are free (ii) some demand is refused.

31. Write any five properties of Normal Distribution?

32. A sample of 100 students is found to have average height 64 inches . Can it be reasonabally regarded as a sample from a large population with mean height 66 inches and Standard deviation 4 inches? Test at 1% and 5% levels of significance.

33. From the following data test whether mean life of brand B blubs is longer than that of brand A bulbs.

	Brand A	Brand B
Sample size	12	12
Mean Life (hours)	1240	1370
Variance (hours)	1000	2000

34. In a motor car manufacturing company the chasis are being painted. The number of defects on painted chasis are noted below.

Chasis Number	1	2	3	4	5	6	7	8	9	10
No of Defects	13	6	5	8	16	8	4	0	2	7

Compute suitable control limits.

35. Solve the rectangular game for player B using Maximum Minimax Principle

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\begin{array}{cccc}
 & B_1 & B_2 & B_3 \\
A_1 & 12 & 3 & -15 \, . \\
A_2 & 0 & 5 & -14 \\
A_3 & 5 & 10 & 3
\end{array}
$$

36. A firm is considering replacement of a machine whose purchase price is `12,200 . Its scrap value is `200. The maintainance costs found from experience are as follows. Suggest optimal replacement policy.

Year	1	2	3	4	5	6	7	8
Maintenance cost (in `)	200	500	800	1200	1800	2500	3200	4000

SECTION D
IV. **Answer any two of the following questions:**   (2x10=20)

37. Compute CBR, ASFR and TFR for the following data.

Age Group	Female Population	Male Population	No. of Births
0-14	48000	50000	
15-19	49000	51000	7300
20-24	46000	45000	9800
25-29	45000	44000	5400
30-34	40000	40000	1400
35-39	38000	39000	1300
40-44	31000	30000	600
45-49	30000	29000	400
50 and above	15000	18000	-

38.Compute Paasche's, Marshall –Edgeworth's, Dorbish Bowley's and Fisher's index numbers.

Item	2012		2014	
	Price	Quantity	Price	Quantity
P	5	6	6	7
Q	7	12	6	13
R	6	15	8	15
S	8	10	8	12

39. The sale of a company for the years 2006 to 2012 are given below. Estimate sales for the year 2013 using an equation of the form $y=ab^x$

Year	2006	2007	2008	2009	2010	2011	2012
Sales ('000 `)	32	47	65	92	132	190	275

40. Five identical coins are tossed 128 times. The results are tabulated below . test whether the binomial distribution is a good fit.

Heads	0	1	2	3	4	5
Tosses	25	40	43	15	4	1

SECTION-E
Answer any two of the following questions:-   2x5=10

41. Average IQ of a group of 800 children is 98. The standard deviation is 8. Assuming normality the expected number of children having IQ

      i) less than 96
      ii) between 100 and 120

42. Of the 500 workers in a factory exposed to an epidemic 350 all were attacked, 200 had been inoculated and of these 100 were attacked . Test whether innoculation and attack are independent.

43. The proportion of sub standard crackers among 400 crackers , manufactured by a firm A is 0.12. The proportion among 500 crackers manufactured by firm B is 0.08. Test at 1% level of significance the proportion is greater for firm B

44. The demand for an item is 125 per month. Inventory holding cost is `1.2 per unit per year. Shortage cost is `2.40 per unit per year. Ordering cost is 200 per order. Assuming instantaeneous replenishment determine the optimum order quantity and Maximum Shortage Level.

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