Date: *SUBJECT: STATISTICS*

II PUC
Mock paper I

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: **1X10=10**
1. Define vital statistics.

2. Which index number is used in fixation of salary to government employees

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. Write the range of Hypergeometric distribution

6. If the S.D of a poisson distribution is 2,then find its variance

7. What is alternative hypothesis?

8. Define critical value

9. Define confidence co-efficient

10. Which type of 'variation of causes' is detected by S.Q.C.

11. When do you say that the T.P is balanced

12. What is pure strategy of a game?

SECTION-B

II. Answer any Ten of the following: **1X2=20**
13. Explain briefly the registration method of collection of vital statistics

14. State any two limitations of Index Numbers

15. Why Fisher's Index number is called ideal?

16. Write down the normal equation for fitting linear trend

17. Write down the condition for application of Binomial expansion method

   of Interpolation.

18. Write down the Bernoulli distribution with parameter P=0.23

19. In a poisson distribution, the first two frequencies are 100 and 120 Respectively. Find the

   next frequency term.

20. Define sample space and parameter space.

21. The proportion of vegetarians in village A is 0.42.The proportion of vegetarians in village B is 0.37.Among 70 randomly selected people from village A. if P_1 is the proportion of vegetarians and among 60 randomly selected people from village B if P_2 is the preparation of vegetarians. Find the standard error of $(P_1 - P_2)$.

22. Mention two disadvantages of acceptance sampling plan

23. Mention the two areas of economic, industrial areas where operations research can be Applied.

24. In a linear programming problem define a feasible solution

SECTION-C

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

25. Find the total fertility for the following data

Age group(yrs)	15-19	20-24	25-29	30-34	35-39	40-44	45-49
No.of live births	840	1350	2800	1200	1040	500	120
Women popl	14000	15000	14000	13000	12000	11000	10000

26. From the following data compute weighted geometric mean price index number

Item	A	B	C	D	E
2008 price	80	120	100	120	80
2012 price	120	150	80	90	100
Weights	3	2	2	1	2

27. Compute the consumer price index number by aggregative expenditure method

Items	Price (Rs)		Expenditure
	2005 (100)	2010	
Rice	16	22	320
Wheat	12	18	96
Pulse	20	35	40
Sugar	17	20	85
Oil	50	55	150
Salt	10	8	30
Clothing	40	20	160
Fuel	200	380	200
Housing Rent	1500	2500	3000
Others	2200	3000	17000

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(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. Assuming that birth to male and female to be equally likely. Find the probability that a family with 4 children will have 1)Three or more daughters ii) No daughters.

31. A pond has 20 fishes of which 8 are red and remaining are white. Four fish are caught .Find the mean and variance of the number of fishes caught.

32. A certain brand soap is known to have weights with variance 25.A random sample of 256 soaps had mean weight 122gms .Can we conclude that the mean weight of the soaps manufacture by the firm is 125gms?

33. Following is the data regarding the family conditions and examination results of 100 students .Test whether result depends on family condition

Family conditions	Examination Result		
	Pass	Fail	Total
Good	30	10	40
Bad	20	40	60
Total	50	50	100

34. For the following data, find the control limits for -chart (Given A_2 =0.577)

Subgroup No.	1	2	3	4	5	6
Mean	52	48	53	49	50	48
Range	10	11	8	12	9	

35. From the following pay-off matrix of player A, solve the game by maximin-minimax principle

		Player B			
		B_1	B_2	B_3	B_4
Player A	A_1	3	2	1	6
	A_2	3	1	0	4
	A_3	3	4	-3	0

36. Solve the following linear programming problem by graphical method

Max Z=20x+50y

Subject to constraints: 6x+3y ≤ 180

4x +8y ≥ 160 and x, y ≥ 0

SECTION-D

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

37. The following gives the age and sex distribution and the live births occurring in a

population. Compute CBR and GRR and ASFR.

Age	Men population	Women population	No. of live births
0-14	10730	9840	0
15-19	8400	7900	212
20-24	9980	9910	657
25-29	7400	7310	592
30-39	7360	7120	182
40-49	7300	6910	37
50 and above	6000	5860	0

38. Show that Marshall-Edgeworth's index number satisfies TRT and fishers 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. Below are given the figures of production (in 000's Q +1s) of a sugar factory.

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

i)   Fit a straight line trend to this figures.

ii)   Compute the trend values.

iii)   Estimate the production for the year 2004.

40. Fit Poisson distribution to the following data.

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

Test whether the poisson distribution is good fit.

SECTION –E

V.Answer any two of the following questions: 2 X 5=10

41. X is normal variate with mean 64 and variance 144 determine (i) P (X >67) (ii) P(60< X <66).

42. In a random sample of 1000 persons, from town A 400 are found to be non-Vegetarians. In a sample of 200 from town B 400 are Non-Vegetarians do this data revile that there is a significant difference in the proportion of Non-vegetarians in the two towns.

43. The tensile strength of 8 rods were 8.3, 12, 14, 7, 13, 9, and 6 tons. Test the hypothesise the variance of tensile strength is more that 4 tons.

44. There is demand for 5000 items per year. The replenishment cost Rs.100 and the maintenance cost Rs.10 per item per year. Replenishment is instantaneous and shortages are not allowed find. i) Optimal lot size ii) optimal number of orders iii) minimum annual average inventory cost.

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