JAIN COLLEGE

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SUBJECT: STATISTICS

II PUC
MOCK - II

Timings Allowed: 3 Hrs 15 Minutes ***Total Marks: 100***

Instructions: i) Graph sheets and statistical tables will be supplied on request.
ii) Scientific calculators
iii) All working steps should be clearly shown.

I.Answer the following questions: **10X1=10**

1. What is a life table?
2. Define an Index number.
3. Write the formula for 'Factor reversal test' index Number.
4. Give a difference between 'Cyclical' and 'irregular' variation in a time series.
5. Write the 'probability mass function' of a Bernoulli distribution with range.
6. In a normal distribution, given $P(-0.8<Z<0.8)=0.5762$. Find $p(Z>0.8)$.
7. What is 'Standard error'?
8. Given $H_1:\mu_1<\mu_2$ then, write H_0.
9. What is an 'Inventory'?
10. Write a merit of 'acceptance sampling' in statistical quality control.

II.Answer any ten of the following: **10X2=20**

11. Briefly explain "Registration method " in vital statistics.
12. Calculate consumer price index number using "Family budget method"from the following data:

Items	A	B	C	D
Group Indices	102	97	108	110
Weights	8	6	12	4

13. Find V_{01} given $\sum P_0q_0=382$ and $\sum P_1q_1=424$.
14. Write any two merits of 'Least square method'.
15. Mention two features of poisson distribution.
16. In a normal distribution,given variance is $9cm^2$,find 'Quartile deviation'.
17. Define 'parameter' and 'Statistic'.
18. Calculate standard error (p_1-p_2):

Given,$p_1=0.86$,$p_2=0.9$

$N_1=40$ and $n_2=38$.

19. In a Chi-square distribution if n=6, find 'mode' and 'Variance'.
20. Mention two characteristics of a 'Competitive Game'.

21. CalculateE.O.Q.given D=5000 units/month.

C_1=Rs.10/month and C_3=Rs.200/month.

22.Write the upper and lower control limits for X-Chart, when standard are not given.

SECTION-C

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

23. Calculate 'Total Fertility rate' for the following data:

Age goup(in years)	Male population	Female population	Number of live births
<15	8000	7500	-
15-20	7800	7300	20
20-25	7000	6800	180
25-30	6600	6000	260
30-35	5400	5600	200
40-45	3200	4100	05
>	2100	2800	-

24. Explain steps involved in the construction of 'Consumer price index number'.

25. Calculate p_{01} by simple average of price relative's method using 'Geometric mean' from the following data:

Itema	I	2	3	4	5
Price in 2008	26	32	18	12	40
Price in 2010	28	30	20	12	45

26. Obtain trend values by 5 weekly moving averages method for the following time series. Plot original and trend value on a graph.

Weeks	1	2	3	4	5	6	7	8	9
Production	15	16	18	18	20	19	22	24	25

27. On an average the number of defective items in a box is 2.If there are 100 such boxes,in how many of them would you expect at least two defective items?

28. Weightsof students of a college are normally distributed with mean 45kgs and S.D.5kgs.Find the probability that a randomly selected student has weight

(i) greater than 50 kgs (II)Less than 42 kgs.

29. Among 500 randomly selected persons of a city, 260 were coffee drinkers. Test at 5% level of the significance that less than 53% of the population in the city drinks coffee.

30. Following are the points scored by five students in a competition:

1,13,9,5,7 Test at 5% level of significance that the population variance is more than 15.

31. Mean and standard deviation of heights of two localities regarding persons gave the following results:

Sample	Locality-A	Locality-B
Size	12	8
Mean (cms)	12	8
S.D(cms)	4.2	

Can we conclude at 5% level of significance that the population of a locality-A an average are shorter than Locality-B.

32.Solve the following game using minimax-maximinprinciple.Is the game fair?

	A	B	C
P	1	-1	3
A	2	-1	2
R	-1	0	0
S	2	0	4

33. A firm is considering replacement of a machine whose purchase price is RS.5000.It resale value and running costs for successive year are given below:

Year	1	2	3	4	5	6	7	8
Running cost	1500	1600	1800	2100	2500	2900	3400	4000
Resale cost	3500	2500	1700	1200	800	500	500	500

Suggest the optimal replacement period.

34.Ten samples of 100 each of P.V.C.pipes manufactured by a firm are inspected for the number of defectives. The number of pipes having defects are noted as below:2,1,3,0,2,2,4,4,5,6.

Calculate control limits for np-Charts.

SECTION-D

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

35. For the following data, compute Standardized death rates and hence comment:

Age (Years)	Village A		Village B		Standard population
	Population	Deaths	Population	Deaths	
0-10	600	18	400	16	500
10-20	1000	100	15000	6	1200
20-60	3000	24	2400	24	2500
60-100	400	20	700	21	500

36. Construct Fisher's Index Number for the following data. Test whether it satisfies 'Time Reversal Test' and 'Factor reversal Test'.

Age(Years)	Base year		Current year	
	Price	Quantity	Price	Quantity
A	7	70	9	99
B	9	81	11	10
C	15	225	20	110
D	20	300	25	350

37. Fit a second degree equation of the form $Y=a+bx+cx^2$, to the following data regarding profits and estimate the profit for the year 1990:

Year	1985	1986	1987	1988	1989
Profits	10	12	13	10	8

38. The following data were obtained for the number of defective items for a sample of size 5 for 500 sample during a week:

No.of defective items	0	1	2	3	4	5
No.of samples	170	180	120	20	8	2

Test at 5% level of significance that the Binomial distribution is a good fit.

SECTION-E

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

39.If X is normally distributed with mean 50 and Variance 25,then find (i)P(X≤48)

(II)p(X≥54).

40.It is required to test whether those who practice Yoga have average blood sugar less than 120.A sample consisting of 35 persons who Practice Yoga is observed. If their mean sugar is 114 and S.D. is 8, what would you conclude?

(Use 5% level of significance)

41. Following is the data regarding five students administered for an I.Q.test before and after treatment of Yoga:

IQ Before	118	120	116	115	125
IQ After	125	118	125	120	130

Is treatment effective?(Use 5% level of significance)

42. There is a demand for 8000 items per year. The ordering cost is Rs.200 and carrying cost is Rs.10 per item per year. Then find (i) EOQ (II) the minimum average inventory cost.

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