JAIN COLLEGE

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SUBJECT: STATISTICS

II PUC
MOCK - I

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.

SECTION-A

I. Answer any TEN of the following questions: **10X1=10**

1. Define a radix.
2. Write down the expression for Kelly's fixed weight price index number.
3. Mention a use of cost of living index number.
4. Is mean of binomial distribution less than variance?
5. Give an example for irregular variation in time series.
6. What is the standard deviation of standard normal variate.
7. What is level of significance?
8. In a normal distribution, given $p(-0.8<Z<0.8)=0.5762$.find $P(0<Z<0.8)$.
9. For an unbounded solution, what kind of objective function can be optimized?
10. Name the distribution in which mean and variance are equal.
11. What is Longevity?
12. How many d.f are there in testing of goodness of fit?

SECTION-B

II. Answer any TEN of the following questions: **2X10=20.**

13. Mention any two mortality rates.
14. Why Fisher's index no is called 'Ideal index number'.
15. Write down the formulae for mean and variance of hyper geometric distribution.
16. In a Poisson distribution the first probability term is 0.2725.find the next probability term.
17. Write down any two properties of normal distribution.
18. What is an optimal solution?
19. If $E(X_1-X_2)=2.7$ and $SE(X_1-X_2)=1.3$. What would you conclude at 5% level of significance for right? tailed test?
20. Find the mean and mode of a chi-square distribution with 7 degrees of freedom.
21. Write any two merits of 'Least square method'.
22. Explain about Asymptoticness of normal curve.
23. Write down the formula of binomial expansion method for 4 and 5 known values of 'y'.
24. Mention two disadvantages of acceptance sampling plan.

SECTION-C

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

25. There are 50 lecturers in a college. Out of them,23 belong to the science faculty. The college management builds 5 quarters and allots them to 5 randomly selected lectures. Find the probability that All the quarters are allotted to science lecturers.

26. Vijay company manufactures two varieties A and B of pens. each variety pen of A needs two hours labor. Each B variety pens needs one hour labor. Total labor availability is 500 hours per month. The demand for a variety pen is 150 per month. the demand for B variety pen is 250 per month. The profit that two varieties fetch are RS 8 and RS 5 per pen. Formulate an LPP.

27. Calculate total fertility rate from the following data.

Age groups	Male population	Female population	Number of live biths
<15	8000	7500	-
15-20	7800	7300	20
20-25	7000	6800	180
25-30	6600	6000	260
30-35	5400	5600	200
35-40	4800	5000	80
40-45	3200	4100	5
>	2100	2800	-

28. Explain a) Time Reversal Test b) Factor reversal Test.

29. In the following table the values of X represent the degrees of freedom and the Y values represents Critical values at 5% level of significance. Find the missing values by using binomial expansion method.

X	2	3	4	5	6	7	8
Y	5.99	7.81	9.49	-	12.59	14.07	-

30. Heights of 360 children are normally distributed with mean 120cms and variance 4cm^2.Find the expected number of children having height (i) greater than 118cms.(ii)between 116cms and 119cms. (iii) less than 117 cms.

31. Find an Allocation of available sources by MMM and compute the transportation cost. Is the solution degenerate?

	X	Y	Z	Availability
A	8	7	3	60
B	3	8	9	70
C	11	3	5	80
Requirement	50	80	80	210

32.A bulb manufacturing company manufactures bulbs in a sample of size 50 each. The result of the first 50 samples showed that 60 bulbs Were defective. Calculate control limits for np or d charts.

33. In a normal distribution 31% of the items are under 45 and 8% of the items are over 64.Find the mean and S.D. of the distribution.

34. The following are the maintenance and depreciation costs per year of a truck whose purchase price is Rs.50000 .

Years	1	2	3	4	5	6	7
Depreciation cost	18000	33000	40500	44200	46000	46000	46000
Maintenance cost	4500	5500	6500	8500	11000	15500	17500

When should be the truck replaced?

35. Calculate P_{01} by simple average of price relative method using 'Geometric mean' and 'Arithmetic mean' from the following data.

Items	A	B	C	D	E
Prices in 2008	26	32	18	12	40
Prices in 2010	28	30	20	12	45

36. Max.Z=20X+10Y
S.T.X+Y≥50
20X+40Y≤800
And X,Y≥0

SECTION-D

IV.Answer any TWO of the following question: 2X10=20

37. From the data given below, calculate the GRR and NRR

Age group(in yrs)	Female population	Female live births	Survival rate
15-19	1390000	15133	0.9694
20-24	1422000	941555	0.9663
25-29	1521000	102676	0.9632
30-34	1756000	72490	0.9584
35-39	1451000	31402	0.9519
40-44	1689000	10640	0.9424
45-49	1667000	700	0.9279

38.It is stated that Marshall-Edgeworth index number is a good approximation to the Fisher's ideal Index number. Verify this using the following data.

Article	P_0	q_o	P_1	q_1
A	10	6	15	5
B	12	10	15	10
C	18	5	27	3
D	8	5	12	4

39. Production figures of a sugar factory in 1000 quintals are given below:

Year	1998	2000	2002	2004	2006	2008	2010
Production	12	10	14	11	13	15	16

a. Fit a straight line trend to the above data.
b. Plot these figures on a graph and show the trend line.
c. Estimate the production for 2012.

40 .The following table gives the no.of deaths per day in a hospital for 400days. Fit a poisson distribution And obtain the theoretical frequencies for the data.

No.of deaths per day	0	1	2	3	4	5	6	7 or more
No.of days	68	134	127	43	19	7	2	0

SECTION-E

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

41. 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.

42.A lot contains 2% defective items.40 items chosen from it. Another lot contains 1% defective items.60 chosen from it. Find $E(p_1-p_2)$ and $S.E(p_1-p_2)$.

43The following table gives the number of defectives found during inspection of 8 samples of size 100 each. Find the suitable control limits.

Sample no.	1	2	3	4	5	6	7	8
No.of defectives	1	3	2	2	1	0	2	1

44. Ten students are selected at random from a college and their heights are found to be 100,104,110,118,120,122,124,126 and 128 cms. Test at 5% level of significance that the average height of the students of the college is 110cms.

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