



JAIN COLLEGE

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Bangalore - 560 098

Date:

SUBJECT: STATISTICS

**II PUC
MOCK PAPER I**

Timings Allowed: 3Hrs 15 Minutes.

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 all the following questions.

10×1=10

1. Define cohort.
2. What is the value of index number for the base year?
3. Mention any one factor causing seasonal variation.
4. What is time series?
5. Give the condition under which Poisson distribution tends to Normal distribution.
6. In a Binomial distribution if $n=7$ and $p=0.7$ find standard deviation.
7. Define critical region.
8. What is interval estimation?
9. What is meant by multiple solution in LPP?
10. When is a transportation problem balanced?
11. What is meant by defects?
12. Which type of variation can be detected with the help of statistical quality control?

SECTION-B

II. Answer all the following questions.

10×2=10

13. Mention the methods of collecting vital statistics.
14. The female population of child bearing age group in a region is 1,85,000. The number of live births in the year in the region is 3400. Find GFR.
15. Write any two limitations of Index Number.
16. Diagrammatically represent 'Business cycle' with stages.
17. State any two differences between Moving Average and Least squares methods of obtaining trend values.
18. Define Interpolation and Extrapolation.
19. Define Point estimation and interval estimation.
20. The First and Second Quartile of a Normal Distribution are 38 and 50 respectively. Find upper quartile.
21. What do you mean by Process control and Product control?
22. Mention any two advantages of 'Acceptance Sampling Plan'.
23. Given $R=1800/\text{year}$, $C_3=300$, $C_1=2/\text{Unit}/\text{year}$, find the optimum lot size of an inventory.
24. The objective function and two solutions of an LPP are $\text{Max}Z=5X+4Y$ and $A(12,10);B(14,4)$. Find the optimal solution.

SECTION-C

III. Answer all the following questions.

8×5=40

25. Compute TFR from the following data

Age(in years)	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Female Population	48000	50500	46000	44000	40000	40000	30000
No. of births	1250	7430	7900	5500	1390	500	50

26 .What is Consumer Price Index Number(CPI). Write its Four uses.

27. Compute Kelly's price index number for the following data.

Group	Price(in Rupees)		Quantity
	Base year	Current year	
A	120	150	75
B	60	80	30
C	90	110	20
D	36	65	25
E	40	70	10
F	52	65	22

28. Find trend values of the following time series by three yearly moving average method.

Year	2001	2002	2003	2004	2005	2006	2007
Values	2.65	3.5	3.75	4.2	4.8	5.1	5

29. The number of accidents in a year attributed to taxi drivers in a city follows Poisson Distribution with mean 2.5 .Out of 2000 taxi drivers ,find approximately the number of drivers with

- a)One accident b) More than 2 accidents in a year.

30. In a Hyper Geometric distribution if $a=6, b=9$ and $n=4$ then find

- a) $P(X=2)$
b)Standard deviation.

31. Following is the data regarding mean weights of randomly selected boys and girls of PUC students .Test whether , mean weight of boys is less than mean weight of girls [Use 5% L.O.S]

Sample	Boys	Girls
Size	64	48
Mean	50kg	54kg
S.D	8kg	12kg

32. In an election the leaders of a party contend that they would secure more than 36% of votes. A pre-poll survey of 400 voters revealed that the percentage is 42. Does the survey support the leader's claim? [Use 5%L.O.S].

33. Solve the following LPP graphically

$$\text{Max } Z=5x+4y$$

$$\text{S.t } 4x+y \geq 40$$

$$2x+3y \geq 60$$

$$\text{And } x,y \geq 0$$

34. Given: $D_3=0$, $D_4=2.115$ and $\bar{R}=4$, Draw R-chart for the following data:

Sub-groups	1	2	3	4	5	6
R_1	3	5	5	3	6	2

35. The capital cost of a machine is Rs.10,500. Its resale value is Rs.500. The maintenance costs are as follows.

Age(years)	1	2	3	4	5	6
Maintenance cost(in Rs.)	800	1000	1500	2200	2800	3900

36. For the following Transportation problem, obtain the initial basic feasible solution by NWCR method. Is the solution degenerate?

		Warehouse			Availability
		I	II	III	
Factory	A	2	17	27	5
	B	3	4	9	8
	C	5	9	7	7
	D	1	6	2	14
Requirements	7	9	18		

SECTION-D

IV. Answer all the following questions.

2x10=20

37. For the following two villages compute standardized death rates and comment.

Age(in years)	Standard population	Village A		Village B	
		Population	Deaths	Population	Deaths
0-20	20,000	8,000	128	4,000	72
20-50	30,000	13,000	65	9,000	54
50-70	35,000	10,000	140	7,000	98
70& above	15,000	4,000	252	3,000	129

38. Verify whether Marshall-Edgeworth's index number satisfies Time Reversal Test.

Items	2002		2006	
	Price(Rs.)	Value(Rs.)	Quantity consumed	Value(Rs.)
A	10	1500	160	1760
B	12	1080	100	1300
C	15	900	60	960
D	9	450	40	480

39. Fit a parabolic trend to the following time series and estimate the profit for the year 2007.

Year	1998	1999	2000	2001	2002	2003	2004
Profit	50	60	55	61	72	73	75

40. Fit a Poisson distribution to the data and test for goodness of fit

x	0	1	2	3	4	5	6	7
f	364	376	218	89	33	13	2	1

SECTION-E

IV. Answer all the following questions.

2x5=10

41. The mean yield for one acre plot is 662 kilos with standard deviation 32 kilos. Assuming Normal Distribution, how many one acre plots in a batch of 1000 plots would you expect to have yield i) more than 700 kilos ii) below 650 kilos.

42. Graphically solve the following LPP

Minimize $Z=50x+30y$

Subject to $5x+4y\geq 40$

$2x+5y\geq 10$

And $x\geq 0, y\geq 0$

43. I.Q. of 5 students before and after training are given below:

Student	1	2	3	4	5
Before training	122	126	105	132	111
After training	117	118	123	133	105

44. 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