



SRI BHAGAWAN MAHAVEER JAIN COLLEGE

Vishweshwarapuram, Bangalore.

II PUC MOCK QUESTION PAPERS - 1

Course: II PUC

Subject: Statistics

Max. Marks: 100

Duration: 3:00 Hrs 15 Mins

Instructions

1. Statistical table and Graph sheets will be supplied on request.
2. Scientific calculator are allowed
3. All working steps should be clearly shown.
4. Section A should be written in the beginning of the answer booklet.

SECTION A

I. Choose the correct answer from the choice given **(5 × 1 = 5)**

1. Average population of a town in a year was 100000 and number of deaths occurred was 6000.
The crude death rate is _____
a) 0.06 b) 600 c) 60 d) 0.65
2. Paasche's index number is expected to have _____
a) an upward bias b) an downward bias c) no bias d) none of these
3. The parameter of 't' distribution is _____
a) n b) p c) q d) n , q
4. A statistical constant of the population is called _____
a) standard error b) a statistic c) point estimation d) a parameter
5. In replacement theory, the depreciation cost of an item is _____
a) $S_n - P$ b) $P + S_n$ c) $S_n - P$ d) $P - S_n$

II. Match the following.

(5 × 1 = 5)

6.
 - I. 15 – 49 years a) Cost of living index number
 - II. Retail price b) Size of the test
 - III. Standard normal distribution c) Germination period
 - IV. $P(\text{Reject } H_0 \text{ when it is true})$ d) C_1
 - V. Storage cost e) Variance = Standard deviation

III. Fill in the blanks by choosing the appropriate word from those given in the brackets **(5 × 1 = 5)**

(Defective, 13 , GM , Saddle point , Null distribution)

7. In the computation of index numbers. Most preferred type of average is _____
8. In a Chi-square distribution with 15 d.f, the mode is _____
9. The statistical distribution of the test statistic under the null hypothesis is called _____
10. An item having one or more defect is a _____ item.
11. The position of the pay – off matrix where maximin and minimax coincide is the _____

IV. Answer the following question

(5 × 1 = 5)

12. Define mortality ratio.
13. Which weights are used in the construction Laspeyre's quantity index number?
14. Which index is used for measurement of seasonal variations?

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15. If $p = 1/2$ for a Bernoulli distribution, write its pmf.
16. Mention one advantage of inventory.

SECTION B

V. Answer any five of the following questions.

(5 × 2 = 10)

17. State two norms for the section of the base year.
18. Diagrammatically represent 'Business cycle' with stages.
19. Write down the two assumptions of interpolation and extrapolation.
20. The mean and S.D of a Binomial distribution are 4 and $\sqrt{2}$ respectively. Find the parameter.
21. Write down two uses of standard error.
22. A lot contains 3% defective items. 50 items chosen from it. Another lot contains 2 % defective items. 60 items chosen from it. Find S.E ($p_1 - p_2$).
23. Define process control and product control.
24. Verify whether the following solution is non-degenerate.

-	5	-	6
-	-	2	-
2	-	-	1

SECTION - C

VI. Answer any EIGHT of the following questions.

(8 × 5 = 40)

25. Calculate total fertility rate for the following data. Also calculate the average number of children born to woman of child bearing age.

Age (years)	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Female population	1000	2500	3000	2200	800	400	100
Live births	60	200	390	110	40	10	-

26. Define index number and mention four uses of index number.
27. From the following data calculate weighted Geometric mean index number.

Items	A	B	C	D	E
Prices in 2018	26	42	20	16	50
Prices in 2020	29	40	24	16	60

28. For the following time series compute trend values by five yearly moving averages and comment.

Year	2016	1996	1998	2000	2002	2004	2006	2008	2010	2012	2014
Sales ('000)	21	13.6	15	16.8	16.8	17	17.6	16.8	18.3	19.6	20.1

29. Using Newton's forward difference method interpolate the number of persons living in the age of 25 years.

Age(years)	10	20	30	40	50
Number of persons	55	48	39	26	7

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30. The number of accidents in a year attributed to taxi drivers in a city follows Poisson distribution with mean 2.5, out of 1000 taxi drivers, find approximately the number of drivers with
 (i) one accident in a year
 (ii) more than three accidents in a year
31. A basket has 15 mangoes, out of which 9 are ripe. 4 mangoes are randomly selected.
 i. what is the probability that all the picked mangoes are ripe?
 ii. find the expected number of ripe mangoes among the picked ones
32. It is required to test whether those who practice Yoga have average blood sugar less than 120 mg/dl. A sample consisting of 36 persons who practice Yoga is observed. If their mean blood sugar is 118.5 mg/dl and variance is 9 mg²/dl. At 1% level of significance what would you conclude?
33. In an experiment of immunization of cattle for tuberculosis, the following results were obtained.

	Affected	Unaffected
Inoculated	12	26
Non-inoculated	16	6

Test whether the vaccine is effective in controlling tuberculosis. Use $\alpha = 0.05$

34. Given, $n = 5$ and $R_i : 6, 3, 8, 4, 1, 2, 5$ and 7. Find the control limits of Range.
35. Solve the following L.P.P graphically:
 Min. $Z = 5x + 4y$
 s.t. $4x + y \geq 40$
 $2x + 3y \geq 60$
 and $x, y \geq 0$

For Visually Challenged Students

Write the procedure of solving an L.P.P by graphical method.

36. Solve the following game by dominance property. Is the game fair?

		Player B			
		B1	B2	B3	B4
Player A	A1	4	2	0	5
	A2	-1	-2	0	-3
	A3	-3	1	-3	0

SECTION -D

VII. Answer any TWO of the following questions

(2 x 10 = 20)

37. From the following data, compute standardized death rates and comment.

Age group [in years]	Locality A		Locality B [Standard]	
	Population	Deaths	Population	Deaths
0 – 20	3,000	45	4,000	40
20 – 40	8,000	48	10,000	60
40 – 60	7,000	42	10,000	70
60 & Above	5,000	110	6,000	108

38. Construct Paasche's, Marshall-Edgeworth's and Fisher's quantity index numbers from the following data.

Item	Base year		Current year	
	Price	Quantity	Price	Quantity
A	40	2	50	3
B	20	3	30	3
C	30	6	30	8
D	80	5	100	6

39. The sales of a company for the years 2006 to 2012 are given below:

Year	2010	2012	2014	2016	2018	2020	2022
Profit('00)	32	47	65	92	132	190	275

Estimate sales figures for the year 2024. Using the form $y = ab^x$.

40. a) Five unbiased coins are tossed 256 times. Find the theoretical frequencies for the number of tails obtained.
- b) The standard deviation of production of paddy is assumed to be 10.6 tons. A sample of 20 acres showed that the standard deviation is 8.3 tons. Test at 1% level of significance whether the standard deviation of production of paddy is less than 10.6 tons.

SECTION -E

VIII. Answer any TWO of the following questions.

(2 × 5 = 10)

41. Bengaluru corporation authorities have installed 2000 electric lamps in MG road. The lamps have an average life of 1000 burning hours with a S.D of 200 hours. If life of lamps follow normal distribution, then what number of lamps might be expected to fail in the
- (i) more than 800 burning hours?
 - (ii) between 900 hours and 1200 hours.
42. Among 80 randomly selected persons from district A, 36 are interested in viewing hockey match. Among 40 randomly selected persons from district B, 12 are interested in viewing hockey match. Test at 1% level of significance that, the proportion of viewers in district B is more than district A.
43. Eleven students were given intensive coaching and 2 tests were conducted before and after coaching. The score of 2 tests are given below. Do the scores before and after coaching shows an improvement?

Before coaching	31	34	34	29	26	32	35	38	34	29	32
After coaching	26	24	28	30	29	32	26	35	29	32	28

44. There is demand for 8000 items / year. The replenishment cost is 100 and the maintenance cost Rs. 2 / item / year. Replenishment is instantaneous and shortages are not allowed. Find (i) EOQ
- (ii) Minimum average cost
 - (iii) Frequency of replenishment

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