



SRI BHAGAWAN MAHAVEER JAIN COLLEGE
Vishweshwarapuram, Bangalore 560004
Mock Examination Question Paper-2 (January 2019)

Course:	II PUC
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Subject:	Statistics
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Max. Marks:	100
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Duration:	3:15 hrs.
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Instructions:

Do not write or mark anything on the question paper

- i) All working steps should be shown clearly.
- ii) Scientific calculators may be used.
- iii) Statistical tables and graph sheets will be supplied on request

SECTION-A

I. Answer any TEN of the following questions.

10x1=10

1. Define general fertility rate.
2. What is price relative?
3. State the relation between Laspeyre's, Paasche's and Fisher's indices.
4. Which component of time series is associated with deaths due to Tsunami?
5. What are the values of p and q of Bernoulli distribution, if an unbiased coin is tossed once?
6. In a Poisson distribution, if $P(x=0) = 0.0408$, find λ .
7. Mention the recurrence relation for successive frequencies in a Binomial distribution with parameters ' n ' and ' p '.
8. What is sample space?
9. What is statistical hypothesis?
10. Write any one type of cause for variation in a manufacturing process.
11. Define optimal solution in a transportation problem.
12. What is time horizon?

SECTION-B

II. Answer any TEN of the following questions.

10x2=20

13. Mention any two uses of Vital Statistics.
14. Explain unit test?
15. Quantity index number of current year is 250. If the number of units produced in the current year is 120 then find the number of units produced in the current year.
16. Write down the normal equations for fitting linear trend.

17. Write the formula for Newton's method.
18. In a Binomial distribution , if $n=6$ and $p = \frac{1}{3}$, find mean.
19. If $Q_1 = 30$ and $Q_3 = 70$, find median of normal distribution.
20. Write the values of σ_1 and σ_2 in a t-distribution.
21. Define size of the test and power of a test.
22. Mention any two stages of production process.
23. Find the value of the game for the following. Is the game fair?

$\begin{matrix} \square \\ 7 \\ \square \\ \square \\ 0 \end{matrix}$	$\begin{matrix} 2 \\ \square \\ \square \\ 1 \\ \square \end{matrix}$
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24. If the depreciation cost and the cumulative maintenance cost for an equipment for the third year is Rs. 8,000/- and Rs. 4,200/- respectively. Find the annual average cost.

SECTION-C

III. Answer any EIGHT of the following questions.

8x5=40

25. Compute Total fertility rate from the following data.

Age(in year)	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. Explain briefly the steps involved in the construction of cost of living index number.
27. Calculate Kelly's price index number for the following data and comment on the result.

Item	Price (Rs.)		Quantity
	2010	2011	
A	14	15	5
B	22	24	4
C	10	12	10
D	8	10	12

28. Estimate the trend values using the data given below by taking four yearly moving average.

Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Values	12	25	39	54	70	87	105	100	82	65

29. Interpolate the business in 2014 and extrapolate for the year 2016 from the following data.

Years	2010	2011	2012	2013	2014	2015	2016
Business (in lakhs)	80	150	235	365	-	780	-

30. The probability of a thermometer manufactured by a firm found to be defective is 0.03. Find the probability that a box containing 60 thermometers contain no defective ones. Among 1000 such boxes, how many contain exactly 3 defective thermometers?
31. In hyper geometric distribution , if $a = 6$, $b = 9$ and $n = 4$ then find
a) $P(X=2)$ b) Standard deviation
32. A company states that it sells 5600 articles in a month but an inspector feels that it is not 5600. He randomly selects 17 months and finds that on an average the sales are 5750 and S.D. is 175. Conduct the test at 5% level of significance.

33. Heights (in cm) of 10 students in a village are as follows: 143, 140, 150, 152, 148, 145, 156, 151, 149, 146. Test at 1% level of significance whether the population variance is 9cm^2 .
34. Calculate the control limits for R-chart for the following data given $n=5$.

Sample number	1	2	3	4	5	6
Range	3	4	8	5	3	7

35. Graphically solve the following LPP.

$$\text{Max } Z = 3X + 5Y$$

$$\text{subject to } X + 2Y \leq 200$$

$$Y \leq 60$$

$$\text{and } X, Y \geq 0$$

OR

(For visually challenged)

Explain the steps involved in the construction of LPP.

36. Find the initial basic feasible solution to the following transportation problem by NWCR method and find transportation cost to this solution.

		Destination			
		D1	D2	D3	Availability
Origin	O1	8	4	12	500
	O2	10	5	6	300
	O3	7	5	3	200
Requirement		400	300	300	1000

SECTION-D

IV. Answer any TWO of the following questions.

2x10=20

- 37a. From the following data show that Town 'B' is healthier.

Age (in years)	Death rates		Standard population
	Town A	Town B	
Below 10	18	12	15000
10 – 20	6	4	18000
20 – 50	8	8	22000

50 – 70	10	9	12000
70 and above	80	90	8000

37b. From the data given below calculate NRR and comment.

Age (in years)	Female population	Female live birth	Survival rate
15 – 19	139000	15133	0.9694
20 – 24	1422000	94155	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. For the following data find Laspeyzer's, Paasche's and Fisher's price index numbers.

Item	Base year		Current year	
	Price	Quantity	Price	Quantity
A	10	5	12	4
B	15	8	18	7
C	6	3	4	5
D	3	4	3	5

39. For the following time series data , fit a curve of the type $Y = a + bx + cx^2$. Estimate the value for the year 2011.

Year	2004	2005	2006	2007	2008	2009	2010
Value	14	16	20	28	42	61	81

40. Five coins are tossed 250 times and the following distribution is obtained

Number of tails	0	1	2	3	4	5
Number of tosses	29	37	45	62	50	27

Fit a Binomial distribution to the data and test the goodness of fit at 1% level of significance.

SECTION-E
(Practical Oriented Questions)

V. Answer any TWO of the following questions.

2x5=10

41. Heights of PU students is normally distributed with mean 155 cm. and standard deviation 5cm. Find the i) probability that a randomly selected PU student has height more than 155cm.
ii) percentage of PU students having height between 150 cm and 160 cm.
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 5% level of significance that, the proportion of views in district A is more than district B.
43. In a survey of 200 boys of which 75 were intelligent and out of these of three intelligent boys, 40 had skilled fathers, while 85 of the unintelligent boys had unskilled fathers. Do these figures support the hypothesis that skilled fathers have intelligent boys.
44. The demand for an item is 40 units/month. Capital cost is Rs. 5 per unit. Inventory carrying cost is 10% of capital cost per annum. If the set up cost is Rs.100 and stock out cost is Rs. 3per unit/year. Find economic order quantity and minimum average cost.

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