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FOR KARNATAKA CLASS 12 PREPARATION

Karnataka 2nd PUC Model Question Paper 2027 for Statistics (Paper 5)

EXAM	YEAR	TYPE	SUBJECT
Karnataka Class 12	2027	Sample Paper	Statistics

GOVERNEMENT OF KARNATAKA
KARNATAKA SCHOOL EXAMINATION AND ASSEMENT BOARD
6th CROSS, MALLESHWARAM, BENGALURU-560 003
2026-27 II PUC MODEL QUESTION PAPER- 5

Subject: 31 - Statistics **Maximum Marks:** 80
Time: 3.00 Hours **No. of Questions:** 38

Instructions:
1. Statistical tables and graph sheets will be supplied on request.
2. Scientific calculators are allowed.
3. All working steps should be clearly shown.
4. For 'Section – A' questions, only the first written answers will be considered for evaluation.
5. For the question having graph, alternative question is given at the end of the question paper in a separate section for visually challenged students.

SECTION – A

I. Choose the most appropriate answer from the choices given: **(5 X 1 = 5)**

1) The probability of a person of age x years, will die before reaching age (x+1) years is
a) Longevity b) Mortality ratio c) Survival ratio d) Expectation of life

2) The weights used in the construction of Marshall-Edgeworth's price index number
a) $\frac{q_0+q_1}{2}$ b) q c) q_0 d) q_1

3) The variance of a Bernoulli distribution with parameter 'p' is
a) q b) npq c) np d) pq

4) Which of the following statements are correct?
(i) P(Type – I error) = α (ii) P(Type – I error) = 1 - α
(iii) P(Type – II error) = β (iv) P(Type – II error) = 1 – β
a) i and iii b) i and iv c) ii and iii d) ii and iv

5) The cost associated with the maintenance of an inventory until they are sold or used is
a) Capital cost b) Set-up cost c) Holding cost d) Shortage cost

II. Fill in the blanks by choosing the appropriate answers given in the brackets: **(5 X 1 = 5)**

(Standard normal, Defective, Ratios, An upper, Saddle, Poisson)

6) Index numbers are expressed in _____ but for comparison purpose they are expressed in percentages.

7) In _____ distribution, variance and standard deviation are equal.

8) Chi-square test for goodness of fit is always _____ tailed test.

9) An item having one or more defects is a _____ item.

10) The position of the pay-off matrix where maximin and minimax coincide is the _____ point.

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III. Match the following: **(5 X 1 = 5)**

11)

A	B
a. Maternal mortality	i. Free of bias
b. Fisher's index number	ii. 1 – P(Type – I error)
c. Chi-square distribution	iii. Puerperal deaths
d. Power of a test	iv. Mean equals to its parameter
e. North-west corner rule method	v. P(Type – I error)
	vi. Transportation problem

IV. Answer the following questions: **(5 X 1 = 5)**

12) Which birth rate is used to compare fertility rates of different populations?

13) What do you mean by historigram?

14) Under what condition Poisson distribution tends to normal distribution?

15) What is the best estimator of the population mean?

16) Write one of the disadvantages of inventory.

SECTION – B

V. Answer any FIVE of the following questions: **(5 X 2 = 10)**

17) Define random variation in a time series and give an example.

18) State two conditions for applying binomial expansion method of interpolation and extrapolation.

19) In a Poisson distribution, if standard deviation is 2, then find its mean.

20) Find the variance of chi-square distribution with 6 degrees of freedom.

21) If $\sigma = 4$ and $n = 64$, then find the standard error of sample mean.

22) Write two applications of t-test.

23) Name the control charts for variables.

24) Verify whether the following solution to a transportation problem is non-degenerate?

20	10	
3	6	
	15	5
	4	5
		5
		2

SECTION – C

VI. Answer any FOUR of the following questions: **(4 X 5 = 20)**

25) Calculate cost of living index number for the following data by using family budget method.

Group	Weight	Price (in Rs)	
		Base year	Current year
Food	30	2500	3125
Housing	20	2200	2420
Clothing	10	1800	2160
Fuel	15	2000	2600
Miscellaneous	25	2800	3920

26) Interpolate the value of 'Y' when X = 26 by using Newton's advancing difference method from the following data.

X	20	30	40	50
Y	72	202	557	1137

27) Team A has probability 0.4 of winning a game. If it plays 5 games, find the probability that it wins – (i) 4 games (ii) at least 2 games.

28) A box contains 7 pink and 5 blue marbles. From this box four marbles are drawn at random. Using hyper-geometric distribution, find the probability that the sample contains 2 pink marbles. Also find the expected number of pink marbles.

29) From a random sample of 100 students of PUC, 16 students were found wearing spectacles. Can we conclude at 5% level of significance that population proportion of students wearing spectacles is more than 10%?

30) Solve the following game by using dominance principle. Is the game fair?

		Player – B			
		B_1	B_2	B_3	B_4
Player – A	A_1	2	1	-3	0
	A_2	6	4	5	0
	A_3	-1	3	0	-2

31) The cost of a machine is Rs 30,000 and its maintenance cost and resale value at different years are given below:

Year	1	2	3	4	5
Maintenance cost (in Rs)	1000	2000	3100	4500	6000
Resale value (in Rs)	20000	16000	13000	10000	8000

Determine the optimal period for the replacement of the machine.

VII. Answer any TWO of the following questions: (2 X 5 = 10)

32) Daily wages of 100 workers are normally distributed with mean Rs 600 and standard deviation Rs 50. Find the number of workers getting wages between Rs 500 and Rs 650.

33) Test whether means differ significantly from the following data at 1% level of significance.

	Sample – I	Sample – II
Size	10	12
Mean	62	55
Variance	16	25

34) If n = 100 and $P' = 0.02$, then find the control limits for np-chart.

35) Solve the following linear programming problem graphically:

Maximize $Z = 20x + 14y$

Subject to constraints: $3x + 2y \leq 18$

$4x + 3y \geq 12$

and $x, y \geq 0$

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SECTION – D

VIII. Answer any TWO of the following questions: **(2 X 10 = 20)**

36) Calculate standardized death rates for the following data and state which village is more healthier.

Age group (in years)	Village – A		Village – B		Standard population
	Population	Deaths	Population	Deaths	
0 – 16	6000	60	4000	48	5000
16 – 40	16000	96	12000	48	15000
40 – 60	8000	80	7000	63	6000
60 and above	5000	200	3000	117	4000

37) Compute Laspeyre's, Paasche's and Dorbish-Bowley's price index numbers for the following data.

Items	2020		2025	
	Price (in Rs)	Quantity	Price (in Rs)	Quantity
A	10	06	20	15
B	15	10	10	20
C	38	09	50	16
D	30	08	40	28

38) a) Find the trend values for the following time series data by using three yearly moving averages. **(05)**

Year	2019	2020	2021	2022	2023	2024	2025
Value	69	61	68	54	49	56	48

b) Fit a straight line trend equation of the form y = a + bx to the time series data given below. **(05)**

Year	2018	2019	2020	2021	2022	2023	2024
Production (in '000 tons)	79	83	90	94	90	95	99

SECTION - E
(For Visually challenged students only)

35) Write the procedure of solving linear programming problem graphically.

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