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FOR KARNATAKA CLASS 12 PREPARATION

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

EXAM	YEAR	TYPE	SUBJECT
Karnataka Class 12	2027	Sample Paper	Statistics

GOVERNEMENT OF KARNATAKA

KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD

6th CROSS, MALLESHWARAM, BENGALURU-560 003

2026-27 II PUC MODEL QUESTION PAPER- 2

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 condition for the time reversal test is

a) $P_{01} \times Q_{01} = V_{01}$ b) $P_{01} \times P_{10} = 1$ c) $P_{01} \times P_{10} = 0$ d) $P_{01} \times V_{01} = Q_{01}$

2) In a binomial distribution, if np = 2, the relation between mean and mode is

a) Mean > Mode b) Mean < Mode c) Mean ≠ Mode d) Mean = Mode

3) The probability of rejecting the null hypothesis, when it is actually true is called

a) Size of a test b) Power of a test c) Type – I error d) Type – II error

4) In statistical quality control, if standard is known, then the central line of R-chart is

a) σ' b) $d_2\sigma'$ c) $D_1\sigma'$ d) $D_2\sigma'$

5) The minimum of the column maximums is known as

a) Strategy b) Saddle point c) Minimax d) Maximin

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

(Statistic, Cohort, 0, Irregular, $\chi^2(2)$, Parameter)

6) The life table gives the life history of a _____ as it gradually diminished by deaths.

7) The sudden unexpected variation in the time series is called _____ variation.

8) If Z_1 and Z_2 are two standard normal variates, then the distribution of $Z_1^1 + Z_2^2$ is _____.

9) A function of the sample values is called a _____.

10) A game is said to be fair, if the value of the game is _____.

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

11)

A	B
a. The capacity of a woman to bear children	i. Economically stable
b. Base period	ii. Shortages are allowed
c. t-distribution curve	iii. Shortages are not allowed
d. Likely value of the unknown parameter	iv. Fecundity
e. Inventory model - II	v. Estimate
	vi. Asymptotic to the X-axis

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

12) Write the formula for estimating population between census years.

13) Mention one of the uses of index numbers.

14) For what value of 'p' binomial distribution is symmetrical?

15) Define null hypothesis.

16) When do you say that a basic feasible solution of transportation problem is degenerate?

SECTION – B

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

17) Obtain the trend values by the method of semi-averages for the following time series data.

Year	2018	2019	2020	2021	2022	2023	2024
Value	30	52	44	50	40	46	58

18) Write two assumptions of interpolation and extrapolation.

19) Write the Bernoulli distribution with parameter $p = \frac{3}{5}$.

20) If the parameter of t-distribution is 6, find the standard deviation.

21) Mention two branches of statistical inference.

22) Write the chi-square test statistic with degrees of freedom in testing of independence of attributes in 2x2 contingency table.

23) Mention two types of causes for variation in a manufacturing process.

24) If R = 100 units/month, C_3 = Rs 100, and C_1 = Rs 0.50/unit/month, then find Q^0.

SECTION – C

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

25) Calculate the consumer price index number by aggregative expenditure method for the following data.

Commodity	Quantity 2019	Price per unit (in Rs)	
		2019	2024
A	15	07	09
B	20	14	18
C	10	21	17
D	25	16	19
E	30	21	27

26) Interpolate and extrapolate the sales for the years 2021 and 2025 from the following data.

Year	2019	2020	2021	2022	2023	2024	2025
Sales (in Crore Rs)	20	24	-	30	36	50	-

27) Fit a Poisson distribution to the following data and obtain the theoretical frequencies for the number of printing mistakes per page.

Number of printing mistakes	0	1	2	3	4 & more
Number of pages	61	21	15	3	0

28) There are 15 lecturers in a college. Out of them, 8 belong to the science faculty. The college management builds 5 residential quarters and allots them to 5 randomly selected lecturers. By using hyper-geometric distribution, find the probability that
(i) all the quarters are allotted to science lecturers
(ii) three quarters are allotted to science lecturers.

29) A machine makes screws with diameter 0.3 inches. A random sample of 10 screws show mean diameter 0.32 inches with a standard deviation of 0.15 inches. Test whether the machine is functioning properly at 5% level of significance.

30) Find an initial basic feasible solution for the following transportation problem by North-West corner rule method and compute the total transportation cost.

		Ware house				Supply
		P	Q	R	S	
Factory	A	25	17	25	14	300
	B	15	10	18	24	500
	C	16	20	8	13	600
Demand		75	325	500	500	1400

31) The purchase price of a machine is Rs 25,000. Its maintenance cost and resale value at different years are as follows:

Year	1	2	3	4	5
Maintenance cost (Rs)	600	1300	2020	3000	4100
Resale value (Rs)	19000	17000	15000	12000	10000

What would be the optimum replacement period for the machine?

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

32) Height of group of 1000 candidates, who attended the army selection camp is normally distributed with mean 154 cm and standard deviation 3 cm. Minimum eligible height for army selection is 157 cm. How many candidates from above group are eligible?

33) In an institution, out of 200 students who took SSLC examination, 180 passed and out of 300 students who took PUC examination, 240 passed. At 1% level of significance, can it be concluded that SSLC students have performed better than the PUC students?

34) Ten samples each of size 5 were inspected and number of defectives in each of them are as follows:

Sample number	1	2	3	4	5	6	7	8	9	10
Number of defectives	0	1	2	3	3	2	1	0	1	2

Obtain the control limits for np-chart..

35) Solve the following linear programming problem graphically:
Maximize $Z = 2x + 3y$
Subject to constraints: $x + y \geq 350$
$2x + y \leq 600$
and $x, y \geq 0$

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SECTION – D

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

36) a) Compute the 'total fertility rate' from the following data. **(05)**

Age group (in years)	Female population	Live births
15 – 19	20000	500
20 – 24	18000	1800
25 – 29	15000	1800
30 – 34	13000	1430
35 – 39	11000	550
40 – 44	10000	294
45 – 49	8000	80

b) Calculate the 'standardized death rate' for the following data. **(05)**

Age group (in years)	Population	Deaths	Standard population
0 – 20	8000	80	7000
20 – 40	10000	90	9000
40 – 60	7000	105	5000
60 & above	5000	155	4000

37) Calculate Marshall – Edgeworth's and Fisher's price index numbers from the following data.

Item	2019		2024	
	Price (in Rs)	Quantity	Price (in Rs)	Quantity
A	10	12	19	15
B	14	15	22	19
C	21	25	19	37
D	27	20	36	25

38) Fit a quadratic trend equation of the form $y = a + bx + cx^2$ by the method of least squares to the following time series data. Estimate the value for 2024.

Year	2019	2020	2021	2022	2023
Value	40	20	30	15	25

SECTION - E
(For Visually challenged students only)

35) A manufacturer produces 2 products, A and b which need two machines P and Q. Product A requires 6 hours on machine P and 2 hours on machine Q. Product b requires 4 hours on machine P and 4 hours on machine Q. There are 60 hours of time available on machine P and 80 hours on machine Q. Profit earned by the manufacturer on selling one unit of product A is Rs 20 and one unit of product B is Rs 12. Formulate the linear programming problem.

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