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FOR KARNATAKA CLASS 12 PREPARATION

Karnataka 2nd PUC Model Question Paper 2027 for Statistics (Paper 3)

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- 3

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) In a life table, the size of the cohort is
a) Longevity b) Radix c) Mortality ratio d) Survival ratio

2) The regular, periodic and short term variation in a time series is called
a) Irregular variation b) Cyclical variation c) Seasonal variation d) Secular trend

3) In a hyper-geometric distribution, if a = 2, b = 4 and n = 3, the range is
a) x = 0,1 b) x = 0,1,2 c) x = 0,1,2,3 d) x = 0,1,2,3,4

4) There are four possible decisions under the testing of null hypothesis (H_0):
i) Accept H_0 when it is true ii) Accept H_0 when it is not true
iii) Reject H_0 when it is true iv) Reject H_0 when it is not true
The correct decisions are:
a) i and iv b) i and iii c) ii and iv d) ii and iii

5) Graphical solution to the linear programming problem lies in the
a) IV quadrant b) III quadrant c) II quadrant d) I quadrant

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

(Fisher's, Least, $\sqrt{\frac{PQ}{n}}$, Annual, $\sqrt{pq}$, Quinquennial)

6) Total fertility rate of a population in a year is the total of _____ age specific fertility rates of females of child bearing age.

7) The factor reversal test is satisfied only by _____ index number.

8) The standard deviation of Bernoulli distribution is _____.

9) Standard error of sample proportion 'p' is _____.

10) The equipment is replaced at the end of a year for which the annual average cost is the _____.

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

11)

A	B
a. N.R.R. per woman = 1.1	i. Inventory
b. Paasche's index number	ii. Population is increasing
c. Poisson distribution	iii. Population is decreasing
d. Maximum size of the test	iv. Downward bias
e. Physical stock of goods	v. Level of significance
	vi. Mean = variance

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

12) Mention one of the characteristics of index numbers.

13) Write the median of a t-distribution.

14) Define point estimation.

15) Which type of 'cause of variation' is detected by statistical quality control?

16) Write the formula of to-date annual average cost in a replacement problem.

SECTION – B

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

17) State two conditions of least squares method of measuring trend.

18) Define 'interpolation' and 'extrapolation'.

19) Find the mean of a hyper-geometric distribution with parameters a = 6, b = 4 and n = 5.

20) Find the variance of a chi-square distribution with 8 degrees of freedom.

21) Define: 'type – I error' and ' type – II error'.

22) If $(\bar{x}_1 - \bar{x}_2) = 2.6$ and S.E.$(\bar{x}_1 - \bar{x}_2) = 1.3$, find the value of test statistic Z.

23) If $P' = 0.1$ and n = 100, calculate the upper control limit for d-chart.

24) If $Q^0 = 300$ units, C_1 = Rs 10/unit/year and C_2 = Rs 40/unit/year, then find the maximum inventory level.

SECTION – C

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

25) Calculate Kelly's price index number for the following data and comment on the result.

Items	Price (in Rs)		No. of units sold
	2019	2024	
A	21	27	10
B	30	40	15
C	15	23	12
D	40	37	20

26) Interpolate and extrapolate the profit for the years 2019 and 2025 by using binomial expansion method from the following data.

Year	2015	2017	2019	2021	2023	2025
Profit (Cr Rs)	8	14	-	21	30	-

27) In a college, 60% of the students are girls. In a random sample of 5 students, find the probability of getting (i) 3 girls, (ii) at least one girl.

28) On an average a telephone operator receives 4 telephone calls per 10 minutes interval. Find the probability that in a particular 10 minutes interval he
(i) does not receive any calls
(ii) receives more than 2 calls.

29) The standard deviation of production of wheat is assumed to be 10.2. A sample of 25 acres showed that the standard deviation is 8.2. Test at 1% level of significance whether the standard deviation of production of wheat is less than 10.2.

30) Obtain an initial basic feasible solution for the following transportation problem by matrix-minima method. Find the total transportation cost.

		To				Supply
		D_1	D_2	D_3	D_4	
From	O_1	15	3	7	14	80
	O_2	5	6	10	12	70
	O_3	4	11	8	9	50
Demand		25	45	40	90	

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

		Player – B		
		B_1	B_2	B_3
Player – A	A_1	-2	6	7
	A_2	0	5	4
	A_3	-5	3	8
	A_4	-6	0	9

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

32) Marks scored by the students of a class follow normal distribution with mean 60 and standard deviation 6 marks. Find the probability that a student selected at random from the class scored
(i) more than 75 marks (ii) between 54 and 66 marks.

33) Following is the data regarding five students administered for an I.Q. test before and after treatment of yoga.

I.Q. before yoga	120	116	118	125	115
I.Q. after yoga	118	125	125	130	120

Is yoga treatment effective in improving I.Q.? (Use 5% level of significance).

34) Calculate the control limits for $\bar{X}$ - chart when $\bar{\bar{X}} = 30$, $\bar{R} = 20$ and $n = 4$.

35) Solve the following linear programming problem graphically:
Minimize $Z = 10x + 15y$
Subject to constraints: $4x + 3y \geq 24$
$4x + 5y \leq 40$
and $x, y \geq 0$

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SECTION – D

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

36) Compute the standardized death rates from the following data and find which locality is more healthier.

Age group (in years)	Standard population	Locality – A		Locality – B	
		Population	Deaths	Population	Deaths
0 – 10	2000	4000	36	3000	27
10 – 40	16000	12000	120	20000	240
40 – 60	5000	6000	78	4000	56
60 & above	7000	8000	168	3000	60

37) a) Calculate the value index number for the following data and comment on the result. **(05)**

Item	2018		2024	
	Price (in Rs)	Quantity	Price (in Rs)	Quantity
A	40	10	50	11
B	30	12	40	13
C	25	14	30	16
D	12	15	16	16

b) Compute the consumer price index number by using family budget method for the following data. **(05)**

Group	Price (in Rs)		Weight
	Base year	Current year	
Food	4000	5000	20
Housing	3000	3600	25
Clothing	1500	1635	10
Fuel	2000	2600	15
Other	3500	4900	20

38) Fit an exponential curve of the type $y = ab^x$ for the following time series data and estimate the value for the year 2025.

Year	2020	2021	2022	2023	2024
Value	15	27	79	177	205

SECTION - E
(For Visually challenged students only)

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

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