

GOVERNMENT DEGREE COLLEGE (A) : NAGARI
STATISTICS (MINOR)
FIRST YEAR – II SEMESTER (W.E.F. Academic Year 2024 - 25)
COURSE 1: DESCRIPTIVE STATISTICS

MODEL PAPER

Time : 3 Hours

Max. Marks :70

Electronic Scientific Calculators will be permitted

SECTION – A

Attempt any FIVE Questions Each
question carry FOUR Marks
4 X 5 = 20 Marks

- 1). Distinguish between Classification and Tabulation ?
- 2). Give the limitations of statistics ?
- 3). Explain about Diagrammatic Representation ?
- 4). Prove that $A.M \geq G.M \geq H.M$
- 5). Calculate Geometric Mean from the following data ?

Classes	5-10	10-15	15-20	20-25	25-30	30-35	35-40
Frequency	16	25	34	50	41	11	3

- 6). Describe about Sheppard Corrections for moments ?
- 7). With usual notations Prove that $\beta_2 \geq 1$?
- 8). A bag contains 3 Red 8 White and 5 Black bolls. If a person draw 4 balls at random then what is the probability that there is atleast one ball of each colour among the balls drawn.

SECTION – B

Attempt any FIVE Questions
Each question carry TEN Marks
10 x 5 = 50 Marks

9. Define Statistics and explain importance of statistics ?
10. Describe various methods for collecting Primary data and Secondary data

11. Describe Graphical Representation of Statistical Data and also explain different types of Graphical Representation ?

12. Construct Ogive curve to the following data and find Median , First and Third Quartiles from it ?

Class Interval	0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24-27	27-30
Frequency	17	4	22	30	15	10	18	34	41	17

13. Explain Mean, Median and Mode along with their merits and demerits ?

14. If the mean is 1.46 then find Missing frequencies from the following data ?

No. Of Accidents	0	1	2	3	4	5	Total
No. Of days	46	?	10	25	?	5	200

15. Define Measure of Dispersion and explain about various measures of dispersion ?

16. Derive first four Central Moments in terms of Raw Moments ?

17. State and Prove Addition theorem on probability for 'n' events

18. State and Prove Boole's Inequality for 'n' events ?

**CHOICE BASED
CREDIT SYSTEM
FIFTH SEMESTER**

Domain Subject : STATISTICS(WITH MATHS) - ENGLISH
MEDIUM ONLY

**Skill Enhancement Course(Elective) –
Course 6A:OPERATIONS RESEARCH – I
(Under CBCS New Regulations w.e.f. 2020-21)
(Scientific calculators are allowed)**

Time:3 Hours

MODEL QUESTION PAPER

Max.Marks:75

PART -A

Answer any FIVE of the following questions. Each question carries 5 Marks 5X5=25M

1. Give various definitions of OR ?
2. Discuss the limitations of OR
3. Explain the procedure to formulate LPP?
4. Define Feasible, Basic feasible and Unbounded solutions?
5. Define Canonical form of LPP and give its characteristics ?
6. Explain the following terms ?
(1) Slack Variable (2) Surplus Variable with examples
7. Explain Big M-Method ?
8. Explain about simulation?

PART-B

Answer ALL questions. Each question carries 10 Marks.

5X10=50

M

9. Explain different characteristics of Operation Research ?
10. What is a OR model? Discuss the various Characteristics and classification scheme of models?
11. A paper mill produces two grades of papers namely X and Y. Because of raw material restrictions it cannot produce more than 400 tones of grade X and 300 tones of grade Y in a week. There were 160 production hours in a week. It requires 2 and 4 hours to produce a tone of products X and Y respectively with corresponding profits of Rs.2000/-and Rs.5000/-per tone. Formulate the above as LPP to maximize the profit?
12. Solve the following LPP by using graphical method. Maximize
$$Z=2X_1+X_2$$

Subject to $X_1+2X_2 \leq 10$; $X_1+X_2 \leq 6$; $X_1-X_2 \leq 2$; $X_1-2X_2 \leq 1$
and $X_1, X_2 \geq 0$

13. Describe the Computational Procedure of the Simplex method for the solution of LPP?

14. Solve the following LPP by Simplex method

$$\begin{array}{ll}\text{Max} & Z = X_1 + X_2 + 3X_3 \\ \text{Subject to} & 3X_1 + 2X_2 + X_3 \leq 3 \\ & 2X_1 + X_2 + 2X_3 \leq 2 \\ & \text{and } X_1, X_2, X_3 \geq 0\end{array}$$

15. Describe Two-Phase Simplex method for the solution of LPP?

16. Solve the following LPP by using Big M Method

$$\begin{array}{ll}\text{Min} & Z = 4X_1 + X_2 \\ \text{Subject to} & 3X_1 + X_2 = 34 \\ & X_1 + 2X_2 \leq 3 \\ & \text{and } X_1, X_2 \geq 0\end{array}$$

17. Write the algorithm for Monte-Carlo Technique of simulation ?

18. A manufacturing company keeps stock of a special product. Previous experience indicates the daily demand as given below.

Daily Demand	5	10	15	20	25	30
Probability	0.01	0.20	0.15	0.50	0.12	0.02

Simulate the demand for the next 10 days. Also find the daily average demand for the product on the basis of simulated data ?

Germination time (hours) 29 10 26 30 41 29 27 27 19 18 19 31

13. Obtain Spearman's rank correlation formula
14. Derive the regression lines of y on x and x on y?
15. Distinguish between correlation and regression
16. Define Correlation ratio and state its properties
17. Explain partial and multiple regression
18. Show that for n attributes $(A_1 A_2 \dots A_n) \geq (A_1) + (A_2) + \dots + (A_n) - (n-1)N$. where N is the total number of observations.
19. Prove that in the usual notation $Q = \frac{2y}{1+y}$

Domain Subject : STATISTICS(WITH MATHS) - ENGLISH MEDIUM ONLY
Skill Enhancement Course(Elective) Course 7A: OPERATIONS RESEARCH -II
(Under CBCS New Regulations w.e.f. 2020-21)

(Scientific calculators are allowed)

Time:3 Hours

MODEL QUESTION PAPER

Max.Marks:75

PART -A

Answer any FIVE of the following questions. Each question carries **5 Marks** 5X5=25M

1. Explain Transportation problem?
2. Describe procedure for finding IBFS by North West corner rule ?
3. What is an assignment Problem? Explain mathematical representation of Assignment problem ?
4. Explain the assumptions of sequence theory?
5. Define the terms Network, Activity, Event ?
6. Explain rules of network construction?
7. Describe Payoff Matrix ?
8. Explain Maximin - Minimax principle?

PART-B

Answer **ALL** questions. Each question carries 10 Marks.

5X10=50M

9. Explain the algorithm for finding optimum solution by using Modi Method ?
10. Find IBFS for the following T.P by using North West Corner rule and Least cost entry method ?

Origins	Destinations				Supply/ Available
	D	E	F	G	
A	11	13	17	14	250
B	16	18	14	10	300
C	21	24	13	10	400
Demand/ requirement	200	225	275	250	

11. Explain Hungarian method of solving assignment problem?

12. Solve the following Assignment Problem ?

Jobs	Persons				
	P ₁	P ₂	P ₃	P ₄	P ₅
J ₁	3	8	2	10	3
J ₂	8	7	2	9	7
J ₃	6	4	2	7	5
J ₄	8	4	2	3	5
J ₅	9	10	6	9	10

13. Describe the method of Processing n 'jobs through three machines.?

14. Determine the optional sequence of jobs that minimize the total elapsed time based on the following information Processing time on machines is given in hours and passing is not allowed.

Job :	A	B	C	D	E	F	G
M ₁ :	3	8	7	4	9	8	7
M ₂ :	4	3	2	5	1	4	3
M ₃ :	6	7	5	11	5	6	12

15. Describe the algorithm for finding Total Float by using PERT – CPM Method

16. A small maintenance project consist of the following jobs whose precedence relationships is given below. Draw an arrow diagram representing the project
(ii) Find the total float for each activity?

Job	1-2	1-3	2-3	2-5	3-4	3-6	4-5	4-6	5-6	6-7
Duration(days)	15	15	3	5	8	12	1	14	3	14

17. Explain graphical method of 2xn or mx2 games ?

18. Solve the following payoff matrix, determine the optimal strategies and the value of game

$$\begin{array}{c}
 \text{B} \\
 \text{A} \quad \begin{bmatrix} 5 & 1 \\ 3 & 4 \end{bmatrix}
 \end{array}$$