PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BBA DEGREE EXAMINATION DECEMBER 2022
(First Semester)

Branch – LOGISTICS

STATISTICS FOR LOGISTICS

Time: Three Hours   Maximum: 50 Marks

SECTION-A (5 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (5 x 1 = 5)

1. The weighted A.M of the numbers 72, 75, 80 with corresponding weights 8, 10, 2 is

    (i) 75.67   (ii) 74.30   (iii) 73.13   (iv) 76.25

2. Rank correlation coefficient is

    (i) $r = 1 - \dfrac{\sum_{i=1}^{n} di^2}{n(n^2 - 1)}$

    (ii) $r = 1 - \sum_{i=1}^{n} di^2$

    (iii) $r = \dfrac{\sum_{i=1}^{n} di^2}{n(n^2 - 1)}$

    (iv) $r = 1 - \dfrac{\sum_{i=1}^{n} di}{n^2 - 1}$

3. Index number for base year is always considered as _____
    (i) 100   (ii) 101   (iii) 201   (iv) 1000

4. Which technique is used in finding a solution for optimizing a given objective, such as profit maximization or cost reduction under certain constraints?
    (i) Queuing Theory   (ii) Game theory
    (iii) Both A and B   (iv). Linear Programming

5. In throwing of n dice the exhaustive number of cases is
    (i) 6^n (ii) 6^{n-1} (iii) 6^{n+1} (iv) 6

SECTION - B (15 Marks)
Answer ALL Questions
ALL Questions Carry EQUAL Marks   (5 x 3 = 15)

6. (a) Calculate mean for the following data:

R.No :	1	2	3	4	5	6	7	8	9	10
Marks:	40	50	55	78	58	60	73	35	43	48

(OR)

(b) The median and the mode of the following wage distribution are known to be Rs33.5 and 34 respectively. 3 frequencies are missing. Find three missing values

Wages (Rs.):	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequencies:	4	16	?	?	?	6	4

7. (a) Elucidate Karl Pearson's Coefficient of Skewness and Bowley's Coefficient of Skewness.

(OR)

(b) Define and differentiate the types of Kurtosis with pictorial representation.

8. (a) Briefly outline Chain base method and construction of chain indices.

(OR)

(b) What are the Components of a Time series?

9. (a) What are the objectives of transportation problem?

(OR)

(b) Define various methods for finding Initial Basic Feasible Solution.

Cont...

10. (a) State and prove the multiplication law of probability.

(OR)

(b) For a binomial distribution of mean 4 and variance 2, find the probability of getting atleast two successes.

SECTION -C (30 Marks)
Answer ALL questions
ALL questions carry EQUAL Marks   (5 x 6 = 30)

11 (a) Lives of two models of refrigerators turned in for new models in a recent survey are:

Life (yrs)	Model A	Model B
0-2	5	2
2-4	16	7
4-6	13	12
6-8	7	19
8-10	5	9
10-12	4	1

What is the average life of each model of these refrigerators? Which model has more uniformity?

(OR)

(b) Draw a histogram, frequency polygon and frequency curve for the following data and locate the mode:

Marks :   0-10   10-20   20-30   30-40   40-50   50-60   60-70   70-80
Frequency :   4   10   16   22   20   18   8   2

12(a) Calculate the correlation coefficient and two regression equations of X on Y and Y on X from the data given below, taking the deviations from actual means of X and Y

Price (Rs)   10   12   13   12   16   15
Amount Demanded   40   38   43   45   37   43

Estimate the likely demand when the price is Rs.20.

(OR)

(b) A computer while calculating correlation coefficient between two variables X and Y from 25 pairs of observation obtained the following results:

$$N = 25; \quad \sum x = 125 \quad \sum x^2 = 650; \quad \sum y = 100 \quad \sum y^2 = 460; \quad \sum XY = 508$$

It was, however, discovered at the time of checking that two pairs of observations were not correctly copied. They were taken as (6,14) and (8,6) while the correct values were (8,12) and (6,8). Prove that the correct value of the correlation coefficient should be 2/3.

13 (a) Compute Laspeyre's , Paasche's, Marshall- Edgeworth, Index numbers for 2000 with 1995 as base year from the following data.

Items	1995		2000	
	Price	Quantity	Price	Quantity
A	6	50	10	56
B	2	100	2	120
C	4	60	6	60
D	10	30	12	24
E	8	40	12	36

(OR)

13 (b) Name the various methods of fitting a straight line to a time series and briefly explain any two of them.

14 (a) A firm has two products X and Y, and has a total production capacity of 9 tonnes per day. Both X and Y requires the same production capacity. The firm has a permanent contract to supply at least 2 tonnes of X and at least 3 tonnes of Y per day to another company. Each tonnes of X require 20 machine hours of production time and each tone of Y requires 50 machine hours of production time. The daily maximum possible number of machine hours is 360. All of the firm's output can be sold. the profit made is Rs per tonne of X and Rs 120 per tonnes of Y. Formulate this problem as an LP problem and solve it by using graphical method to determine the production schedule that yields the maximum profit.

(OR)

(b) A marketing manager has five salesman and five sales districts. Considering the capabilities of the salesmen and the nature of districts, the marketing manager estimates that the sales per month (in hundred rupees) fir each salesman in each district would be as follows:

		District				
		A	B	C	D	E
Salesman	1	32	38	40	28	40
	2	40	24	28	21	36
	3	41	27	33	30	37
	4	22	38	41	36	36
	5	29	33	40	35	39

Find the assignment of salesmen to districts that will result in maximum sales.

15 (a) . An urn contains 2 red, 3 blue and 4 black balls. Three balls are drawn from the urn at random. What is the chance that
   (i) Three balls are of different colour?
   (ii) Two balls are of same colour and third is different.
   (iii)The balls are of same colour?

<div align="center">(OR)</div>

15 (b) The local authorities in a city installed 2,000 electric lamps in streets. If the lamps have an average life of 1000 burning hour with S.D of 200 hours.
   (i) What number of lamps might be expected to fail in first 700 burning hours?
   (ii) After what period of burning hours would you expect that 10% of lamps would have failed and would be still burning by assuming that lives of the lamps are normally distributed.

<div align="center">Z-Z-Z   END</div>