[3672]-205

B. B. A. (Semester - II) Examination - 2009

BUSINESS STATISTICS

(2008 Pattern)

Time : 3 Hours]   **[Max. Marks : 80**

Instructions :

      (1) All questions are compulsory.

      (2) All questions carry equal marks.

      (3) Figures to the right indicate full marks.

      (4) Use of statistical tables and private calculator is allowed.

      (5) Notations have their usual meanings.

Q.1) (A)   Attempt **any four** of the following :   **[4x4=16]**

    (a)   Explain in brief uses of Statistics in Industry.

    (b)   What do you mean by measures of Central Tendency ? Give a real life situation where Mode is preferable to Arithmetic Mean.

    (c)   Calculate Karl - Pearson's Coefficient of Correlation from the following information :

        $n = 10$, $\Sigma x = 250$, $\Sigma y = 300$, $\Sigma xy = 7,900$, $\Sigma x^2 = 6,500$, $\Sigma y^2 = 10,000$

(d) Draw Frequency Polygon for the following frequency distribution :

Age in Years	Number of Persons
0 – 10	4
10 – 20	16
20 – 30	30
30 – 40	20
40 – 50	14
50 – 60	10
60 – 70	4

(e) Solve graphically the following Linear Programming Problem (L.P.P.) :

Max. $Z = 20x + 17y$

Subject to

$2x + 2y \leq 22$

$12x + 10y \leq 120$

$x, y \geq 0$

(f) Calculate Standard Deviation (S.D.) for the frequency distribution of marks of 100 candidates given below :

Marks	No. of Candidates
0 – 20	5
20 – 40	12
40 – 60	32
60 – 80	40
80 – 100	11

Q.2) Attempt **any four** of the following : [4x4=16]

(a) How does SRSWR differ from SRSWOR ?

(b) Calculate Correlation Coefficient between X and Y, given equations of lines of regression as follows :

X + 2Y = 5

2X + 3Y = 8

(c) Calculate Median for the following frequency distribution :

Speed (in kms.)	Number of Cars
60 – 65	12
65 – 70	32
70 – 75	50
75 – 80	85
80 – 85	15
85 – 90	6

(d) The management of hotel has employed 5 cooks and 10 waiters. The monthly salaries of a cook and a waiter are Rs. 3,000 and Rs. 2,500 respectively. Find mean salary of the employees.

(e) The Mean and S.D. of 100 observations are 40 and 5.1 respectively. It was later discovered that an observation 40 was misread as 50. Calculate correct Mean and S.D.

(f) Calculate Coefficient of Quartile Deviation for the following data :

120, 190, 161, 203, 168, 172, 200, 116, 206, 135, 121, 205, 114, 124, 200.

Q.3) Attempt **any four** of the following :   **[4x4=16]**

(a)   Define Correlation. Describe various types of Correlations.

(b)   Find regression equation of x on y from the following data :

n = 10, Σx = 60, Σy = 40, Σxy = 1,150,

Σx² = 4,160, Σy² = 1,720.

(c)   Describe the term Linear Programing Problem. Give any two real life situations where Linear Programming Problem can be applied.

(d)   The following data represents information about the goals scored by two teams in football matches :

Number of Goals Scored	0	1	2	3	4
No. of Matches by Team A	20	12	8	3	2
No. of Matches by Team B	18	10	7	6	4

Which team is more consistent ? Justify.

(e)   For the frequency distribution of number of absent days of students in a class is given below :

Number of Days Absent	Number of Students
Less than 5	25
5 – 9	50
10 – 14	125
15 – 19	37
20 – 24	13
25 and above	2
Total	**252**

Obtain :

(i)   Identify open end classes.

(ii)   State type of classification.

(iii) Class mark of third class.

(iv) Number of students absent for less than 10 days.

(f) Present the following data using subdivided bar diagram :

Sex \ Faculty	Male	Female	Total
Arts	32	40	72
Commerce	70	40	110
Science	50	30	80
Total	152	110	262

Q.4) Attempt **any four** of the following :   [4x4=16]

(a) Explain concept of Regression and state any two properties of Regression Coefficients.

(b) The following figures represent number of books issued at the counter of Commerce College Library on 8 different days :

96, 98, 75, 80, 102, 100, 94, 75

Calculate Mean, Median and Mode of the Data.

(c) Explain concept of Dispersion and Relative Measures of Dispersion.

(d) Determine an initial basic feasible solution to the following transportation problem by using North West Corner Method. Also find corresponding cost of transportation :

		Destination					
		D_1	D_2	D_3	D_4	D_5	Supply
Source	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
	Demand	3	3	4	5	6	21

(e) Explain meaning of Transportation Problem. Give any one real life situation where transportation problem can be applied.

(f) Obtain a feasible region graphically for the following L.P.P. :

Min. $Z = 20x + 40y$

Subject to

$$36x + 6y \quad 108$$
$$x + 12y \quad 36$$
$$2x + y \quad 10$$
$$x, y \quad 0$$

Q.5) Attempt **any two** of the following :

(a) (i) A company manufacturs two kinds of Industrial Batteries, Super and Excel. The profits are Rs. 40 and Rs. 30 per battery respectively. Super Battery requires twice as much time as required for Excel and if all batteries were of Excel make, the company would make 1000 batteries per day. The raw material for both the batteries is common and is sufficient to produce 800 batteries per day (both Super and Excel combined). The outer castings for the batteries are procured from two different local suppliers. The suppliers of Super model can deliver only 400 castings per day while the supplier of Excel model can supply 700 castings per day. Formulate above problem to determine the quantity of each battery to be produced to maximize profit. **[06]**

(ii) Explain an Attribute with an illustration. **[02]**

(b) (i) Determine an initial basic feasible solution to the following transportation problem by using Matrix Minimum Method. Also find corresponding cost of transportation :

		Distribution Centres				
		1	2	3	4	Supply
	I	2	3	11	7	6
Plants	II	1	0	6	1	1
	III	5	8	15	9	10
	Demand	7	5	3	2	17	**[06]**

(ii) Explain the term Constrains in LPP. **[02]**

(c) Determine an initial basic feasible solution to the following transportation problem by using Vogel's Approximation Method. Also find corresponding cost of transportation :

		Destination					
		D_1	D_2	D_3	D_4	D_5	Supply
	A	7	6	4	5	9	40
Source	B	8	5	6	7	8	30
	C	6	8	9	6	5	20
	D	5	7	7	8	6	10
	Demand	30	30	15	20	5	100	**[08]**

—————