

MID-WESTERN UNIVERSITY  
FACULTY OF MANAGEMENT  
FINAL EXAMINATION: 2075  
BACHELOR OF BUSINESS STUDIES (BBS)  
SEMESTER - II

Subject: Business Statistics - I  
Full Marks: 60

Course Code: MGMT 321  
Time: 3:00 Hours

*You are required to answer in your own words as far as applicable. Figures in the margins indicate full marks.*

**SECTION A: VERY SHORT ANSWER QUESTIONS (10 X1= 10 MARKS)**

Answer **ALL** questions.

- Q1. Define the term Statistics.
- Q2. The values of mode and median for a moderately skewed distribution are 64.2 and 68.6 respectively. Find the value of mean.
- Q3. Calculate the largest value of the data if the range is 40 and smallest value is 15.
- Q4. For 50 pairs of observations on two variables sales (X) and pricing (Y), the following results were obtained.  $\sum X = 75$ ,  $\sum Y = 80$ ,  $\sum X^2 = 130$ ,  $\sum Y^2 = 140$ ,  $\sum XY = 120$ . Find out if there exists any relationship between sales and pricing.
- Q5. If  $r = 0.6$ ,  $n = 4$  and probable error is 0.275. Is the correlation significant?
- Q6. You are given the following information about advertising (X) and sales (Y).  
 $\bar{X} = 10, \sigma_x = 3, \bar{Y} = 90, \sigma_y = 12, r = 0.8$

Find the likely sales when advertising expenditure is Rs. 15 lakhs.

- Q7. In a single throw of two dice, find the probability that the sum of two faces is 7 or 11.
- Q8. Evaluate the determinant.

$$\begin{vmatrix} a+b & 2b \\ -b & a-b \end{vmatrix}$$

- Q9. If  $A = \begin{pmatrix} 2 & -1 \\ 3 & 4 \\ 1 & 5 \end{pmatrix}$  and  $B = \begin{pmatrix} -1 & 3 \\ 2 & 1 \end{pmatrix}$ , find BA if possible.

- Q10. Define objective function of LPP.

**SECTION B: SHORT ANSWER QUESTIONS (3 X 8 = 24 MARKS)**

Answer any **THREE** questions.

- Q11. In a frequency distribution of 100 families given below, the number of families corresponding to expenditure groups 20 – 40 and 60 – 80 are missing from the table. However, the median is known to be 50. Find the missing frequencies. (8)

Expenditure	0-20	20-40	40-60	60-80	80-100
No. of families	14	?	27	?	15

- Q12. In order to find the correlation coefficient between two variables X and Y from 12 pairs of observations, the following calculations were made:

$$\sum X = 30, \sum Y = 5, \sum X^2 = 670, \sum Y^2 = 285, \sum XY = 334.$$

On subsequent verification it was found that the pair (X = 11, Y = 4) was copied mistakenly instead of (X = 10, Y = 14). Find the correct value of correlation coefficient. (8)

- Q13. Solve the following system of equations by using Cramer's rule: (8)

$$3x - 4y = -30 \text{ and } 4x - 3y = -5$$

- Q14. Solve the following LP problem graphically: (8)

Maximize:  $Z = 4x + 3y$

Subject to the constraints

$$2x + y \leq 10$$

$$X + y \leq 6$$

$$x, y \geq 0$$

**SECTION C: LONG ANSWER QUESTIONS (2 X 13 = 26 MARKS)**

Answer any **TWO** questions.

Q15. A factory pays workers on piece rate basis and also a bonus to each worker on the basis of individual output in each quarter. The rate of bonus payable is as follows:

Output in units	Bonus in rupees
70-74	40
75-79	45
80-84	50
85-89	60
90-94	70
95-99	80
100-104	100

The individual output of a batch of 50 workers is given below:

94	83	78	76	88	86	93	80	91	82
89	97	92	84	92	80	85	83	98	103
87	88	88	81	95	86	99	81	87	90
84	97	80	75	93	101	82	82	89	72
85	83	75	72	83	98	77	87	71	80

Find:

- i. Average bonus per worker for the quarter (3)
- ii. Total quarterly bonus paid to the whole batch (2)
- iii. Average output per worker (4)
- iv. Median output (4)

Q16. An analysis of the monthly wages paid to workers in the firms A and B belonging to the same industry gives the following results.

	Firm A	Firm B
No. of workers	500	600
Average monthly wages (Rs)	480	475
Variance of distribution of wages (Rs)	400	625

- i. Which firm pays larger wage bill? (3)
- ii. In which firm is there greater variability in individual wages? (4)
- iii. Find the combined mean and combined standard deviation of wage of the two firm taken together. (6)

Q17. From the given bivariate frequency distribution, find out if there exists any relationship between the age of wives and husbands and test for the significance of the result and interpret the result. Also determine the age of the wife whose husband's age is 75 years. (13)

Ages of wives in years	Ages of husbands in years				
	20-30	30-40	40-50	50-60	60-70
15-25	5	9	3	-	-
25-35	-	10	25	2	-
35-45	-	1	12	2	-
45-55	-	-	4	16	5
55-65	-	-	-	4	2