

Exam. Code : 105403

Subject Code : 1467

BBA Semester—III
STATISTICS FOR BUSINESS
Paper : BBA-303

Time Allowed—3 Hours] [Maximum Marks—50

Note :—Attempt any **TEN** short answer type questions.
Each question carries 1 marks and the total weightage is 10 marks.

SECTION—A

1. (a) For what values of 'a' and 'b' the following matrices are equal ?

$$A = \begin{bmatrix} a+3 & b^2 \\ 0 & -6 \end{bmatrix}, \quad B = \begin{bmatrix} 2a+1 & 2b \\ 0 & b^2-5b \end{bmatrix}.$$

- (b) Define the rank of a matrix.
- (c) Draw a pie diagram for the following data of Public Sector outlays :
- | | |
|-----------------------------------|-------|
| Agriculture and Rural Development | 12.9% |
| Irrigation etc. | 12.5% |
| Energy | 27.2% |
| Industry and minerals | 15.4% |
| Transport, Communication etc. | 15.9% |
| Social Service and Others | 16.1% |

- (d) Define stratified random sampling.
- (e) The mean height of 25 male workers in a factory is 61 cm and the mean height of 35 female workers in the same factory is 58 cm. Find the combined mean height of 60 workers in the factory.
- (f) The upper and lower quartiles of the heights of the students of the college are 62 inches and 54 inches. Calculate the quartile deviation and its coefficient.
- (g) The rank correlation coefficient between marks obtained by 10 students in Mathematics and Economics was found to be 0.5. Find the sum of squares of differences of ranks.
- (h) When $\bar{X} = 25$, $\bar{Y} = 22$, $\sigma_x = 4$, $\sigma_y = 5$, $r_{xy} = 0.8$. Determine the regression equation of Y on X. Also predict Y when X = 22.
- (i) What are index numbers ? Discuss their uses.
- (j) What do you understand by secular trend ?
- (k) A single letter is selected at random from the word 'PROBABILITY'. What is the probability that it is a vowel ?
- (l) State the important properties of Normal Distribution.

SECTION—B

Note :—Attempt any **TWO** long answer type questions.
Each question carries **10** marks and the total weightage is **20** marks.

2. Use Matrix method to solve the following system of equations :

$$x - y + z = 4$$

$$2x + y - 3z = 0$$

$$x + y + z = 2$$

3. Define random sampling and discuss various methods of selecting a random sample.
4. The median and mode of the following distribution are Rs. 335 and Rs. 340 respectively. Three frequency values are missing. Find the missing values when $N = 230$.

Wages in Rs.	0-100	100-200	200-300	300-400	400-500	500-600	600-700
Frequency	4	16	60	—	—	—	4

5. Calculate range and mean deviation from median of the following distribution :

X	10	11	12	13	14	15	16	17	18	19	20
Frequency	2	4	5	8	10	16	10	9	6	4	1

SECTION—C

Note :— Attempt any **TWO** long answer type questions. Each question carries **10** marks and the total weightage is **20** marks.

6. You are given below the following information about advertisement and sales :

	Advertisement Expenditure in Rs. Crores	Sales in Rs. Crores
Mean	20	120
Standard deviation	5	25
Correlation coefficient	$r = +0.8$	

- (i) Calculate the two regression equations.
 (ii) What should be the advertisement budget if the company wants to attain a sales target of Rs. 150 crores ?
 (iii) Find the most likely sales when advertisement expenditure is Rs. 25 crores.
7. Compute the trend values by the method of Least Squares.

Year	1992	1993	1994	1995	1996	1997	1998	1999
Output	56	55	51	47	42	38	35	32

8. Calculate Index number with the help of Fisher's method and Marshall Edgeworth's method :

Commodity	P_0	Q_0	P_1	Q_1
A	60	25	64	25
B	50	20	60	17.5
C	18	25	32	27.5

9. 'A' can hit a target 4 times in 5 shots, 'B' can hit 3 times in 4 shots, 'C' can hit 2 times in 3 shots. They fire a volley. What is the probability that at least two shots are hit ?