

Odd Semester, 2020

(Held in March, 2021)

BUSINESS ADMINISTRATION

(Honours)

(BBAC-102)

(Quantitative Analysis)*Marks : 75**Time : 3 hours**The figures in the margin indicate full marks
for the questions***PART—A**

(Marks : 50)

UNIT—1**1. (a)** Define statistics and discuss its scope. 3+3**(b)** Explain why statistics is important for
business and industrial activities. 4**OR**

- 2. (a)**
- Calculate the standard deviation of
-
- marks obtained by 55 students in
-
- an examination from the table given
-
- below :

6

| <i>Marks</i> | <i>Number of Students</i> |
|--------------|-------------------------------|
| 0-10 | 1 |
| 10-20 | 3 |
| 20-30 | 6 |
| 30-40 | 10 |
| 40-50 | 12 |
| 50-60 | 11 |
| 60-70 | 6 |
| 70-80 | 3 |
| 80-90 | 2 |
| 90-100 | 1 |

- (b)**
- What are the characteristics of a
-
- good average? Why are averages
-
- called measures of central
-
- tendency? 3+1

UNIT—2

3. (a) Calculate Karl Pearson's coefficient of correlation between sales (in '000 units) and expenses (in '000 rupees) for the following 10 firms :

6

| <i>Firm</i> | <i>Sales</i> (in '000 units) | <i>Expenses</i> (₹ in '000) |
|-------------|---------------------------------|--------------------------------|
| 1 | 50 | 11 |
| 2 | 50 | 13 |
| 3 | 55 | 14 |
| 4 | 60 | 16 |
| 5 | 65 | 16 |
| 6 | 65 | 15 |
| 7 | 65 | 15 |
| 8 | 60 | 14 |
| 9 | 60 | 13 |
| 10 | 50 | 13 |

- (b) What is meant by regression? Explain why the regression line is known as the line of best fit.

2+2

OR

4. (a) What are index numbers? Enumerate the uses of index numbers.

2+3

- (b) What are the objectives of a time series analysis? Discuss any two components of a time series.

3+2

UNIT—3

5. (a) From a group of 6 boys and 4 girls, four children are to be selected. In how many ways can they be selected, so that, at least, one boy is included in the group?

5

- (b) In a group of 60 people, 27 like cold drinks and 42 like hot drinks. If each person in the group likes at least one of the two drinks, calculate how many people like both cold and hot drinks.

5

OR

6. (a) Explain what you understand by the term 'probability'. How is the concept of probability relevant to business decision making under uncertainty?

3+3

- (b) If a die is tossed twice, find the probability of the event of getting a total of 9. Given that the die has shown points between 4 and 6 (both included).

4

UNIT—4

7. (a) For matrices A and B , where

$$A = \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & -2 \\ -1 & 1 \end{bmatrix}$$

verify that $(AB)^T = B^T A^T$. 4

- (b) Solve the following system of equations using Cramer's rule : 6

$$x + y - 3z = 9$$

$$-x + 2y = 6$$

$$x - y + z = -5$$

OR

8. (a) If $X + Y = \begin{bmatrix} 5 & 2 \\ 0 & 9 \end{bmatrix}$ and $X - Y = \begin{bmatrix} 3 & 6 \\ 0 & -1 \end{bmatrix}$,
find X and Y . 4

- (b) If $A = \begin{bmatrix} 0 & 4 & 3 \\ 1 & -3 & -3 \\ -1 & 4 & 4 \end{bmatrix}$, prove that $A^2 = I$. 6

UNIT—5

9. (a) Evaluate : 2+3

(i) $\lim_{x \rightarrow 2} 8 - 3x + 12x^2$

(ii) $\lim_{x \rightarrow 4} \frac{\sqrt{x} - 2}{x - 4}$

- (b) What are continuous and discontinuous functions? Give suitable examples. 5

OR

10. (a) If $x\sqrt{1+y} + y\sqrt{1+x} = 0$, prove that

$$\frac{dy}{dx} = \frac{-1}{(1+x)^2} \quad 5$$

- (b) Differentiate the following functions : 1+2+2

(i) $y = 4^x$

(ii) $y = 5x^{-3/2} + \frac{4}{\sqrt{x}} + \frac{\sqrt{x} - 7}{x}$

(iii) $y = \frac{x-4}{2\sqrt{x}}$

(7)

PART—B

(Marks : 25)

UNIT—1

11. Distinguish between—

- (a) primary and secondary data;
(b) random and stratified sampling. 2+3

OR

12. Calculate the most suitable average for the given data : 5

| <i>Class Interval</i> | <i>Frequency</i> |
|-----------------------|------------------|
| Below 50 | 15 |
| 50–100 | 20 |
| 100–150 | 36 |
| 150–200 | 40 |
| Above 200 | 10 |

UNIT—2

13. What are the different types of correlation? Illustrate your answer with suitable examples. 5

OR

14. Explain the concept of standard error of estimate. 5

(8)

UNIT—3

15. Define the following with suitable examples : 5
Finite set, Infinite set, Singleton set,
Null set and Power set

OR

16. All Kings, Jacks and Diamonds have been removed from a pack of 52 cards. The remaining cards have been well-shuffled and a card has been drawn from it. Find the probability that the card drawn is a red Queen. 5

UNIT—4

17. Define the following with suitable examples : 5
Row matrix, Column matrix, Square matrix,
Null matrix and Diagonal matrix

OR

18. Find the adjoint of the matrix

$$A = \begin{bmatrix} 3 & 1 & -1 \\ 2 & 2 & 0 \\ 1 & 2 & -1 \end{bmatrix} \quad 5$$

UNIT—5

19. State and explain the three fundamental limit theorems. 5

OR

20. Find $\frac{dy}{dx}$, when $x^y = y^x$. 5

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