

1/H-65 (ii) (Syllabus-2015)

2 0 1 6

(October)

BUSINESS ADMINISTRATION

(Honours)

(Quantitative Analysis)

(BBAC-102)

Marks : 75

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

PART—A

(Marks : 50)

UNIT—I

1. (a) What are various methods of collecting primary data? 4
- (b) Draw a histogram, frequency polygon and frequency curve for the following data : 2+2+2=6

Wages (in ₹)	: 20-30	30-40	40-50	50-60
No. of Workers	: 2	6	10	20
Wages (in ₹)	: 60-70	70-80	80-90	
No. of Workers	: 15	11	6	

(2)

OR

2. (a) Write an explanatory note on the methods of sampling. 5
- (b) The marks obtained by 10 students in a semester examination in Mathematics are 70, 65, 68, 72, 75, 73, 80, 76, 83 and 86. Find the arithmetic mean and standard deviation of the marks obtained by those students. $1+4=5$

UNIT—II

3. (a) What is scatter diagram? 2
- (b) Compute the coefficient of correlation between the heights of fathers and the heights of sons from the following data : 8
- | | | | | | | | | |
|----------------------------------|----|----|----|----|----|----|----|----|
| Heights of fathers (in inches) : | 65 | 66 | 67 | 67 | 68 | 69 | 70 | 72 |
| Heights of sons (in inches) : | 67 | 68 | 65 | 68 | 72 | 72 | 69 | 71 |

OR

4. (a) What is time series? Name the four components of a time series. $2+2=4$

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(Continued)

(3)

- (b) Calculate the trend for the following data by using 4-yearly moving average : 6

Year	: 2004	2005	2006	2007	2008	2009
Production	: 61	62	65	67	68	65
Year	: 2010	2011	2012	2013	2014	
Production	: 71	72	70	77	75	

UNIT—III

5. (a) State the distributive law of union and intersection of sets. 2
- (b) There are 1400 students in a college, 1250 of them can play football, 952 can play cricket and 60 students can neither play football nor cricket. How many students can play both football and cricket? 4
- (c) What is an independent event? Two coins are tossed once. What is the probability that the two coins show head? $2+2=4$

OR

6. (a) In how many ways can 3 boys and 4 girls be arranged so that no two boys will come together? 4
- (b) Prove that ${}^nC_r + {}^nC_{r-1} = {}^{n+1}C_r$. 3

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(Turn Over)

(4)

- (c) In how many ways can a committee of 6 gentlemen and 2 ladies be appointed from a party consisting of 10 gentlemen and 5 ladies?

3

UNIT—IV

7. (a) If

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 1 \end{bmatrix}, B = \begin{bmatrix} 1 & 3 & 0 \\ 1 & 0 & 0 \\ -1 & 1 & 2 \end{bmatrix} \text{ and } C = \begin{bmatrix} 1 \\ 5 \\ 6 \end{bmatrix}$$

verify that $(AB)C = A(BC)$.

5

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

5

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

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

$$x + 2y + z = 4$$

OR

8. (a) Define matrix. Find the determinant of the matrix

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

2+2=4

- (b) Write notes on orthogonal matrix, symmetric matrix and equality of matrices.

2+2+2=6

(Continued)

(5)

UNIT—V

9. (a) What is a function?

2

- (b) Find the points of discontinuity of a function

$$f(x) = \frac{2x^2 + x + 1}{x^2 - 7x + 12}$$

2

- (c) Evaluate the following :

2×3=6

(i) $\lim_{x \rightarrow 0} \frac{\sqrt{1+2x} - \sqrt{1-x}}{x}$

(ii) $\lim_{x \rightarrow 0} \frac{e^x - 1}{x}$

(iii) $\lim_{x \rightarrow 2} \frac{x^3 - 8}{x - 2}$

OR

10. (a) Find $\frac{dy}{dx}$ of the following :

2×3=6

(i) $y = x^3 \sqrt{1-x^2}$

(ii) $y = \log \sqrt{\left(\frac{x+1}{x-1}\right)}$

(iii) $y = (x + \sqrt{x^2 + a^2})^n$

(Turn Over)

(6)

- (b) If the total cost is given by

$$C = 10 + 2q + 3q^2$$

find the average cost and marginal cost functions, where C stands for cost and q stands for output. 2+2=4

PART—B

(Marks : 25)

11. (a) What is meant by coefficient of variation? What is its use? 2+1=3
- (b) Given, mean = 5.12 and standard deviation = 2.81. Find the coefficient of variation. 2

OR

12. A distribution consists of 50 boys and 70 girls with mean heights of 148 cm and 145 cm respectively. Find the mean height for the boys and the girls taken together. 5
13. (a) What is meant by index number? 2
- (b) Show that correlation coefficient is the geometric mean of regression coefficients. 3

(7)

OR

14. Obtain the two regression lines from the following data : 5

$$\bar{X} = 68, \bar{Y} = 150, \sigma_X = 2.5, \sigma_Y = 20, \gamma = 0.6$$

15. (a) One card is drawn at random from a pack of 52 cards. What is the probability that it is either a king or a queen? 2
- (b) If ${}^n P_4 : {}^n P_6 = 1 : 2$, find the value of n . 3

OR

16. (a) If ${}^n C_{20} = {}^n C_4$, find the value of n . 2
- (b) Verify that ${}^{n-1}P_r + r {}^{n-1}P_{r-1} = r! {}^n C_r$ for $n = 5$ and $r = 3$. 3
17. (a) What is an identity matrix? 2
- (b) State the properties of transpose matrices. 3

OR

18. If

$$A = \begin{bmatrix} 7 & 4 & -3 \\ 2 & 5 & 4 \\ 8 & -1 & 1 \end{bmatrix}$$

find $A^2 - 10A$. 5

19. (a) Find $\frac{dy}{dx}$ of the following : 3

$$4x^3 + x^2y + 3xy^2 - 5y^3 = 7$$

- (b) State the necessary and sufficient conditions for maxima and minima. 2

OR

20. Find for what value of x the function .

$$x^3 - 9x^2 + 15x - 3$$

- is maximum and minimum. 5
