

BUSINESS MATHEMATICS 2019

Time: 2 Hours

(Regular/Private)

Max. Marks: 50

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (10 Marks)

Q.1 Choose the correct answer for each from the given options:

- i. If $10^x = 1000$, then x is equal to:
 - -2
 - 2
 - **3**
 - 10
- ii. The ratio of 2.5 feet to 30 inches is:
 - **1 : 1**
 - 5 : 2
 - 1 : 3
 - 4 : 5
- iii. 20% of 600 is:
 - 20
 - 1200
 - **120**
 - 102
- iv. The graph of second degree equation $y = 2x^2 + 3x - 2$ opens:
 - **Upwards**
 - Downwards
 - To the right
 - To the left
- v. $5\sqrt{x}$ is equal to:
 - $X^{5/2}$
 - **$X^{1/5}$**
 - $X^{2/5}$
 - X^5
- vi. If $x : 25 :: 24 : 30$, then the value of x is:
 - 2
 - **20**
 - 120
 - 0.2
- vii. The x-intercept and y-intercept of the equation $X/2 + Y/3 = 1$ are:
 - **2 and 3**
 - 3 and 2
 - $\frac{1}{2}$ and $\frac{1}{3}$
 - 2 and $\frac{1}{3}$
- viii. The binary equivalent of decimal number 7 is:
 - 1110
 - **111**
 - 1001

- 101010
- ix. 1 $\begin{bmatrix} 2 & X \\ 4 & 4 \end{bmatrix} = 0$, then the value of x is:
- 8
 - 2
 - 0
 - 10
- x. When a series of payments of equal amount is made at equal intervals, each payment is known as:
- Perpetuity
 - Investment
 - Annuity
 - Interest

SECTION 'B'
SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- i. Compute compound interest on Rs. 37,000 for 4 years at the rate of 6% per annum.
- ii. Perform the following operations to the binary numbers.
 - a) $110010 - 11000$
 - b) $11001 \times 1001 + 111$
- iii. If $A = \begin{bmatrix} 3 & 5 \\ 2 & 4 \end{bmatrix}$ then find A^{-1} and show that $A \times A^{-1} = 1$.
- iv. 9 men consume 120 kg of rice in 20 days. In how many days will 15 men consume 250 kg of rice?
- v. Solve the following equations by Cramer's rule:

$$2x + 2y = 18$$

$$3x - 3y = 21$$
- vi. Find the equation of the straight line which passes through the points (10, 7) and (12, 9), also find the x-intercept and y-intercept of the straight line.
- vii. If $y = 1 + x^2 - 4x$, find the direction and Vertex of Parabola.
- viii. Convert the decimal number 50 into its equivalent binary number and the binary number 110010 into its equivalent decimal number.

SECTION "C"
DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO questions from this Section. All questions carry equal marks. The use of calculator is allowed.

- Q.3 If $A = \begin{bmatrix} 3 & 4 \\ -1 & -5 \end{bmatrix}$ and $B = \begin{bmatrix} -2 & 5 \\ 2 & -3 \end{bmatrix}$, then find:
- a) $A + B$
 - b) $A \times B$
 - c) $A^t - B^t$

Q.4 Solve the following equation:

$$\frac{3x+2}{2} + \frac{4x+5}{4} - \frac{2x-8}{8} = 16$$

Q.5 Find the sum of annuity and the present value of annuity if an amount of Rs. 20,000 is invested at the end of each quarter for 4 years at 5% per annum compounded quarterly.

BUSINESS MATHEMATICS 2018

Time: 2 Hours

(Regular/Private)

Max. Marks: 50

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (10 Marks)

Q.1 Choose the correct answer for each from the given options:

- i. $A \times A^{-1}$ is equal to:
 - Null matrix
 - A
 - 1
 - At
- ii. The ratio of 30 inches to 5 feet is:
 - 2 : 1
 - 2 : 3
 - 1 : 2
 - 3 : 60
- iii. The value of x in $4 : 3 :: x : 12$ is:
 - 16
 - a16
 - -6
 - 36
- iv. The parabola $y = -3x^2 - 6x + 7$ opens:
 - Downwards
 - Upwards
 - Towards left
 - Towards right
- v. If $[A] \neq 0$, the matrix A is called:
 - Non-singular
 - Singular
 - Square
 - Zero
- vi. The slope of the straight line $y = -4x + 8$ is:
 - 8
 - 4
 - 2
 - -4

- vii. $(25)^{1/2} \times (8)^{1/2}$ is equal to:
- 10
 - 3
 - 200
 - 8
- viii. The simple interest on Rs. 4000 for six years 3.75% per annum is Rs.:
- 900
 - 956
 - 960
 - 1960
- ix. If $10^x = 100$, then x is equal to:
- 10
 - -10
 - 2
 - 100
- x. The decimal equivalent of the binary number 100 is:
- 4
 - 5
 - 100
 - 10

SECTION 'B'
SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- i. In what time will Rs. 200/- amount to Rs. 270/- at the rate of 5% annum?
- ii. $\begin{bmatrix} 2 & 5 \\ 3 & 4 \end{bmatrix}$, $Y = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ and $Z = \begin{bmatrix} 3 & -10 \\ - & -1 \end{bmatrix}$, find the value of a and b where $aX + bY = Z$.
- iii. Solve for x:
$$\frac{2x+3}{2} + \frac{x}{4} = \frac{x}{6} - \frac{2x}{3}$$
- iv. Distribute a profit of Rs. 50,000/- among three partners Jawwad, Areeba and Humza, such that Jawwad and Areeba get the profit in the ratio 5 : 3 whereas Areeba and Humza get in the ratio 3 : 2.
- v. Solve the following equations using Cramer's Rule:
 $X + 2y = 6$
 $2x + 7y = 3$
- vi. An item is sold for Rs.1200/-. A profit of 30% is obtained. Find the cost price of item and amount of the profit.
- vii. Find the equation of the straight line which passes through two points (5, 4) and (3, 6).
- viii. Perform the following binary operations:
 - a) $11110 + 111000 + 111100$
 - b) $1111 \times 110 - 111$

SECTION "C"

DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO questions from this Section. All questions carry equal marks. The use of calculator is allowed.

Q.3 (a) 30 men build 15 rooms of equal size in 18 days. How long will 20 men take to complete 10 rooms of the same size?

b) Find the roots of equation $14 - 9x + x^2 = 0$.

Q.4 For the quadratic equation:

$$Y = 2x(4x - 1) - 15$$

Determine:

- Which way does the parabola open?
- The vertex of the parabola.
- The roots of the equation.

Q.5 Find the sum and the present value of the annuity of Rs.6000/- invested at the end of each year for 10 years at the rate of 8% compounded annually.

BUSINESS MATHEMATICS 2017

Time: 2 Hours

(Regular/Private)
SECTION 'A'

Max. Marks: 50

MULTIPLE CHOICE QUESTIONS (10 Marks)

NOTE:

- This section consists of 10 part question and all are to be answered. Each question carries one mark.
- Do not copy down the part questions in your answer book. Write only the answer in full against the proper number of the question and its part.
- The code number of your question paper to be written in bold letters in the beginning of the answerscript.
- The use of calculator is allowed.

Q.1 Choose the correct answer for each from the given options:

- The simple interest on Rupees 3000 for two years at 5% per annum is:
 - Rs.100
 - Rs.200
 - Rs.300**
 - Rs.400
- If $a : b = 3 : 5$ and $b : c = 5 : 7$, then $a : b : c$ is:
 - 3 : 7 : 5
 - 7 : 5 : 3
 - 3 : 5 : 7**
 - 1 : 1 : 1
- When a series of payments of equal amount are made at equal intervals, each payment is known as:
 - Simple Interest
 - Annuity**
 - Compound Interest
 - Investment

- iv. The ratio of 2 hours to 45 minutes is:
- 2 : 45
 - 60 : 45
 - 8 : 3
 - 4 : 3
- v. 100^0 is equal to:
- 0
 - 1
 - 10
 - 100
- vi. The graph of second degree equation is called:
- Slope
 - x-intercept
 - Parabola
 - Point
- vii. The distance between two points (2, 3) and (-2, 3) is:
- 2
 - 3
 - -2
 - 4
- viii. The slope of the line $3x + 2y = 7$ is:
- $\frac{3}{2}$
 - $-\frac{3}{2}$
 - $\frac{2}{3}$
 - -3
- ix. 12 is 30% of:
- 15
 - 20
 - 40
 - 50
- x. Multiplicative inverse of $\frac{5}{4}$ is:
- $\frac{5}{4}$
 - $-\frac{5}{4}$
 - $\frac{4}{5}$
 - $-\frac{4}{5}$

SECTION 'B'
SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- i. An item was sold at a profit of Rs. 1300/-. The rate of profit was 12%. Find the cost of the item.
- ii. Compute the compound interest on Rs. 5000/- for 4 years at the rate of 5% per annum, compounded semi-annually.
- iii. Find the equation of straight line passing through the points (4, 3) and (2, -3). Also find the x-intercept and y-intercept.
- iv. 40 machines produce 1000 screws in 100 hours. How many screws can 24 machines produce in 60 hours?
- v. Perform the following binary number operations:
 - a) 1111×110
 - b) $11110 + 101$
- vi. Solve the following equations:

$$X = \frac{\sqrt{9x-5}}{2}$$

vii. Find the value of if matrix A is singular:

$$A = \begin{bmatrix} 4 & 1 & 5 \\ 7 & 3 & 6 \\ 2 & 3 & 1 \end{bmatrix}$$

viii. Find the inverse of the following square matrix A and verify

$$A^{-1} A = I$$

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

SECTION "C"

DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO questions from this Section. All questions carry equal marks. The use of calculator is allowed.

Q. 3

- a) Distribute Rs. 93,000/- among three friends A, B and C, such that A and B get share in the ratio 1 : 3 whereas the ratio of B and C is 4 : 5.
- b) The cost of a television set is raised from Rs. 1600/- to Rs. 1680/-. Find the percent increase.

Q.4 (a) If $A = \begin{pmatrix} 1 & -1 & 2 \\ 2 & 1 & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 2 \\ 2 & 0 \\ -1 & 1 \end{pmatrix}$, find $B^t \times A^t$.

b) Solve the following using Cramer's Rule:

$$2x - 7y = 24$$

$$5x + 3y = 19$$

Q.5 Ashfaq deposits Rs. 7000/- in a bank at the end of each half year for 3 years. If the interest rate is 8%, compounded semi-annually, compute the sum of annuity and present value.

BUSINESS MATHEMATICS 2016

Time: 2 Hours (Regular/Private)

Max. Marks: 50

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (10 Marks)

Q.1 Choose the correct answer for each from the given options:

- i. A straight line is parallel to x-axis, then its slope is equal to:
 - Infinity
 - Zero
 - 1
 - 2
- ii. Simple interest on Rs. 300/- for 4 years at 5% per annum is:
 - 60
 - 66
 - 320
 - 360
- iii. 10 is 100 times greater than:
 - 0.001
 - 0.01
 - 0.1
 - 1
- iv. A matrix for which inverse does not exist is known as:
 - Unit matrix
 - Square matrix
 - Null matrix
 - Singular matrix
- v. If $x : 4 :: 10 : 2$ then x is equal to:
 - 20
 - 21
 - 22
 - 23
- vi. The distance between two points (-2, 3) and (2, -1) is:
 - 0
 - 5
 - 10
 - 20
- vii. Binary equivalent of 8 is:
 - 1000
 - 1001
 - 1010
 - 1100

- viii. If the principal amount remains unchanged throughout the interest period, such interest is called:
- Compound interest
 - **Simple interest**
 - Effective rate of interest
 - Annuity
- ix. In a quadratic equation, the highest of the variable is:
- 0
 - 1
 - **2**
 - 3
- x. The product of a matrix by its inverse is equal to:
- Null matrix
 - Singular matrix
 - **Identity matrix**
 - Row matrix

SECTION 'B'
SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- Find the x and y - intercepts of the straight line passing through (2, 0) and (0, 1). Also the slope of the line.
- Mr. Hammad invested Rs- 3, 00,000/- in a bank which earns interest at rate of 9% per annum semi-annually. What will be the balance of Mr. Hammad account after 10 years?
- Find 'x' for the equation $\frac{2}{x^3} - \frac{1}{-33} = 40$
- Perform the binary operation and write your answer in decimal form $(11001)_2 \times (1001)_2 + (1000)_2 - (1100)_2$.
- Solve for x and y using Cramer's rule:
 $2x - 3y = 5$; $4x - 5y = 11$
- 30 laborers construct 15 rooms in 18 days. In how many days can 12 laborers construct 12 rooms of the same size?
- If $x : y = 3 : 7$ then find $\frac{5x-y}{3x+2y}$
- If $A = \begin{bmatrix} 4 & 5 \\ 2 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 6 & 1 \\ 3 & 0.2 \end{bmatrix}$ and $C = \begin{bmatrix} 22 & 21 \\ 11 & 4.2 \end{bmatrix}$ then find the values of x and y when $xA + yB = C$.

SECTION "C"
DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO questions from this Section. All questions carry equal marks. The use of calculator is allowed.

Q. 3 If $A = \begin{bmatrix} 1 & 2 & 2 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ then find:
 $(A \times B) + (B^t \times A) - 2A$.

Q.4 Find the direction, vertex and roots of the parabola

$$Y = x^3 - 4x + 3.$$

Q.5 Hamza deposits Rs. 5,000 in a bank at the end of each quarter for 4 years. If the interest rate is 8% compounded quarterly, compute the present value of Annuity.

BUSINESS MATHEMATICS 2015

Time: 2 Hours (Regular/Private)

Max. Marks: 50

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (10 Marks)

Q.1 Choose the correct answer for each from the given options:

- i. Straight line passing through the origin has y-intercept equal to:
 - Infinity
 - -1
 - 1
 - Zero
- ii. If $\begin{bmatrix} a & 2 \\ 6 & 4 \end{bmatrix}$ is a singular matrix, the value of 'a' will be:
 - $\frac{3}{4}$
 - $\frac{3}{2}$
 - 2
 - 3
- iii. $\begin{bmatrix} 2 & 3 \\ 5 & 7 \end{bmatrix} \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ is equal to:
 - $\begin{bmatrix} 2 & 3 \\ 5 & 7 \end{bmatrix}$
 - $\begin{bmatrix} -2 & -3 \\ -5 & -7 \end{bmatrix}$
 - $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
 - $\begin{bmatrix} 7 & -3 \\ -5 & 2 \end{bmatrix}$
- iv. The decimal equivalent to Binary number 1001 is:
 - 7
 - 9
 - 14
 - 19
- v. If 3 x 4 matrix is multiplied by 4 x 2 matrix, the product matrix will be:
 - 4 x 4

- 3 x 2
 - 4 x 3
 - 2 x 3
- vi. $\sqrt[3]{x^2}$ is equal to:
- $\frac{1}{x^2}$
 - $\frac{2}{x^3}$
 - X^2
 - X^3
- vii. When a series of payments of equal amount are made at equal intervals, each payment is known as:
- Annuity
 - Investment
 - Simple interest
 - Compound Interest
- viii. 12 is 30% of:
- 15
 - 20
 - 40
 - 50
- ix. If $x : 15 :: 24 : 30$, then the value of 'x' is:
- 2
 - 10
 - 12
 - 16
- x. Point (4, -2) is located in this quadrant:
- 1st
 - 2nd
 - 3rd
 - 4th

SECTION 'B'
SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

- Q.2
- i. Find the equation of the straight line in general form passing through point (2, -6) and having slope $-\frac{5}{7}$. Also find X-intercept and y-intercept of the straight line.
 - ii. Jawwad bought 480 calculators at Rs. 360 each and sold them at Rs. 340 each, find the percentage of profit or loss.
 - iii. 195 men working 10 hours a day can finish a job in 20 days How many men should be employed to finish to job the I .¹ days if they work 13 hours a day?

iv. Perform the Binary operations:

(a) $(100110)_2 \times (101)_2$

(b) $(100011)_2 + (11101)_2 - (1111)_2$

v. How much money will be received by an Investor on Rs 50,000 after 10 years at rate of 12.5% compounded bi-annually?

vi. Find the value of the determinant of following matrix:

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

vii. If $A = \begin{bmatrix} 3 & 2 \\ -2 & 2 \end{bmatrix}$, find and verify A^{-1} and verify $A \times A^{-1} = I$.

viii. Solve the following equations, using Cramer's rule:

$$3x + 2y = 54$$

$$2x - 3y = 10$$

SECTION "C" DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO questions from this Section. All questions carry equal marks. The use of calculator is allowed.

Q.3 For the quadratic equation $y = -5x^2 + 2x + 3$.

Determine:

- Which way does the parabola open?
- the vertex
- the roots of the equation

Q.4 If $A = \begin{bmatrix} 3 & -1 \\ 2 & -5 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 0 & 1 \\ 9 & 1 & 5 \end{bmatrix}$ and $C = \begin{bmatrix} 4 & 3 \\ 6 & 5 \end{bmatrix}$

Find

- AB
- $2A + C$
- $A^t - C$

Q.5 Find the sum and the present value of annuity, if an amount of Rs. 500 is invested at the end of each half year for 5 years at 6% per annum compounded half yearly.

BUSINESS MATHS

2014

Time: 2 Hour

(Regular)

Max marks 50

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (20 Marks)

Q.1 Choose the correct answer for each from the given options:

- i. $6\frac{1}{2}\%$ of 1200 is:
 - 200
 - 144
 - 78
 - 116
- ii. The ratio of 1 kg to 50 grams is:
 - 20 : 1
 - 1 : 20
 - 1 : 50
 - 50 : 1
- iii. Multiplicative inverse of $\frac{3}{2}$ is:
 - $\frac{3}{2}$

- $\frac{-3}{2}$
- $\frac{2}{3}$
- $\frac{-2}{3}$

iv. In $3 : 3 :: 6 : x$ the value of x is:

- 4
- 24
- **8**
- 12

v. The binary equivalent of decimal number 16 is:

- 101010
- 100010
- **10000**
- None of these

vi. Slope of the straight line $5x + 2y = 3$ is:

- 5
- $\frac{5}{2}$
- $\frac{5}{3}$
- $\frac{-5}{2}$

vii. Simple interest on Rs. 500 for 6 months at 14.5% per year is:

- **Rs. 36.25**
- Rs. 145
- Rs. 50
- None of these

viii. $\sqrt[3]{x}$ is equal to:

- $\frac{5}{x^2}$
- $\frac{1}{x^5}$
- $\frac{2}{x^5}$
- X^5

ix. The distance between two points $(-3, -1)$ and $(2, 3)$ is:

- 40
- **$\sqrt{41}$**
- 6
- 0

x. The value of determinant $\begin{bmatrix} 1 & 4 \\ -5 & -2 \end{bmatrix}$ is:

- 13
- 15
- 7
- **18**

SECTION 'B'

SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- i. Distribute an amount of Rs. 6800 among three persons in the ratio of 1 : 5 : 4. What is the share of each person?
- ii. Selling price of an item is Rs. 250/- Find the cost price of the item if it is sold at a profit of 13%.
- iii. Find the equation of the straight line in general form passing through the points (14, 10) and (11, 6).
- iv. Perform the following binary operations:
 - a) $1110 + 1100 + 10110$
 - b) $10011 - 1010$
 - c) 10111×101
 - d) $1110 / 101$
- v. Find the inverse of the matrix $A = \begin{bmatrix} 4 & 5 \\ 2 & 6 \end{bmatrix}$
- vi. 20 men paint a building in 5 days. How long would 8 men take?
- vii. If $a : b = 13 : 14$ and $b : c = 5 : 6$, find $a : b : c$.
- viii. Find the vertex and roots of the parabola $y = 8 - 2x - x^2$

SECTION 'C'

DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.3 If $A = \begin{bmatrix} 0 & 1 \\ 2 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 4 \\ 5 & 6 \end{bmatrix}$ and $C = \begin{bmatrix} 6 & 7 \\ 5 & 8 \end{bmatrix}$

Prove that $A \times (B + C) = A \times B + A \times C$

Q.4 If an amount of Rs. 6000/- is invested at the end of the each quarter for 5 years at 6% per annum compounded quarterly, find the sum of annuity and its present value.

Q.5 Solve the following equations using Cramer's Rule:

$$2x - 3y = 5$$

$$4x - 5y = 11$$

BUSINESS MATHS

2014

Time: 2 Hour

(Private)

Max marks 50

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (20 Marks)

Q.1 Choose the correct answer for each from the given options:

- i. The decimal equivalent of the binary number 101 is:
 - 5
 - 9
 - 7
 - 15
- ii. If 4 x 2 matrix is multiplied by 2 x 3 matrix, the product matrix will be of order:
 - 4 x 3
 - 2 x 3
 - 3 x 3
 - 2 x 2
- iii. The binary equivalent of decimal number 9 is:
 - 1101
 - 1001
 - 1111
 - 1011
- iv. In a certain college, there are 360 boys and 240 girls, The ratio of boys to girls is:
 - 3 : 2
 - 2 : 3
 - 5 : 3
 - 3 : 5
- v. The inverse exists for:
 - Singular matrix
 - Non-singular matrix
 - Identity matrix
 - Square matrix
- vi. If interest is computed on principal amount for the entire period it is called:

- Annuity
 - Compound Interest
 - **Simple Interest**
 - None of these
- vii. In $4 : x :: x : 9$ value of x is:
- 36
 - -6
 - 6
 - **± 6**
- viii. Rs. 18/- is 60% of:
- Rs. 18/-
 - Rs. 60/-
 - **Rs. 30/-**
 - Rs. 100/-
- ix. The distance between the point $(-1, 2)$ and $(3, -1)$ is:
- 28
 - **5**
 - 20
 - 15
- x. The y-intercept of the straight line $7x + 9y = 63$ is:
- $\frac{7}{63}$
 - **7**
 - 9
 - $\frac{9}{63}$

SECTION 'B'

SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- i. If $A = \begin{bmatrix} 1 & -3 \\ -1 & 4 \end{bmatrix}$ and find A^{-1} and verify that $A \times A^{-1} = I$,
Where $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
- ii. Solve the following equation, using Cramer's rule:

$$3x + 2y = 12$$

$$X + 5y = 17$$
- iii. Distribute Rs. 36,000/- profit among three businessmen A, B and C such that $A : B = 3 : 2$ and $B : C = 4 : 5$.
- iv. An item was sold at a profit of Rs. 12,00/-. The rate of profit was $12\frac{1}{2}\%$. What was the cost of the item?
- v. Compute compound interest on Rs. 5,000/- for 4 years at the rate 5% compounded semi-annually.
- vi. If $A = \begin{bmatrix} 4 & -3 & 2 \\ 2 & 1 & -1 \\ 3 & 4 & 5 \end{bmatrix}$ then find $|A|$.

vii. Solve the equations:

$$\frac{2x-5}{x-4} = \frac{3x+5}{x+4} + 1$$

viii. Perform the following binary operations:

a) $(101001)_2 \times (111)_2$

b) $(101011)_2 + (1101)_2 - (10111)_2$

SECTION 'C'

DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.3 For the quadratic equation: $y = 8 - 2x - x^2$.

Find:

- Which way the parabola opens
- Vertex
- Roots of the equation

Q.4

a) If $A = \begin{bmatrix} 3 & 0 & 1 \\ 1 & 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 \\ 3 & 6 \end{bmatrix}$, find $(B \times A)^t$.

b) If $A = \begin{bmatrix} 3 & 1 & -2 \\ -5 & 3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 7 & 2 & 3 \\ -1 & 0 & 5 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 0 & 3 \\ 2 & -1 & 0 \end{bmatrix}$
Find $A + B - 2C$.

Q.5 Find the total amount and present amount of annuity of Rs. 8,000/- after 8 years at 10 % compounded semi-annually.

BUSINESS MATHS

2013

Time: 2 Hour

(Regular)

Max marks 50

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (20 Marks)

Q.1 Choose the correct answer for each from the given options:

i. The sum of matrix $A = \begin{bmatrix} 6 & -2 \\ 3 & 4 \end{bmatrix}$ and matrix $B = \begin{bmatrix} 2 & 1 \\ -2 & 3 \end{bmatrix}$:

- $\begin{bmatrix} 8 & 3 \\ 4 & 3 \end{bmatrix}$
- $\begin{bmatrix} 8 & -1 \\ 1 & 7 \end{bmatrix}$
- $\begin{bmatrix} 6 & -3 \\ -1 & 4 \end{bmatrix}$
- $\begin{bmatrix} 2 & 3 \\ 4 & -1 \end{bmatrix}$

ii. The ratio of 12 days to 8 week is:

- 3: 8
 - 1 : 4
 - **3 : 14**
 - None of these
- iii. $-35x^3 / 7x$ is equal to:
- $5x^4$
 - **$-5x^2$**
 - $5x^2$
 - $5x^3$
- iv. 80% of 60 is:
- 4.8
 - **48**
 - 0.48
 - 10
- v. AxA^{-1} is equal to:
- A
 - A^{-1}
 - **I**
 - None of these
- vi. The slope of the straight line $2y = 3 + 4x$ is:
- $3/2$
 - 4
 - 3
 - **2**
- vii. If $\begin{vmatrix} 4 & x \\ 2 & 3 \end{vmatrix} = 0$ the value of x is:
- **6**
 - -6
 - 12
 - 0
- viii. 10° is equal to:
- 0
 - 10
 - **1**
 - 100
- ix. In $3 : 4 :: 6 : x$, the value of x is:
- 4
 - 24
 - **8**
 - 12
- x. The binary equivalent of the decimal number 27 is:
- **11011**
 - 10111
 - 10101
 - 01101

SECTION 'B'

SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- i. If 15 men drink 60 gallon of water in 20 days, how many gallon will 25 men drink in 5 days?
- ii. Perform the following binary operations:
 - a) $11110 + 11000 + 11100$
 - b) 1111×110
 - c) $11110 / 101$
- iii. Find the inverse of the following matrix. $A = \begin{bmatrix} 3 & -5 \\ 2 & 4 \end{bmatrix}$
- iv. Solve the following equation for x:
$$\frac{x-1}{2} - \frac{x-2}{3} = \frac{x-3}{4}$$
- v. Selling price of a table is Rs. 560. If profit is 15% what is the cost price of the table?
- vi. Find slope and y – intercept of the straight line passing throughout the points (-3, 5) and (6, -1).
- vii. In $12 : 65 :: 8 : x$, the value of x is:
 - 3
 - 6
 - **4**
 - None
- viii. A number whose exponent is zero is always:
 - Zero
 - **One**
 - Two
 - None
- ix. The ratio of 60gm to 2kg is:
 - 5:20
 - **1:40**
 - 50.2
 - None
- x. The simple interest on Rs. 5,500 for 5 years at 7% per annum is Rs:
 - **1,952**
 - 1,945
 - 2,000
 - 1,900

Q.2

- a) Distribute Rs. 1, 00,000 between Noman and Atif such that Noman gets double of what Atif gets.
- b) 20 men can build a road of 15kg long in 18 days, how long will 25 men take to complete a 10kg long road?

Q.3

- a) A fruit seller bought 50kg mangoes at Rs. 25 per kg and sold all the mangoes for Rs. 1,450; find his loss or gain percent.

- b) Compute compound interest on Rs. 5,000 for $7\frac{1}{2}$ years at the rate of $4\frac{1}{2}\%$ compounded semi-annually.

Q.4

- a) Find the equation of the straight line in general form which passes through the points (-2, 5) and (3, -4). Also find the distance between the above points.
b) Find the slope and y-intercept of the straight line obtained in Q.4 (a) above.

Q.5

- a) Solve the equation $\frac{3x-2}{2} + \frac{2x-1}{3} = \frac{6x-1}{3}$
b) For the equation $y = x^2 - 2x - 8$, find the vertex and the roots of the equation.

Q.6

- a) Convert the decimal number 89 to the equivalent binary number and the binary number 1011001 to the equivalent decimal number.
b) Perform the following binary operations:

Q.7

- a) For the matrices given below:

$$A = \begin{bmatrix} 3 & 4 \\ 2 & -3 \end{bmatrix}, B = \begin{bmatrix} 7 & -3 \\ -1 & 4 \end{bmatrix}, \text{ find}$$

- i. $A \times B$
ii. $2A + 3B^t$ (3+2)
iii. Inverse of matrix B

Q.8

- a) Show the given matrix is a singular matrix.

$$A = \begin{bmatrix} 4 & 8 & 6 \\ 2 & 5 & 3 \\ 2 & 4 & 3 \end{bmatrix}$$

- b) Solve the following equations, using the Cramer's rule.

$$2x - 3y = 5$$

$$4x - 5y = 11$$

SECTION 'C'

DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.3 Solve the following equations using Cramer's rule or inverse matrix method:

$$3x + 5y = -14$$

$$4x - 2y = 16$$

Q.4 Find the sum and present value of annuity, if an amount of Rs. 8,000 is invested at the end of each quarter for 6 years at 10% per annum compounded quarterly.

Q.5 For the matrices $A = \begin{bmatrix} 2 & 1 & 2 \\ 3 & 2 & 4 \end{bmatrix}$, $B = \begin{bmatrix} -1 & 1 \\ 4 & 3 \\ 0 & 1 \end{bmatrix}$ and $C = \begin{bmatrix} 2 & 2 & 1 \\ -1 & 2 & -1 \\ 4 & 3 & 0 \end{bmatrix}$

Find:

- i. $A^t + B$
- ii. $A \times B$
- iii. The determinant matrix C

BUSINESS MATHS

2013

Time: 2 Hour

(Private)

Max marks 50

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (20 Marks)

Q.1 Choose the correct answer for each from the given options:

- i. The simple interest on Rs. 4,500/- for 2 years at 5% per year is:
 - Rs. 45/-
 - **Rs. 450/-**
 - Rs. 4,500/-
 - Rs. 45,000/-
- ii. In $9 : x :: x : 4$, the value of x is:
 - ± 2
 - ± 3
 - ± 4
 - **± 6**
- iii. If a is a matrix of order 3×2 then the order of 'A' is:
 - 2×2
 - 3×3
 - **2×3**
 - 3×2
- iv. The number of roots in a quadratic equation are:
 - 5
 - **2**
 - 3
 - 4
- v. If $a : b = 3 : 5$ and $b : c = 5 : 7$ then $a : b : c$ is:
 - $3 : 7 : 5$
 - $7 : 5 : 3$
 - **$3 : 5 : 7$**
 - None of these
- vi. If y-intercept of a straight line is 3 and its slope is 2, equation of straight line is:
 - $Y = 2x + 6$
 - $Y = 3x - 2$
 - $Y = 3x + 2$
 - **$Y = 2x + 3$**
- vii. If determinant of matrix $\begin{bmatrix} 3 & 5 \\ 9 & k \end{bmatrix}$ is zero of the value of k is:

- 15
 - -15
 - 27
 - -27
- viii. The binary equivalent of decimal number 4 is:
- 10
 - 100
 - 1000
 - 10,000
- ix. 25% of 800 is:
- 100
 - 200
 - 350
 - 500
- x. The ratio of 5 feet to 30 inches is:
- 2 : 1
 - 1 : 2
 - 1 : 6
 - 6 : 1

SECTION 'B'

SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- i. Find the selling price and profit if the cost of an item is Rs. 240,000/- and profit is 8%?
- ii. Distribute an amount of Rs. 2,400/- among three person A, B and C in the ratio of $\frac{1}{10}$, $\frac{2}{5}$ and $\frac{1}{2}$ respectively.
- iii. Find the vertex and roots of the parabola $y = x^2 - y = 8$.
- iv. Solve the following equations using inverse matrix method or Cramer's rule $5x - 2y = 1$ and $2x - y = 0$.
- v. Find the compound interest on Rs. 8,000/- borrowed at 6% per annum for 4 years.
- vi. Convert the decimal number 114 into its equivalent binary number and the binary number 1110010 into its equivalent decimal number.
- vii. Find the sum of annuity if an amount of Rs. 20,000/- is invested at the end of each six-months for 5 years at 6% per annum compounded semi-annually:
- viii. Perform the following binary operations?
 - a) $(10101)_2 + (1111)_2$
 - b) $(1101)_2 / (11)_2$
 - c) $(101)_2 \times (1111)_2$

SECTION 'C'

DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.3 Solve the following equation:

$$X + 2 = \sqrt{5x + 34}$$

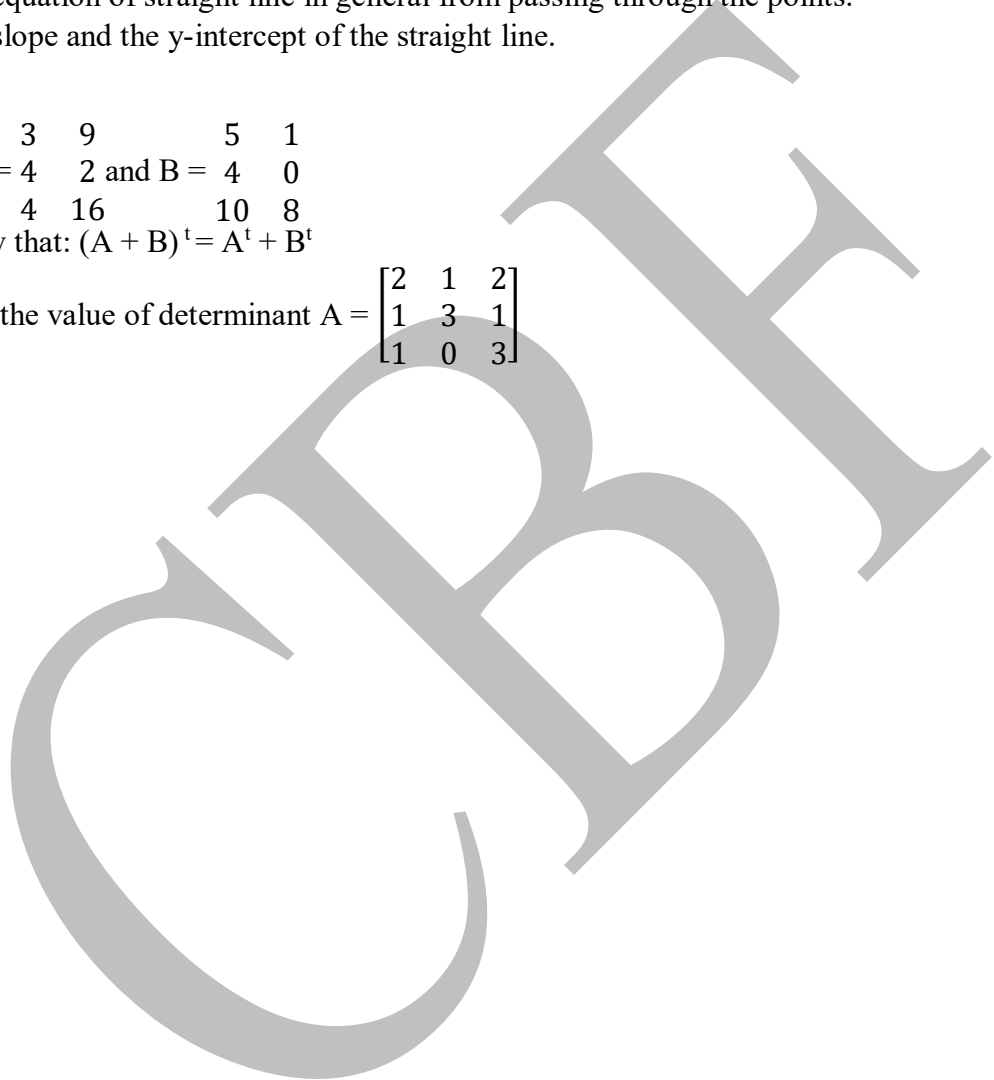
Q.4 For the points A (9, 7) and B (4, 11) determine.

- a) The distance between the points.
- b) The equation of straight line in general form passing through the points.
- c) The slope and the y-intercept of the straight line.

Q.5

a) If $A = \begin{bmatrix} 3 & 9 \\ 4 & 16 \end{bmatrix}$ and $B = \begin{bmatrix} 5 & 1 \\ 4 & 0 \end{bmatrix}$
Show that: $(A + B)^t = A^t + B^t$

b) Find the value of determinant $A = \begin{bmatrix} 2 & 1 & 2 \\ 1 & 3 & 1 \\ 1 & 0 & 3 \end{bmatrix}$



SECTION 'A'

MULTIPLE CHOICE QUESTIONS (20 Marks)

Q.1 Choose the correct answer for each from the given options:

- i. 210 is 7% of:
 - 1000
 - 2000
 - **3000**
 - 4000
- ii. If $\begin{bmatrix} x+y & 2 \\ 4 & 0 \end{bmatrix} = \begin{bmatrix} 6 & 2 \\ 4 & x \end{bmatrix}$, then the values of x & y respectively are:
 - 0 and 0
 - **0 and 6**
 - 6 and 0
 - 6 and 6
- iii. The graph of second degree equation $y = 2x^2 + 3x - 2$ opens:
 - **Upward**
 - Downward
 - To the right
 - To the left
- iv. In $x : 15 :: 24 : 30$, the value of x is:
 - **12**
 - 16
 - 10
 - 14
- v. The distance between two points (4, 3) and (2, -5) is:
 - $\sqrt{58}$
 - **$\sqrt{68}$**
 - $\sqrt{78}$
 - $\sqrt{88}$
- vi. The simplest interest on Rs. 3600 for 3 years at the rate of 6% per annum is:
 - Rs. 500
 - **Rs. 648**
 - Rs. 423
 - Rs. 216
- vii. $(100)^\circ$ is equal to:
 - 0
 - **1**
 - 10
 - 100
- viii. Multiplicative inverse of $\frac{3}{2}$ is:
 - $\frac{3}{2}$
 - **$\frac{-3}{2}$**
 - $\frac{2}{3}$

- $\frac{-2}{3}$
- ix. The ratio of 30 minutes to 1.5 hours is:
- **1 : 3**
 - 1 : 5
 - 1 : 7
 - 1 : 9
- x. When a series of payments of equal amount are made at equal intervals, each payment is known as:
- Perpetuity
 - Investment
 - **Annuity**
 - None of these

SECTION 'B'

SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- i. 9 men consume 120 kg of rice in 20 days. In how many days will 15 men consume 250 kg of rice?
- ii. Find the equation of straight line in general form passing through the point (4, -3) and (0, 3). Also find x - intercept and y - intercept.
- iii. Perform the following binary operations.
 - a) $10010 - 11000$
 - b) $110010 / 101$
 - c) 11001×1001
- iv. Find the value of the determinant, $|A| = \begin{vmatrix} 2 & 5 & 2 \\ 2 & 5 & 3 \\ 1 & 2 & 1 \end{vmatrix}$
- v. An English Dictionary was sold for Rs. 475 at a loss of 5%. Find its cost price.
- vi. An amount is invested at the ratio of 6% per annum compounded semi-annually. Find the effective rate of interest.
- vii. Solve the following system of equations using Cramer's Rule or inverse matrix method.

$$\begin{aligned} 2x - 3y &= 5 \\ 4x + 5y &= 11 \end{aligned}$$
- viii. Distribute an amount of Rs. 7800 among three persons in the ratio of 1 : 5 : 4. What is the share of each person?

SECTION 'C'

DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO part questions from this section. All questions carry equal marks. The use of calculator is allowed.

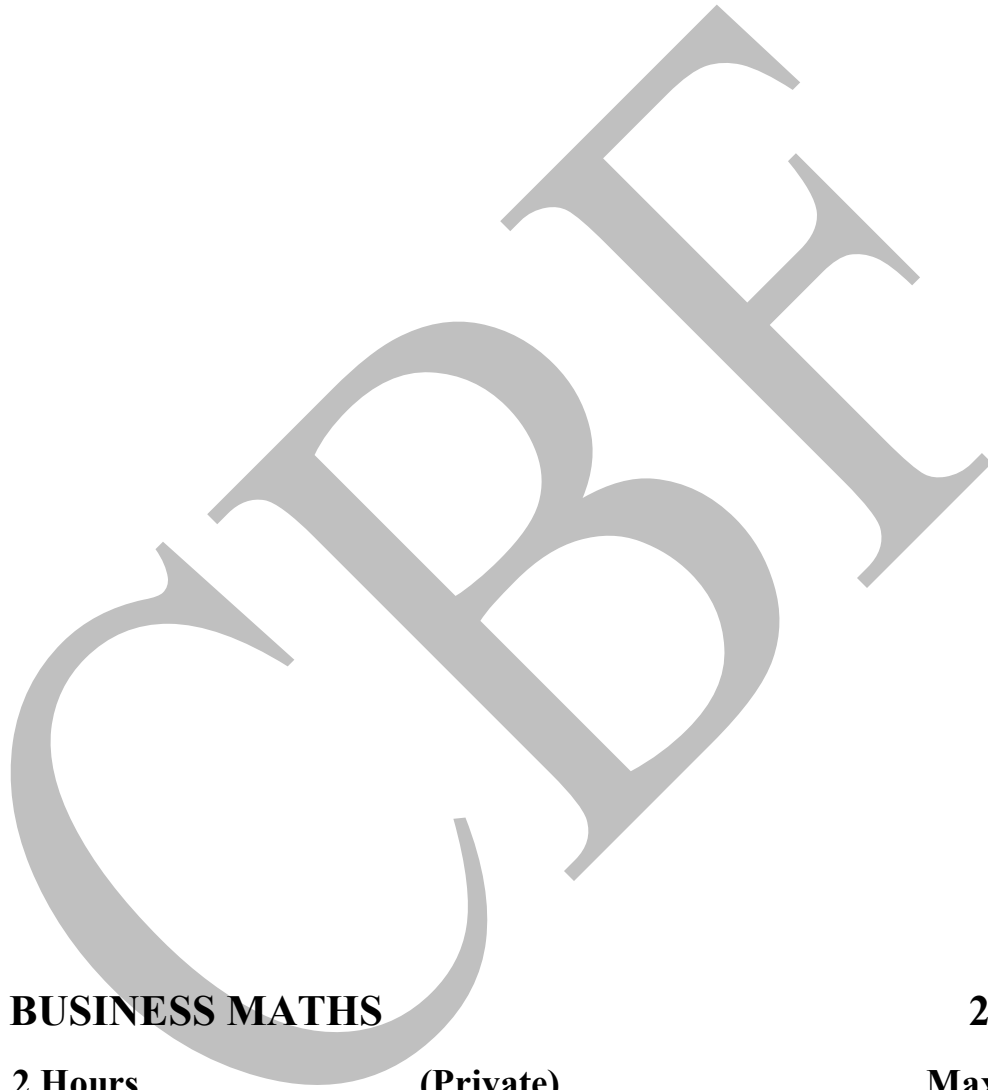
Q.3 Solve the equation:

$$\frac{3x+2}{2} + \frac{4x+5}{4} - \frac{3x+8}{8} = 16$$

Q.4 Find the sum of annuity and the present value of annuity, if an amount of Rs. 20,000 is invested at the end of each quarter for 5 years at 5% per annum compounded quarterly

Q.5 For the matrices $A = \begin{bmatrix} 2 & -3 \\ -1 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 4 & 3 \\ 2 & 1 \end{bmatrix}$, find:

- i. $A^t \times B$
- ii. $A + B$
- iii. $AA^{-1} = I$



BUSINESS MATHS

2012

Time: 2 Hours

(Private)

Max marks 50

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (20 Marks)

Q.1 Choose the correct answer for each from the given options:

- i. The ratio of 2 hours to 45 minutes is:
 - 2 : 45
 - 60 : 45
 - 8 : 3

- 4 : 3
- ii. The transpose of the matrix $\begin{bmatrix} x & 5 \\ y & -3 \end{bmatrix}$ is:
- $\begin{bmatrix} x & 5 \\ y & -3 \end{bmatrix}$
 - $\begin{bmatrix} x & y \\ 5 & -3 \end{bmatrix}$
 - $\begin{bmatrix} 5 & x \\ -3 & y \end{bmatrix}$
 - None of these
- iii. In 24: 30: x: 26, the value of x is:
- 0.208
 - 0.8
 - 20.8
 - 2.08
- iv. The distance between two points (0, 0) and (2, 2) is:
- $\sqrt{2}$
 - $\sqrt{8}$
 - $\sqrt{9}$
 - $\sqrt{4}$
- v. The value of the determinant $\begin{bmatrix} 1 & 4 \\ -5 & -2 \end{bmatrix}$ is:
- 13
 - 15
 - 7
 - 18
- vi. The binary equivalent of the decimal number 16 is:
- 101010
 - 100010
 - 100000
 - None of these
- vii. The simple interest on Rs. 4,000/- borrowed at 3% per annum for 2 years is:
- Rs. 240
 - Rs. 250
 - Rs. 370
 - Rs. 300
- viii. The decimal equivalent of the binary number 1100 is:
- 21
 - 12
 - 13
 - None of these
- ix. The roots of the equation $x^2 - 25 = 0$ are:
- ± 5
 - ± 25
 - ± 2
 - ± 1
- x. 25% of 48 is:

- 12
- 24
- 25
- 36

SECTION 'B'

SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- i. 19 men paint a building in 5 days. How long would 9 men take?
- ii. Find compound interest on Rs. 640/- in 2 years at the rate of 4% per annum.
- iii. Find the Sum of annuity of Rs. 2,000/- invested at the end of each year for 15 years at 10% compounded yearly.
- iv. By saving 12% of his income, a man saves Rs. 1200/-. Find his income.
- v. For the equation of straight line $\frac{y}{2} + \frac{x}{4} = 1$, find the slope and y-intercept of the line.
- vi. Find the vertex of the quadratic equation $y = 14 - 9x + x^2$.
- vii. Perform the following Binary operations:
 - a) $(11111)^2 + (10111)^2$
 - b) $(101001)^2 \times (111)^2$
- viii. 5 photocopies can produce 90000 copies in 6 hours a day. How many photocopiers will be required to produce 168000 copies working 8 hours a day?

SECTION 'C'

DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.3 Solve the following system of equations using Cramer's Rule:

$$3x - y = 1$$

$$x + 2y = 5$$

Q.4 Selling price of an item is Rs. 270/-. Find the cost price of the item if it is sold at a profit of 12%.

Q.5 A and B are two given matrices: $A = \begin{bmatrix} 1 & 2 \\ 0 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 2 & 3 \\ -1 & 4 & -2 \end{bmatrix}$

Find:

- i. $A \times B$
- ii. $B^t \times A$
- iii. A^{-t}

BUSINESS MATHS

2011

Time: 2 Hours

(Regular)

Max marks 50

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (20 Marks)

Q.1 Choose the correct answer for each from the given options:

- i. Slope of the line $5x - 2y = 3$ is:
 - 5
 - $\frac{5}{2}$
 - $\frac{5}{3}$
 - $-\frac{5}{2}$
- ii. What percentage of Rs. 75/- is Rs. 45/-?
 - 25
 - **60**
 - 45
 - 50
- iii. The decimal equivalent of binary number 1101 is:
 - 11
 - **13**
 - 12
 - 21
- iv. The distance of origin (0, 0) from the point (-5, 7) is:
 - **$\sqrt{74}$**
 - $\sqrt{25}$
 - $\sqrt{49}$
 - 4
- v. The binary equivalent of decimal number 17 is:
 - 10010

- **10001**
 - 100010
 - 101010
- vi. If $\begin{bmatrix} y+2 & 3 \\ 9 & 0 \end{bmatrix} = \begin{bmatrix} 4 & 3 \\ 9 & x \end{bmatrix}$, then the value of x is:
- $Y + 2$
 - 2
 - **0**
 - 81
- vii. $6\frac{1}{2}\%$ of 1200 is:
- 200
 - 144
 - **78**
 - 116
- viii. $\sqrt[5]{x}$ is equal to:
- $X^{5/2}$
 - $X^{1/5}$
 - $X^{2/5}$
 - X^5
- ix. The value of x in $x : 26 :: 24 : 30$ is:
- 2.08
 - **20.8**
 - 0.8
 - 0.208
- x. The ratio of 1 kg to 50 grams is:
- **20:1**
 - 1:20
 - 1:50
 - 50:1

SECTION 'B'

SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- i. An item is sold for Rs. 600/-. A profit of 15% is, obtained. Find the cost price of the item and amount of the profit.
- ii. Distribute an amount of Rs. 1600/- among A, B and C in the ratio of $\frac{1}{10}$, $\frac{2}{5}$ and $\frac{1}{2}$ respectively.
- iii. If $a:b = 5:7$ and $a:c = 3:14$, find $a:b:c$.
- iv. Perform the following binary operations:
 - a) $(101011)^2 + (1101)^2 - (10111)^2$.
 - b) $(1010)^2 \times (101)^2$
- v. Find, in general form, equation of the straight line passing through the points (0, 3) and (5, 2). Also find x-intercept and y-intercept.
- vi. Solve the following system of equations using Cramer's Rule:

$$2x - 3y = 17$$

$$5x + 2y = 52$$

- vii. Find the compound interest and simple interest of Rs. 5000/- borrowed at 4% per annum for 3 years.
viii. If 1400 workers make 11 miles of rail road in 12 weeks. How long will it take 2400 workers to make 27.5 miles of rail road?

SECTION 'C'

DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.3 Solve the equation:

$$\frac{2x-5}{x-4} = \frac{3x+5}{x+4} + 1$$

Q.4 If $A = \begin{bmatrix} 3 & 4 \\ -1 & 5 \end{bmatrix}$, $B = \begin{bmatrix} x & 5 \\ y & -3 \end{bmatrix}$ and $C = \begin{bmatrix} 1 & 0 & 0 \\ 2 & 3 & 4 \end{bmatrix}$

Find:

- $A + B$
- $A \times C$
- $A^t - B^t$

Q.5 Find the sum of the annuity and the present value of annuity, if an amount of Rs. 5000/- is invested at the end of each quarter for 5 years at 5.5% per annum compounded quarterly.

BUSINESS MATHS

2011

Time: 2 Hours

(Private)

Max marks 50

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (20 Marks)

Q.1 Choose the correct answer for each from the given options:

- The graph of second degree equation $y = -x^2 + x + 1$ opens:
 - Both ways
 - Upward
 - Downward**

- Neither side
- ii. The y-intercept of the line $3y = 2 - 4x$ is:
- $\frac{2}{3}$
 - $\frac{1}{4}$
 - $\frac{4}{3}$
 - 3
- iii. When a series of payments of equal amount are made at equal intervals, each payment is known as:
- Perpetuity
 - Investment
 - Installment
 - **Annuity**
- iv. In $3 : 4 :: 6 : x$, the value of x is:
- 6
 - **8**
 - 4
 - -8
- v. 8% of a number is 56, the number is:
- 143
 - 428
 - 560
 - **700**
- vi. The distance between the two points (5, 4) and (2, 3) is:
- $\sqrt{10}$
 - $\sqrt{54}$
 - $\sqrt{98}$
 - **None of these**
- vii. The ratio of 85 paisa's and 3 Rupees is:
- 3 : 85
 - **17: 60**
 - 60 : 17
 - 85 : 3
- viii. 40% of Rs. 250/- is:
- Rs. 10/-
 - Rs. 15/-
 - **Rs. 100/-**
 - Rs. 150/-
- ix. The simple interest on Rs- 4500/- for 3 years at 7% per year is:
- Rs. 105/-
 - Rs. 135/-
 - Rs. 315/-
 - **Rs. 945/-**
- x. The binary equivalent of the decimal number 37 is:
- **100101**
 - 10100

- 101101
- 110011

SECTION 'B'

SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- i. Nine men paint a building in 21 days. How long would 7 men take?
- ii. Distribute an amount of Rs. 50,000/- among A, B and C in the ratio of 10: 5: 1. What are the shares of A, B and C?
- iii. A man buys a clock for Rs. 800/- and sells it at a profit of 15%. Find the selling price.
- iv. Perform the following binary operations:
 - a) $(101001)^2 \times (111)^2$
 - b) $(11111)^2 / (1011)^2$
- v. Find the compound interest on Rs. 25,000/- in 6 years at the rate of 4% per annum.
- vi. Find value of the determinant $|A| = \begin{vmatrix} 8 & 4 & 9 \\ 2 & 7 & 6 \\ 0 & 1 & 5 \end{vmatrix}$.
- vii. Find equation of the straight line which passes through the points (11, 6) and (14, 10). Also find x-intercept of the line.

(viii) Solve the quadratic equation $14 - 9x + x^2 = 0$.

SECTION 'C'

DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.3 Solve the following system of equations using Cramer's Rule:

$$3x + 2y = 1$$

$$5x - 3y = 27$$

Q.4 Find the sum and the present value of annuity of Rs. 6,000/- invested at the end of each year for 10 years at the rate of 8% compounded annually.

Q.5 For the matrices $A = \begin{bmatrix} 2 & 3 \\ 4 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 6 & 7 \\ 8 & 9 \end{bmatrix}$, find:

- a) $A + B$
- b) $A - B$
- c) $A \times B$

SECTION 'A'

MULTIPLE CHOICE QUESTIONS (20 Marks)

Q.1 Choose the correct answer for each from the given options:

i. The simple interest on Rs. 4500 for 2 years at 7% per annum is:

- Rs. 315
- **Rs. 630**
- Rs. 945
- Rs. 1860

ii. The slope of the straight line $3y = 2 - 4x$ is:

- $\frac{2}{3}$
- $\frac{3}{4}$

- $\frac{4}{3}$
 - None Of there
- iii. If slope = 3 and y-intercept = 5, then the equation of straight line is
- $3y = 5 + x$
 - $x = 5 + 3y$
 - **$y = 3x + 5$**
 - None of these
- iv. The decimal equivalent of the binary number 110 is:
- 2
 - 4
 - **6**
 - 10
- v. If 3 x 2 matrix is multiplied by 2 x 4 matrix, the product matrix will be a matrix of order:
- **3 x 4**
 - 2 x 3
 - 3 x 3
 - None of these
- vi. The order of matrix $A = \begin{matrix} & & 2 \\ & 5 & \\ & & 3 \end{matrix}$ is:
- 1 x 1
 - 1 x 3
 - **3 x 1**
 - None of these
- vii. If 2% of a number is 60, the number is:
- 300
 - 1200
 - **3000**
 - 5000
- viii. The binary equivalent of a decimal number 9 is:
- 1011
 - **1001**
 - 1111
 - 1011
- ix. $7\frac{1}{2}$ of 600 is:
- 60
 - **45**
 - 42
 - 30
- x. In $9 : x :: x : 4$, the value of x is:
- 36
 - 6
 - -6
 - **± 6**

SECTION 'B'

SHORT ANSWER QUESTIONS (25 Marks)

NOTE: Attempt any FIVE part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.2

- The cost of 10 chairs is Rs. 3250. Find the cost of 7 chairs.
- Eight machines can produce 560 units per day working 8 hours a day. How many machines are required to produce 1680 units per day working 9 hours a day?
- (4, 3) and (7, -2) are the two points. Find distance and slope of the line segment joining these points.
- Solve the quadratic equation $4x^2 - 12x + 9 = 0$.
- Perform the binary multiplication and subtraction.
 $(11001)_2 \times (1001)_2 - (10011)_2$.
- Find compound interest on Rs. 5500 in 4 years at the rate of 5% per annum.
- Find $\begin{bmatrix} 2 & 3 & 1 \\ 1 & 0 & -1 \end{bmatrix} \times \begin{bmatrix} 2 & 0 \\ 1 & 1 \\ 0 & 1 \end{bmatrix}$
- Find the inverse of the square matrix $A = \begin{bmatrix} 3 & 6 \\ 2 & 5 \end{bmatrix}$

SECTION 'C'

DETAILED ANSWER QUESTIONS (15 Marks)

NOTE: Attempt any TWO part questions from this section. All questions carry equal marks. The use of calculator is allowed.

Q.3 selling price of an item is Rs. 270. Find the cost of the item if it is sold at a profit of 12% on sales.

Q.4 Solve the equation

$$\frac{2x+10}{x+4} + 3 = \frac{x-2}{x-3} + 4$$

Q.5 Let $A = \begin{bmatrix} 5 & 7 \\ 3 & 6 \\ 4 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 2 \\ 7 & 5 \end{bmatrix}$, $C = \begin{bmatrix} 9 & 0 \\ 1 & 4 \end{bmatrix}$

Verify that $A \times (B + C) = A \times B + A \times C$.