



Roll No. \_\_\_\_\_ (To be filled in by the candidate)

(OLD PATTERN)

Paper Code 2 8 0 3

**Business Mathematics** (Objective Type) **Session;2011-2013**

Time: 15 Minutes

Marks: 10

**NOTE:** Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. If  $A = \begin{bmatrix} 5 & 6 \\ 8 & 9 \end{bmatrix}$ , then  $|A|$  is:  
(A) 3 (B) 24 (C) -3 (D) 21
2. 5 in binary number system is:  
(A)  $(11)_2$  (B)  $(101)_2$  (C)  $(110)_2$  (D)  $(111)_2$
3. Ratio between 6 Kg and 54 Kg is:  
(A) 1 : 8 (B) 1 : 3 (C) 1 : 9 (D) 9 : 1
4. 160 is what percentage of 80?  
(A) 50% (B) 200% (C) 100% (D) 300%
5. Formula for finding rate is:  
(A)  $\frac{I \times 100}{P \times r}$  (B)  $\frac{I \times 100}{P \times t}$  (C)  $\frac{P \times 100}{I \times t}$  (D)  $\frac{t \times 100}{P \times I}$
6. Annuity is classified into catagories.  
(A) 4 (B) 3 (C) 2 (D) 5
7.  $f(x) = x + 8$ , then value of  $f(1)$  is:  
(A) 7 (B) 8 (C) -8 (D) 9
8. The degree of equation  $2x + 5 = 0$  is:  
(A) 0 (B) 1 (C) 2 (D) 3
9. Solution of  $(x - 4)(x - 5) = 0$  is  
(A) (4, 5) (B) (-4, -5) (C) (-4, 5) (D) (4, -5)
10. If  $A = \begin{bmatrix} 3 & 4 \\ 6 & 9 \end{bmatrix}$ , then  $AdjA$  is:  
(A)  $\begin{bmatrix} 9 & -4 \\ -6 & 3 \end{bmatrix}$  (B)  $\begin{bmatrix} 3 & 6 \\ 4 & 9 \end{bmatrix}$  (C)  $\begin{bmatrix} 9 & -4 \\ 6 & 3 \end{bmatrix}$  (D)  $\begin{bmatrix} 9 & 4 \\ -6 & 3 \end{bmatrix}$

Roll No. \_\_\_\_\_ (To be filled in by the candidate)

(OLD PATTREN)

Paper Code 2 8 0

Session; 2011-2013

**Business Mathematics** (Essay Type)

Time: 1:45 Hours

Marks: 40

**Section - I**

2- Write short answers of any six parts from the following.

2 x 6 = 12

- i. Define compound interest.
- ii. What is  $13\frac{1}{2}\%$  of 98?
- iii. Define ordinary annuity.
- iv. What is the commission on Rs.6000@  $22\frac{1}{2}\%$ .
- v. Rs. 2500 has to be distributed between the two boys in the ratio 2 : 3. How many Rs does each student receive?
- vi. A company has 400 male and 150 female employees. Find the ratio of male employees.
- vii. If the simple interest on Rs.15000/= for 3 years is Rs.900/=. Find the rate of interest.
- viii. If  $f(x) = \sqrt{3x-5}$ , find  $f(x^2)$  and  $f\left(\frac{5}{3}\right)$ .
- ix. Give the domain of the function  $f(x) = \frac{2x+1}{x+2}$ .

3- Write short answers of any six parts from the following.

2 x 6 = 12

- i. Write  $\frac{2}{x+1} + \frac{3}{x+2} = 2$  in the quadratic form.
- ii. Solve the linear equation  $4x - 9 = 0$ .
- iii. Find two consecutive odd integers whose sum is 16.
- iv. Find the sum of  $(101)_2$  and  $(11)_2$ .
- v. If  $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$  find  $A^2$ .
- vi. If  $A = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$ , find  $|A|$ .
- vii. Convert 22 into binary number system.
- viii. Define a scalar matrix.
- ix. Convert  $4^{1+x} + 4^{1-x} = 10$  to a quadratic form by suitable substitution.

**Section - II**

NOTE: Attempt any two questions from the following.

8x2=16

4. (a) Find the cost price if sales price is Rs. 140 and loss is 20%.  
(b) Find the amount of an annuity of Rs. 12000/= payable at the end of each year for 10 years at the rate of 5% compounded annually.
5. (a) If  $f(x) = \frac{x^2}{x^2+1}$ , then find  $f(\sqrt{2})$  and  $f\left(\frac{1}{\sqrt{2}}\right)$ .  
(b) Solve  $5(x-7) - 2x = 1 - 3[(4x+7) - 2(x-3)]$ .
6. (a) If  $A = \begin{bmatrix} 4 & 9 \\ 7 & 6 \end{bmatrix}$ , then prove that  $AA^{-1} = I_2$ .  
(b) Evaluate  $(945)_{10} + (1111)_2$  by changing into binary system.



Roll No. \_\_\_\_\_ (To be filled in by the candidate)

Paper Code 2 8 0 1

Session; 2015-2017

**Business Mathematics** (Objective Type)

Marks: 10

Time: 15 Minutes

**NOTE:** Write answers to the questions on objective answer sheet provided. Four possible answers A, B, C & D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. The simplest ratio of 18 to 30 is:

(A) 3 : 4

(B) 3 : 5

(C) 6 : 9

(D) 6 : 7

2. 160 is 20% of what number?

(A) 8000

(B) 80000

(C) 800

(D) 80

3. 30% simple interest on Rs.500 in 2 years is:

(A) Rs.150

(B) Rs.300

(C) Rs.600

(D) Rs.900

4. Type of annuity are:

(A) 5

(B) 4

(C) 3

(D) 2

5. Value of  $f(x) = x^2 + 2x + 1$  at  $x = 2$  is:

(A) 4

(B) 6

(C) 8

(D) 9

6. If  $2x - 5 = 3$  the value of  $x$  is:

(A) 9

(B) 6

(C) 4

(D) 16

7. Quadratic equation has at the most:

(A) one root

(B) two roots

(C) three roots

(D) four roots

8. Order of the matrix  $\begin{bmatrix} 2 & 3 & 4 \end{bmatrix}$  is:(A)  $3 \times 1$ (B)  $1 \times 3$ (C)  $1 \times 1$ (D)  $3 \times 3$ 9. If  $A = \begin{bmatrix} 5 & -2 \\ 3 & 1 \end{bmatrix}$ , then  $|A|$  is:

(A) 11

(B) -1

(C) 13

(D) 17

10. 7 in binary number system is:

(A)  $(11)_2$ (B)  $(101)_2$ (C)  $(110)_2$ (D)  $(111)_2$

Roll No. \_\_\_\_\_ (To be filled in by the candidate)

Paper Code 2 8 0

**Business Mathematics** (Essay Type) **Session; 2015-2017**

Time: 1:45 Hours

Marks: 40

**Section - I**

2- Write short answers of any six parts from the following.

2 x 6 = 12

- i. Define ratio.
- ii. Divide 6000 in the ratio 5 : 7.
- iii. Define percentage.
- iv. Calculate 45% of 900.
- v. Explain simple interest.
- vi. Find domain of  $f(x) = \frac{5}{x-2}$ .
- vii. Write at least two key points of compound interest.
- viii. If  $f(x) = x^2 - x + 5$ , whether  $f(x)$  is even or odd.
- ix. If  $y = 2x + 1$  find slope and y- intercept.

3- Write short answers of any six parts from the following.

2 x 6 = 12

- i. Define reciprocal equation.
- ii. Define an equation.
- iii. Define irrational equation.
- iv. Define identity matrix.
- v. If  $A = \begin{bmatrix} 1 & 4 \\ 2 & 8 \end{bmatrix}$ , then find  $|A|$ .
- vi. Define inverse of a matrix.
- vii. Find  $(11101)_2 + (111)_2$ .
- viii. Convert 27 into binary system.
- ix. If seven times a number is 49 find number.

**Section - II**

NOTE: Attempt any two questions from the following.

8x2=16

4. (a) If the stay of 10 persons for 14 days in a hotel costs Rs.10,000. Find the cost of stay of 6 persons for 7 days.  
(b) In what time will Rs.100000 be Rs.197400 at 12% on compound interest?
5. (a) If  $f(x) = \frac{x}{x+1}$ , find  $f(-2)$ ,  $f(1)$ ,  $f(-1)$  and  $f(2)$ .  
(b) Solve  $2^x + 2^{-x+6} - 20 = 0$ .
6. (a) Expand  $\begin{vmatrix} 3 & -1 & 4 \\ 2 & 7 & 3 \\ 5 & 1 & 2 \end{vmatrix}$ .  
(b) Simplify  $[(100111)_2 + (10101)] - (10111)_2$ .



Roll No. \_\_\_\_\_ (To be filled in by the candidate)

Paper Code	6	6	4	1
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Sessions;2012-2014;2013-2015&amp;2014-2016

**Business Mathematics** (Objective Type)

Time: 20 Minutes

Marks: 15

**NOTE:** Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. The ratio between 80 and 640 is:

- (A) 1 : 10                      (B) 1 : 8                      (C) 1 : 4                      (D) 1 : 2

2. If  $A : B = 2 : 3$  and  $B : C = 3 : 5$  Hence  $A : B : C$  would be:

- (A) 2 : 3 : 5                      (B) 1 : 2 : 3                      (C) 1 : 3 : 5                      (D) 1 : 2 : 5

3. 10% of 300 is:

- (A) 10                      (B) 30                      (C) 100                      (D) 150

4. Principal amount remain constant for calculation of interest for every period in \_\_\_\_\_

- (A) simple interest                      (B) compound interest                      (C) rent                      (D) investment

5. Principal = Rs.5000, interest rate = 10%, period =  $\frac{1}{2}$  year, interest =?

- (A) 1000                      (B) 500                      (C) 250                      (D) 100

6. If  $f(x) = 2x + 26$ , then  $f(20)$ .

- (A) 63                      (B) 64                      (C) 65                      (D) 66

7. If  $f(-x) = f(x)$ , the function is:

- (A) even                      (B) odd                      (C) linear                      (D) quadratic

8. Given that  $x + (x + 8) = 20$ , then value of  $x$  is equal to \_\_\_\_\_.

- (A) 4                      (B) 6                      (C) 8                      (D) 10

9. In quadratic equation, the variable has degree \_\_\_\_\_.

- (A) 0                      (B) 1                      (C) 2                      (D) none

10. Given  $x = y$  and  $2x + y = 3$ , then solution set is:

- (A)  $\{(1,1)\}$                       (B)  $\{(1,2)\}$                       (C)  $\{(2,1)\}$                       (D)  $\{(2,2)\}$

11.  $\begin{bmatrix} 2 & -1 & 3 & 4 \end{bmatrix}$  is a \_\_\_\_\_ matrix.

- (A) row                      (B) column                      (C) null                      (D) none

12.  $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$  is identity matrix of order.

- (A)  $0 \times 0$                       (B)  $1 \times 1$                       (C)  $2 \times 2$                       (D) none

13. If  $\begin{vmatrix} 3 & 4 \\ 3 & x \end{vmatrix} = 0$ , then  $x$  is:

- (A) 2                      (B) 3                      (C) 0                      (D) 4

14. The number system used in computer.

- (A) binary                      (B) decimal                      (C) English                      (D) none

15. convert  $(6)_{10}$  into binary number.

- (A)  $(1001)_2$                       (B)  $(1000)_2$                       (C)  $(111)_2$                       (D)  $(110)_2$

Roll No. \_\_\_\_\_ (To be filled in by the candidate)

Paper Code	6	0	6	4
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Sessions; 2012-2014; 2013-2015 &amp; 2014-2016

# Business Mathematics

 (Essay Type)

Time: 2:10 Hours

Marks: 60

## Section - I

2- Write short answers of any six parts from the following.

2 x 6 = 12

- Write the two uses of ratio.
- What is amount or maturity value?
- Define Annuity.
- A T.V was sold for Rs.4,000 on 5% loss. Find the cost of T.V.
- If the price of 50 shirts is Rs.3652/=. What will be the price of 80 such shirts?
- The cash prize of Rs.5000 has to be distributed between two students in the ratio 2:3. How many does each student receive?
- Find the simple interest on Rs.3000/= at the rate of 8% per year for 5 years?
- Ali got 900 marks out of 1100 marks. Find his percentage of marks.

ix. How long will it take to earn Rs. 11250/= as simple interest on the deposit of Rs.75000/= at 5% annually?

2 x 6 = 12

3- Write short answers of any six parts from the following.

- If  $f(x) = x^2 + 3$ , then find  $f(2), f(3)$ .
- Define Explicit function with one example.
- Solve  $2x^2 - 10x + 5 = 0$ .
- Find the domain and range of  $f(x) = \frac{1}{x-3}$ .
- Express  $\frac{1}{x+4} - \frac{1}{x-4} = 4$  in standard form.
- Eight times of a number is 480. What is the number?
- Find two consecutive integers whose sum is 101.
- Find  $x$ -intercept and  $y$ -intercept of the function  $2x + 3y = 5$ .
- Write formula of discriminant of the quadratic equation  $ax^2 + bx + c = 0, a \neq 0$ .

4- Write short answers of any six parts from the following.

2 x 6 = 12

- Define transpose of a matrix.
- If  $A = \begin{bmatrix} 1 & 2 & 3 \\ -4 & 5 & 6 \end{bmatrix}, B = \begin{bmatrix} -4 & 5 & 6 \end{bmatrix}$ , then find  $3A - 2B$ .
- Find adjoint of matrix  $A = \begin{bmatrix} 1 & 0 \\ 0 & 3 \end{bmatrix}$ .
- If  $A = \begin{bmatrix} 3 & 1 \\ 2 & 0 \end{bmatrix}, B = \begin{bmatrix} 4 & -1 \\ 2 & 3 \end{bmatrix}$ , then find BA.
- Find determinant of  $A = \begin{bmatrix} -3 & -2 \\ 4 & 5 \end{bmatrix}$ .
- Convert  $(11111)_2$  to base 10
- What is the base of binary number system?
- Convert  $(1100011)_2$  to base 10.
- Convert  $(27)_{10}$  to base two.

## Section - II

NOTE: Answer any three questions from the following.

8x3=24

- (a) A is half as old as B and B is half as old as C. The sum of their ages is 105 years. Find their ages separately. 4  
(b) How long will it take for Rs.9800/= amounting to Rs.12650 at 3% p.a. as simple interest? 4
- (a) Find the compound interest on Rs.2500 invested at 6% per annum, compounded semi-annually for 8 years. 4  
(b) If  $f(x, y) = 3x\sqrt{y} - 1$  find  $f(0, 9)$ . 4
- (a) Solve by quadratic formula  $5x^2 - 13x + 6 = 0$ . 4  
(b) Solve by elimination method  $2x + y = 4; x - 2y = 7$  4
- (a) If  $P = \begin{bmatrix} 2 & 1 \\ 3 & 1 \end{bmatrix}, Q = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}, S = \begin{bmatrix} 1 & -2 \\ -6 & 3 \end{bmatrix}$  and  $aP + bQ = S$ . Find the value of a and b. 4  
(b) Solve the system of linear equations by Cramer's rule  $3x + 2y = 12, x + 5y = 17$ . 4
- (a) Convert 1453 into binary system. 4  
(b) Convert  $(1001111)_2$  into decimal form. 4



Roll No. \_\_\_\_\_ (To be filled in by the candidate)

Paper Code 2 8 0 1

**Business Mathematics** (Objective Type) **Session; 2015-2017 & 2016-2018**

Time: 15 Minutes

Marks: 10

**NOTE:** Write answers to the questions on objective answer sheet provided. Four possible answers A, B, C & D to each question are given. Which answer you consider correct, fill the corresponding circle A, B, C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. 1. What percentage of 560 is 28?

- (A) 5% (B) 10% (C) 15% (D) 20%

2.  $-2:7::x:49$ ; the missing term be:

- (A) 8 (B) 12 (C) 14 (D) 16

3. Principal amount = 5000 rupees; rate = 10% period = 1 year; profit is:

- (A) 425 rupees (B) 500 rupees (C) 675 rupees (D) 600 rupees

4. The interval between two successive payments of an annuity remain.

- (A) constant (B) variable (C) fixed (D) both A and B

5. The y-co-ordinate of a point is called:

- (A) abscissa (B) ordinate (C) independent of  $x$  (D) range of  $x$

6. The graph of  $ax^2 + bx + c = 0$  is:

- (A) elliptic (B) parabolic (C) hyperbolic (D) circle

7. The slope intercept form be:

- (A)  $y = mx + c$  (B)  $\frac{x}{a} + \frac{y}{b} = 1$  (C)  $y - y_1 = m(x - x_1)$  (D)  $x \cos \alpha + y \sin \alpha = p$

8. If  $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 0 \end{bmatrix}$  then such matrix is called:

- (A) scalar matrix (B) diagonal matrix (C) identity matrix (D) rectangular matrix

9.  $(AB)^t =$ 

- (A) AB (B)  $A^t B^t$  (C)  $B^t A^t$  (D)  $\frac{1}{AB}$

10.  $(1011)_2$  in decimal system is:

- (A) 12 (B) 15 (C) 28 (D) 11

Roll No. \_\_\_\_\_ (To be filled in by the candidate)

# Business Mathematics Session; 2015-2017 & 2016-2018

(Essay Type)

Time: 1:45 Hours

Marks: 40

## Section - I

2- Write short answers of any six parts from the following.

2 x 6 = 12

- i. Define percentage.
- ii. Define selling price.
- iii. 400 is 10% of what amount?
- iv. Find the value of  $x$  if  $x:5::13:2$ .
- v. Define ordinary annuity.
- vi. Define sum of an annuity.
- vii. Find principal if simple interest is Rs.20 @5% for 2 years.
- viii. Define revenue function.
- ix. Define independent variable.

3- Write short answers of any six parts from the following.

2 x 6 = 12

- i. Solve  $x^2 - 7x - 13 = 0$  by completing the square.
- ii. Solve  $\frac{3x}{8} + 5 = 17$ .
- iii. Solve the equations  $5x + y = 22$  and  $7x - y = 2$ .
- iv. Define upper triangular matrix.
- v. If  $A = \begin{bmatrix} 2 & 1 \\ 6 & 3 \end{bmatrix}$ , then find  $A^{-1}$ .
- vi. Convert  $(1101)_2$  into a decimal number.
- vii. If  $A = \begin{bmatrix} 3 & -1 \\ 2 & 1 \end{bmatrix}$ ,  $B = \begin{bmatrix} -2 & 3 \\ -4 & 5 \end{bmatrix}$ , then find  $(A+B)^t$ .
- viii. Simplify  $(1111)_2 - (1010)_2$ .
- ix. If  $\frac{1}{4}$  of an amount is Rs.160. Find the total amount.

## Section - II

NOTE: Attempt any two questions from the following.

8x2=16

4. (a) Aslam sold a plot for 900000 and received 2% commission. Find amount received by Aslam.  
(b) Find compound interest at end of 5 years Rs.200000 borrowed at 13% compound annually.
5. (a) Solve  $\frac{1}{x+1} + \frac{2}{x+2} = \frac{4}{x+4}$ .  
(b) Convert  $5x + 2y = 10$  it into intercepts form and identify the intercepts.
6. (a) If  $4x + 7y = 140$  and  $3x - 2y = 100$ , find  $x$  and  $y$  by matrix approach.  
(b) Simplify  $[(100111)_2 + (10101)] - (10111)_2$ .





Roll No. \_\_\_\_\_ (To be filled in by the candidate)

Paper Code 2 8 0 5

**Business Mathematics** Sessions; 2015-2017 ; 2016-2018 & 2017-2019  
(Objective Type)

Time: 15 Minutes

Marks: 10

**NOTE:** Write answers to the questions on objective answer sheet provided. Four possible answers A,B,C & D to each question are given. Which answer you consider correct, fill the corresponding circle A,B,C or D given in front of each question with Marker or pen ink on the answer sheet provided.

1. A first degree equation is called:

- (A) Linear (B) Non-linear (C) Quadratic (D) Non-quadratic

2.  $2x^2 + 3x + 1 = 0$  is a:

- (A) linear equation (B) Exponential equation (C) cubic equation (D) quadratic equation

3. A matrix, which has only one column is called:

- (A) column matrix (B) singular matrix (C) square matrix (D) row matrix

4. The determinant of a matrix  $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$  is:

- (A) zero (B) negative (C) one (D) two

5. A decimal number system is also called:

- (A) Binary (B) Greek (C) Octal (D) Denary

6. The relation between two homogeneous quantities is called:

- (A) proportion (B) Annuity (C) Ratio (D) percentage

7. What percentage of 560 is 28?

- (A) 20% (B) 15% (C) 10% (D) 5%

8. Interest is classified into:

- (A) two classes (B) three classes (C) four classes (D) five classes

9. Monthly installment of a motorcar on lease can be found by using:

- (A) compound interest method (B) simple interest method (C) annuity method (D) proportion method

10. The concept of function was introduced in:

- (A) 16
- <sup>th</sup>
- century (B) 17
- <sup>th</sup>
- century (C) 18
- <sup>th</sup>
- century (D) 19
- <sup>th</sup>
- century

Roll No. \_\_\_\_\_ (To be filled in by the candidate)

Sessions; 2015-2017 ; 2016-2018 &amp; 2017-2019

**Business Mathematics** (Essay Type)

Time: 1:45 Hours

Marks: 40

**Section - I**

2- Write short answers of any six parts from the following.

2 x 6 = 12

- i. Simplify the ratio  $\frac{0.5}{0.06} : \frac{7}{8}$  in reduced form.
- ii. Define quantity discount.
- iii. Prove that  $f(x) = x^2 + 4$  is an even function.
- iv. Define annuity due.
- v. If  $f(x) = x^2 - 2x + 1$  then find  $f(-1)$  and  $f(-2)$ .
- vi. 670.8 is what percentage of 13000?
- vii. Write the formula for (a) "compound amount" (b) "compound interest"
- viii. If  $x : \frac{1}{4} :: 12 : 3$  then write this in form of equation and find value of  $x$ .

ix. Find simple interest on Rs.5000/= invested for 4 years at the rate 9% annually.

3- Write short answers of any six parts from the following.

2 x 6 = 12

- i. What is discriminant of  $4x^2 - 13x + 3 = 0$ .
- ii. Define linear equation.
- iii. Solve  $\frac{3x}{8} + 5 = 17$ .
- iv. Solve  $9x^2 = 81$ .
- v. If  $A = \begin{bmatrix} 1 & 2 \\ -1 & 3 \end{bmatrix}$ ,  $B = \begin{bmatrix} -3 \\ 4 \end{bmatrix}$ , find  $AB$
- vi. Define order of a matrix.
- vii. Define transpose of a matrix.
- viii. Define decimal number system.
- ix. Find  $(11011)_2 + (11111)_2$ .

**Section - II**

NOTE: Attempt any two questions from the following.

8x2=16

4. (a) A T.V set of price 10,000/= is available for sale and discount of Rs.500/= Give the purchase price, also the discount price.  
(b) In what amount Rs.30,000/= to Rs.42,348 at 9% on compound interest?
5. (a) Find the slope and y-intercept of the line. If its equation is  $x - y + 4 = 0$   
(b) Solve the equation by completing square  $3x^2 + 6x - 8 = 0$ .
6. (a) If  $A = \begin{bmatrix} 1 & -1 & 2 \\ 0 & 3 & 1 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & 1 \\ 3 & 2 \\ 0 & -1 \end{bmatrix}$  prove that  $(AB)^t = B^t A^t$   
(b) Evaluate  $(1010111)_2 \times (11011)_2$ .