Total No. of Pages : 3

Seat No.	

B.C.A. (Part - II) (Semester - IV) Examination, November - 2015

COMPUTER MATHEMATICS (Paper - 405)

Mathematical Foundation

Sub. Code : 63407

Day and Date : Wednesday, 18 - 11 - 2015 **Total Marks : 80**

Time : 11.00 a.m. to 2.00 p.m.

Instructions :
1) **Question number Eight is compulsory.**
2) **Attempt any four questions from the remaining questions.**
3) **Figures to the right indicate full marks.**
4) **Use of non programmable calculator is allowed.**

Q1) a) Let p : price increases q : demand falls. Express the following statements in the symbolic form using p and q.

i) Price increases, then demand falls

ii) Price increases iff the demand falls.

iii) If demand does not fall, then price does not increase.

iv) If price does not increase, then demand does fall.

b) Define scalar matrix. If $A=\begin{bmatrix}1 & 2 & 2\\ 2 & 1 & 2\\ 2 & 2 & 1\end{bmatrix}$, show that $A^2 - 4A$ is a scalar matrix. **[8 + 8]**

Q2) a) Define cartesian product. If A = {1, 2, 3, 4}, B = {4, 5, 6}, C = {5, 6} find

i) $A\times(B\cup C)$ ii) $(A\times B)\cup(A\times C)$

b) Define the terms: Bipartite graph and complete Bipartite graph. Give an example of each. **[8 + 8]**

Q3) a) Define Determinant of order 3×3 If $\begin{vmatrix} x & 1 & 1 \\ 1 & x & 1 \\ 1 & 1 & 1 \end{vmatrix} = 0$, then find the value of x.

b) Define the term contingency. Show that the statement pattern $(p \leftrightarrow q) \wedge \sim(p \rightarrow \sim q)$ is a contingency. [8 + 8]

Q4) a) Give the meaning of logical equivalence. Using truth table, prove that the statement $p \rightarrow (q \wedge r) \equiv (p \rightarrow q) \wedge (p \rightarrow r)$ is logical equivalence.

b) Define inverse of a matrix. Find inverse of matrix $A = \begin{bmatrix} 2 & 0 & -1 \\ 5 & 1 & 0 \\ 0 & 1 & 3 \end{bmatrix}$. [8 + 8]

Q5) a) State De morgan's laws (any two). If A, B, C are the sets of the letters in the words 'college' 'marriage' and 'luggage' respectively, then verify that $[A - (B \cup C)] = [(A - B) \cap (A - C)]$.

b) Define the terms: Converse and inverse. State the converse, inverse of the following conditional statements.

i) If it rains then the match will cancelled.

ii) If a function is differentiable then it is continuous. [8 + 8]

Q6) a) Explain Isomorphism of graph and give an example of same. Drw a 2 - regular graph on six vertices.

b) Define square matrix. If $A = \begin{bmatrix} 1 & 2 \\ 0 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix}$. Show that $(AB)^2 \neq A^2 B^2$. [8 + 8]

Q7) a) Define the terms: Infinite set and Universal set. If A and B are subsets of the universal set X and n (X) = 50, n (A) = 35, n (B) = 20 and $n(A \cap B) = 10$. Find

i) $n(A \cup B)$ ii) $n(A' \cap B')$

b) Explain matrix representation of graph. Draw a multigraph corresponding to adjacent matrix $\begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 \end{bmatrix}$. [8 + 8]

Q8) a) Define nonsingular matrix. If $A = \begin{bmatrix} 5 & 4 \\ 4 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} -3 & 4 \\ 4 & -5 \end{bmatrix}$ then find |A|, |B| and show that AB is a nonsingular matrix.

b) i) If A = {1, 2, 3}, Write down all possible subsets of A.

ii) Using venn diagram, represent the following: $(A \cup B)'$ and $A \cap B'$.

[8 + 8]

N - 583

Total No. of Pages :3

Seat No.	

B.C.A. (Part - II) (Semester - IV) Examination, April - 2016
MATHEMATICS FOUNDATION
Computer Mathematics (Paper - 405)
Sub. Code: 63407

Day and Date : Saturday, 30 - 04 - 2016 Total Marks : 80

Time :3.00 p.m. to 6.00 p.m.

Instructions :
1) Question number eight is compulsory.
2) Attempt any four questions from remaining questions.
3) Figures to the right indicate full marks.
4) Use of nonprogrammable calculator is allowed.

Q1) a) Define Diagonal matrix. If $A=\begin{bmatrix}4 & -3\\ 2 & 1\end{bmatrix}$ then show that $A^2-5A+10I=0$. Where I is unit matrix. [8]

b) State Idempotent law and give an example of it. Let p: He is tall and q: he is handsome. Write each of the following statement in symbolic form using p and q. [8]

i) He is tall and handsome.

ii) He is tall but not handsome.

iii) He is tall or he is short and handsome.

Q2) a) Define inverse of a matrix. Find inverse of matrix $A=\begin{bmatrix}1 & 2 & 3\\ 1 & 1 & 5\\ 2 & 4 & 7\end{bmatrix}$ by using elementary transformation. [8]

b) Define the terms: subset and finite set. If $A=\{1,2,3,4\}$, $B=\{3,4,5,6\}$, $C=\{4,5,6,7,8\}$ and universal set $X=\{1,2,3,4,5,6,7,8,9,10\}$ then verify the following [8]

i) $A\cup(B\cap C)=(A\cup B)\cap(A\cup C)$.

ii) $(A\cup B)'=A'\cap B'$.

P.T.O.

N - 583

Q3) a) Define the terms: Digraph and pseudo graph. Give an example of each. [8]

b) Define the term contradiction. Using truth table show that the statement pattern $(p \wedge \sim q) \leftrightarrow (p \rightarrow q)$ is a contradiction. [8]

Q4) a) If $A = \begin{bmatrix} 1 & 2 \\ 0 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix}$ then test whether $(A+B)(A-B) = A^2 - B^2$ and verify that $|AB| = |A|.|B|$. [8]

b) Define cartesian product. If $A = \{a, b, c\}$ and $B = \{x, y\}$, then find $A \times B$ and $B \times A$. [8]

Q5) a) Define a determinant of order 3×3. Show that $\begin{vmatrix} 1 & a & -b \\ -a & 1 & c \\ b & -c & 1 \end{vmatrix} = 1 + a^2 + b^2 + c^2$. [8]

b) Define the terms: Complete graph and Bi-partite graph. Draw a 3 - regular graph with six vertices. [8]

Q6) a) From amongst 2000 literate individuals of a town, 70% read Marathi newspapers, 50% read English newspapers and 32.5% read both Marathi and English newspapers. Find the number of individuals who read [8]

i) at least one of the newspapers,

ii) neither marathi nor English newspaper.

b) Explain logical equivalence. Using truth table, prove that the statement $p \wedge q \equiv \sim (p \rightarrow -q)$ is logical equivalence. [8]

Q7) a) Explain matrix representation of graph. Draw a multigraph corresponding to adjacent matrix $\begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 \end{bmatrix}$. [8]

b) State De Morgan's laws (any two) and give an example of each. If $A = \{a, b, c\}$, write all possible subsets of A. [8]

Q8) a) Define scalar matrix and give an example of scalar matrix. If $A = \begin{bmatrix} 4 & 1 \\ 5 & 2 \\ 3 & -4 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -6 & 4 \\ 2 & 0 & 3 \end{bmatrix}$ then find matrix AB and without computing the matrix BA show that $AB \neq BA$. **[8]**

b) Determine the truth values of the following statements. **[8]**

i) $2 + 2 = 7$ if and only if $5 + 1 = 2$.

ii) If $3 + 1 = 4$ then $3 - 2 = 1$.

iii) If is not true that $1 + 1 = 2$ iff $3 + 4 = 5$.

iv) If $3 + 1 = 5$ iff $3 + 4 < 6$.

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Seat No.	

B.C.A. (Part-II) (Semester-IV) Examination, November-2016
MATHEMATICAL FOUNDATION
Computer Mathematics (Paper-405)
Sub. Code : 63407

Day and Date : Thursday, 03-11-2016 **Total Marks : 80**

Time : 10.30 a.m. to 1.30 p.m.

Instructions :
1) **Question No. 8 is compulsory.**
2) **Attempt any four questions from remaining 7 questions.**
3) **Figures to the right indicate full marks.**
4) **Use of non programmable calculator is allowed.**

Q1) a) If p and q are true and r and s are false statements, find the truth value of the following statements:

i) $(p \wedge q) \vee r$ ii) $p \wedge (r \to s)$

iii) $(p \vee s) \leftrightarrow (q \wedge r)$ iv) $\sim (p \wedge \sim r) \vee (\sim q \vee r)$

b) Find the value of x, if $\begin{vmatrix} x+2 & 1 & -3 \\ 1 & x-3 & -2 \\ -3 & -2 & 1 \end{vmatrix} = 0$

[16]

Q2) a) Define the terms: Digraph and weighted graph. Give an example of each.

b) If A and B are subsets of the universal set X and $n(X) = 50$, $n(A) = 35$, $n(B) = 20$ and $n(A \cap B) = 10$, find

i) $n(A \cup B)$ ii) $n(A' \cap B')$

iii) $n(A' \cap B)$ iv) $n(A \cap B')$

[16]

P.T.O.

Q3) a) Define scalar matrix. If $A = \begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then show that $A^2 - 4A$ is a scalar matrix.

b) Define the terms path and cycle in graph theory. Construct a graph of 2-regular graph on 6 vertices.

[16]

Q4) a) Define cartesian product. If $A = \{1, 2, 3\}$, $B = (2, 4\}$ then find

i) $A \times B$ ii) $B \times A$

iii) $(A \times B) \cap (B \times A)$

b) Define Tautology. Using truth table, examine whether the following statement pattern is tautology, contradiction or contingency. $(p \wedge \sim q) \leftrightarrow (p \rightarrow q)$.

[16]

Q5) a) Define inverse of a matrix. Show that inverse of matrix $A = \begin{bmatrix} 2 & 1 & 3 \\ 1 & 0 & 1 \\ 2 & 1 & 1 \end{bmatrix}$ exists and find its inverse.

b) Symbolize the following statements.

i) He swims iff the water is warm

ii) If water is warm then he swim

iii) If water is not warm then he does not swim

iv) He swims and water is warm

[16]

Q6) a) Test whether the following statements are true or false.

i) There exists a 3-regular graph on nine vertices

ii) Every closed walk is a cycle

iii) In any complete graph K_n, number of edges is equal to $\frac{n(n-1)}{2}$

iv) In any graph, the sum of the degrees of all the vertices is equal to twice the number of edges

b) Define the terms: Conjunction and Disjunction. Without using truth table, show that $p \wedge (q \vee \sim p) \equiv p \wedge q$.

[16]

Q7) a) Define power set and obtain power set of $A = \{a, b, c\}$. Using venn diagram represent the following.

i) $A' \cup B'$ ii) $A \cap B'$

b) Define symmetric matrix and give an example of it. If $A = \begin{bmatrix} 5 & 4 \\ 4 & 3 \end{bmatrix}$,

$B = \begin{bmatrix} -3 & 4 \\ 4 & -5 \end{bmatrix}$, find $|A|, |B|$ and show that AB is a nonsingular matrix.

[16]

Q8) a) Define the terms: Subset and Finite set.

If $A = \{1, 2, 3, 4\}$, $B = \{3, 4, 5, 6\}$, $C = \{4, 5, 6, 7, 8\}$ and universal set $X = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$ then verify the following.

i) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

ii) $(A \cap B)' = A' \cup B'$

iii) $n(A \cup B) = n(A) + n(B) - n(A \cap B)$

b) Define square matrix. Show that the matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ satisfy the equation

$A^2 - 5A - 2I = 0$, where I is unit matrix.

[16]

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P-497

Seat No.	

Total No. of Pages : 3

B.C.A. (Faculty of Commerce) (Part - II) (Semester - IV)
Examination, May - 2017
COMPUTER MATHEMATICS (Paper - 405)
Sub. Code : 63407

Day and Date : Saturday, 06 - 05 - 2017 **Total Marks : 80**

Time : 3.00 p.m. to 6.00 p.m.

Instructions :
1) **Question number Eight is compulsory.**
2) **Attempt any Four questions from the remaining questions.**
3) **Figures to the right indicate full marks.**
4) **Use of nonprogrammable calculator is allowed.**

Q1) a) If $A = \begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 1 \\ 2 & 1 \end{bmatrix}$ show that

i) $AB \neq BA$

ii) $(AB)' = B'A'$, where A' is transpose of A.

b) Give meaning of Set. There are 260 persons with a skin disorder. If 150 had been exposed to the chemical A, 74 to the chemical B and 36 to both chemicals A and B, find the number of persons exposed to

i) Chemical A but not chemical B

ii) Chemical A or chemical B

[8 + 8]

Q2) a) Symbolize the following statements:

i) He swims iff the water is warm.

ii) If water is warm then he swim.

iii) If water is not warm then he does not swim.

iv) He swims and water is warm.

b) Define the terms: Complete Graph and Regular Graph. Give an example of each.

[8 + 8]

P.T.O.

Q3) a) Define a determinant of order 3 × 3. Find the value of K, if the value of

$$\begin{vmatrix} 2 & -3 & -2 \\ 1 & 8 & 1 \\ 3 & -K & 5 \end{vmatrix} = 0$$

b) Define the terms:

i) Finite set

ii) Empty set.

If A = {1, 2, 3, 4}, B = {3, 4, 5, 6}, C = {4, 5, 6, 7, 8} and universal set X = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, then verify the following:

i) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

ii) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

[8 + 8]

Q4) a) Define Digraph and Weighted Graph. Draw a 3-regular graph with six vertices.

b) Define the term Tautology. Show that the statement pattern $(p \to q) \vee (q \to p)$ is a tautology.

[8 + 8]

Q5) a) Define cartesian product. If A = $\{a, b, c\}$, B = $\{x, y\}$, find

i) $A \times B$

ii) $A \times A$.

b) If $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}, B = \begin{bmatrix} 5 & 4 \\ 3 & 4 \end{bmatrix}$ then show that $(A + B)(A - B) \neq A^2 - B^2$.

[8 + 8]

Q6) a) Explain the term logical equivalence. Using truth table, prove that the statement $p \wedge q \equiv \sim (p \rightarrow \sim q)$ is logical equivalence.

b) i) Define power set. If {2, 3, 4}, then find the power set of A.

ii) By Venn diagram shade the following sets

1) $(A \cup B)'$

2) $(A - B) \cup (B - A)$

[8 + 8]

Q7) a) Define square matrix. If $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$, find a matrix X such that AX = B.

b) Explain matrix representation of graph. Draw a multigraph corresponding to adjacent matrix $\begin{vmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 \end{vmatrix}$.

[8 + 8]

Q8) a) Define Diagonal matrix. Show that the matrix $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ satisfy the equation $A^2 - 5A - 2I = 0$ and hence find A^{-1}, where I is unit matrix.

b) Determine the truth values of the following statements.

i) 2 + 2 = 7 if and only if 5 + 1 = 2

ii) It is not true that 1 + 1 = 2 iff 3 + 4 = 5

iii) London is in India or 3 + 1 = 4

iv) If 3 + 1 = 5 iff 3 + 4 < 6.

[8 + 8]

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Seat No.	

B - 316

Total No. of Pages : 3

B.C.A. (Part - II) (Semester - IV) Examination, November. - 2017

COMPUTER MATHEMATICS

Mathematical Foundation (Paper -405)

Sub. Code : 63407

Day and Date :Friday, 10 - 11 - 2017

Time : 02.30 p.m to 05.30 p.m. Total Marks : 80

Instructions :
1) Q.No.8 is compulsory.
2) Attempt any Four questions from Q.No.-1 to Q.No.-7.
3) Figures to the right indicate full marks.
4) Use of non programmable calculator is allowed

Q1) a) Define symmetric matrix. If $A=\begin{bmatrix}2 & -1\\ 3 & 1\end{bmatrix}$ and $B=\begin{bmatrix}11\\ 14\end{bmatrix}$ then find the matrix X such that AX = B.

b) There are 260 persons with a skin disorder. If 150 had been exposed to the chemical A, 74 to the chemical B, and 36 to both chemicals A and B. Find the number of persons exposed to (i) chemical A but not chemical B. (ii) chemical A or chemical B. **[8 + 8]**

Q2) a) Define the term Contingency. Let P: He is tall and Q: He is handsome. Write each of the following Statement in symbolic form using p and q. (i) He is tall and handsome (ii) He is tall but not handsome. (iii) He is tall or he is short and handsome.

b) Define Diagonal matrix If $A=\begin{bmatrix}4 & 1\\ 5 & 2\\ 3 & -4\end{bmatrix}$ and $B=\begin{bmatrix}1 & -6 & 4\\ 2 & 0 & 3\end{bmatrix}$ then find AB and without computing the matrix BA show that $AB \neq BA$. **[8 + 8]**

P.T.O.

Q3) a) Define the terms : Finite set and Empty set. If $A = \{1,2,3,4,\}$ $B = \{3,4,5,6\}$, $C = \{4,5,6,7,8\}$ and universal set $X = \{1,2,3,4,5,6,7,8,9,10\}$ then verify the following : (i) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$ (ii) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ (iii) $A = (A \cap B) \cup (A \cap B')$, Where B' is complement of B.

b) Define the terms : Conjunction and Disjunction Using the truth table, prove the following equivalence $p \leftrightarrow q \equiv (p \to q) \Lambda (q \to p)$ **[8 + 8]**

Q4) a) Define inverse of a matrix. Find inverse of matrix

$$A = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 1 & 5 \\ 2 & 4 & 7 \end{bmatrix}$$ by row transformation.

b) Define simple and compound statements. If p is true statement and q is false statement, then find truth value of $(p \to q) \leftrightarrow (\sim q \to \sim p)$ **[8 + 8]**

Q5) a) Define Simple graph and Multigraph. Give an example of each.

b) Define Singular and Nonsingular Matrices. If $A = \begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 1 \\ 2 & 1 \end{bmatrix}$ then show that (i) AB is nonsingular matrix, (ii) $|A|.|B| = |AB|$. **[8 + 8]**

Q6) a) Define the term Cartesian product. If $A = \{1,2,3\}$, $B = \{2,4\}$ then find (i) $A \times B$ (ii) $B \times A$ (iii) $(A \times B) \cap (B \times A)$.

b) Define the terms: Bipartite graph and Complete bipartite graph. Draw a 3 - regular graph with eight vertices. **[8 + 8]**

Q7) a) Define : Tautology and contradiction. Using truth table, Show that

$(p \wedge \sim q) \leftrightarrow (p \rightarrow q)$ is a contradiction.

b) Explain matrix representation of graph. Draw a multigraph corresponding to adjacent matrix $A=\begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 1 & 1 \\ 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 \end{bmatrix}$. **[8 + 8]**

Q8) a) Define Square matrix and Scalar matrix. If $A=\begin{bmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then show that $A^2 - 4A$ is a scalar matrix.

b) Define Venn diagram. By Venn diagram shade the following sets
(i) (A U B)' (ii) A'U B'. **[8 + 8]**

SA - 487

Seat No.	

Total No. of Pages : 4

B.C.A. (Part - II) (Semester - IV) Examination, May - 2018
MATHEMATICAL FOUNDATION (Paper - 405)
(Computer Mathematics)
Sub. Code : 63407

Day and Date : Friday, 04- 05 - 2018 **Total Marks : 80**

Time : 11.00 a.m. to 02.00 p.m.

Instructions :
1) **Question No. 8 is compulsory.**
2) **Attempt any FOUR questions from remaining 7 questions.**
3) **Figures to the right indicate full marks.**
4) **Use of non programmable calculator is allowed.**

Q1) a) Define : Square matrix and Identity Matrix. If $A=\begin{bmatrix}1 & 2\\3 & 4\end{bmatrix}$ then show that $A^2-5A-2I=0$. Where I is unit matrix.

b) Define the terms : Infinite set and empty set. There are 260 persons with skin disorder. If 150 had been exposed to the chemical A, 74 to the chemical B, and 36 to both chemical A and B. Find the number of persons exposed to

i) chemical A but not chemical B,

ii) chemical A or chemical B.

[16]

Q2) a) Give the meaning of conjunction and disjunction using truth table, prove the following equivalence.

$$p \leftrightarrow q \equiv (p \rightarrow q) \wedge (q \rightarrow p).$$

b) Define inverse of a matrix. Obtain the inverse of matrix $A=\begin{bmatrix}2 & -3 & 3\\2 & 2 & 3\\3 & -2 & 2\end{bmatrix}$ by using transformation method.

[16]

P.T.O.

Q6) a) Define complementary set and universal set. If A={1, 2, 3, 4}, B={3, 4, 5, 6}, C = {4, 5, 6, 7, 8} and universal set X = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10}, then verify the following :

i) $A\cup(B\cap C)=(A\cup B)\cap(A\cup C)$

ii) $A\cap(B\cup C)=(A\cap B)\cup(A\cap C)$

iii) $A=(A\cap B)\cup(A\cap B')$

b) State whether the following statements are true or false :

i) In a simple graph with n vertices the degree of each vertex is at the most n-1.

ii) Every closed walk is a cycle.

iii) A circle with centre origin and radius four is a graph.

iv) In any graph, the sum of the degrees of all the vertices is always even.

[16]

Q7) a) Define Diagonal Matrix and give an example. If $A=\begin{bmatrix}2 & -1\\3 & 1\end{bmatrix}$ and $B=\begin{bmatrix}11\\14\end{bmatrix}$ then find the matrix X such that AX = B.

b) Define Disjoint sets with an illustration. By Venn diagram shade the following sets

i) $(A\cup B)'$

ii) $(A-B)\cup(B-A)$

[16]

Q3) a) Define the terms : Complete graph and Bi-partite graph. Give an example of each.

b) Give the meaning of Tautology. Prove that the statement pattern $[p \wedge (p \rightarrow q)] \rightarrow a$ is a tautology.

[16]

Q4) a) Define cartesian product. If $A = \{a, b, c\}$, $B = \{x, y\}$, find

i) A × B

ii) B × A

iii) B × B

b) If $A = \begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 1 \\ 2 & 1 \end{bmatrix}$ then show that

i) $AB \neq BA$

ii) $(AB)' = B'A'$, where A' and B' are the transform matrices of A and B respectively.

[16]

Q5) a) Let P : price increases q : demand falls. Express the following statements in the symbolic form using p and q.

i) Price increases, then demand falls

ii) Price increases iff the demand falls

iii) If demand does not fall, then price does not increase

iv) If price does not increase, then demand does not fall.

b) Define the terms : Multigraph and pseudo graph. Draw a 3-regular graph with eight vertices.

[16]

Q8) a) Define a determinant of order 3 × 3. Find value of x, if $\begin{vmatrix} x & 3 & 3 \\ 3 & 3 & x \\ 2 & 3 & 3 \end{vmatrix} = 0$.

b) Determine the truth values of the following statements

i) 2 + 2 = 7 if and only if 5 + 1 = 2

ii) It is not true that 1 + 1 = 2 iff 3 + 4 = 5

iii) London is in India or 3 + 1 = 4

iv) If 3 + 1 = 4 then 3 – 2 = 1

[16]