Reg.No.

S.No. 485 BATCH: 2009 – 2017

END OF SEMESTER EXAMINATIONS, APRIL / MAY -2018
MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE
SUBJECT CODE: 11UBIT03

MAJOR: B.SC.,(IT) SEMESTER : I
TIME : 3 HOURS 2 MAX.MARKS: 75

SECTION – A (5 X 2 = 10)

Answer ALL Questions:

1. $A=\begin{pmatrix}1 & 0\\ 0 & -1\end{pmatrix}$ and $B=\begin{pmatrix}0 & 1\\ 1 & 0\end{pmatrix}$ then find A.B
2. Let $A=\{1,2,3,4,5\}$ and $B=\{5,6,7\}$ find A-B
3. Let $A=\{2,4,6\}$ and $B=\{1,2\}$ then find $A\times B$.
4. Define Complete Graph.
5. Prove $p\rightarrow q$.

SECTION – B (5 X 4 = 20)

Answer ALL Questions:

6. a) If $A=\begin{pmatrix}1 & 1 & -1\\ 2 & 0 & 3\\ -3 & -1 & 2\end{pmatrix}$, $B=\begin{pmatrix}1 & 3\\ 0 & 2\\ -1 & 4\end{pmatrix}$ and $C=\begin{pmatrix}1 & 2 & 3 & -4\\ 2 & 0 & -2 & 1\end{pmatrix}$ find $(A\cdot B)\cdot C$.

(OR)

b) If $A=\begin{pmatrix}1 & -7 & 8\\ 2 & 5 & 0\\ 11 & 4 & -20\end{pmatrix}$ then find $|A|$.

7. a) If $A=\{c,d\}$, $B=\{1,2\}$, $C=\{2,3\}$ Find (i) $A\times(B\cup C)$ (ii) $(A\times B)\cup(A\times C)$.

(OR)

b) (i) Define: Disjoint Sets. (ii) Given that $A=\{2,4\}$ $B=\{X:X$ is a solution of $x^2+6x+8=0\}$ are A and B are disjoint sets?

8. a) If R is Relation " is greater than" from A to B where $A=\{1,2,3,4,5\}$ $B=\{1,2,6\}$ Find (i) R in the Roster form. (ii) Domain of R (iii) Range of R.

(OR)

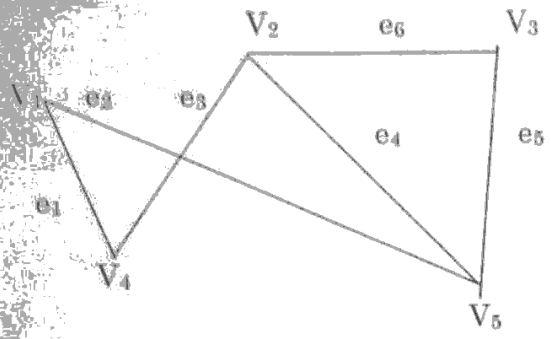
b) Given that A= $\{4,5,6,7\}$ $B=\{8,9\}$, $C=\{10\}$ Verify that $A\times(B\cup C)=(A\times B)\cup(A\times C)$.

..2.

9. a) Define (i) Walk (ii) Cycle.

(OR)

b) Find the Incidence Matrix for the following graph.



10. a) Using Truth Table Solve De Morgan's Law.

(OR)

b) Construct the truth table for the following $\sim P \wedge (P \rightarrow Q)$.

SECTION – C (3 X 15 = 45)

Answer any THREE Questions:

11. Find the Inverse of A.

$$A = \begin{pmatrix} 7 & 2 & 1 \\ 0 & 3 & -1 \\ -3 & 4 & -2 \end{pmatrix}$$

12. If the Universal set is given by $S = \{1,2,3,4,5,6\}$ and $B = \{2,4,5\}$ $C = \{1,5,6\}$ find the following.

a) $A \cup B$

b) $A \cap B$

c) $\overline{A}$

d) $\overline{B}$

e) $A \cap (B \cup C)$ and $(A \cap B) \cup (A \cap C)$

13. Define Equivalence Relation.

b) Let R and S be relations on A. Then prove

(i) If R is Reflexive then $R \cup S$ is Reflexive.

(ii) If R and S are reflexive then $R \cap S$ is Reflexive.

(iii) If R and S are Transitive then $R \cap S$ is transitive.

(iv) If R and S are equivalence Relations, then so is $R \cap S$.

14. Show that (i) If the graph G has a vertex V that is connected to a vertex of the component G_1 and G then V is also a vertex of G_1.

(ii) If F is a cut set of the connected graph G, then G-F has two components.

15. Construct the truth table for the following. $(P \vee R) \times \sim (\sim p \wedge r)$ $(P \vee R) \vee \sim (P \wedge q)$

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