**MID TERM ASSIGNMENT**

**DEPARMENT OF SOFTWERE ENGINEERING**

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**SEMESTER: 2nd**

**COURSE TITLE : DISCRETE STRUCTURE**

**COURSE INSTRUCTOR: SIR ABRAR**

**Q.No.1:**

**Answer:** 1: The Apple Macintosh is a 16 bit computer.

2: There is a largest even number.

3: 8+7=13. (These are the prepositions)

**Q.No.2:**

**Answer:** (a) x ≥ 5

(b) x ≤ 40

(c) 40 < x < 50

(d) x < 50 or x > 40

This is True for all values of x.

(e) x ≥ 50

(f) x ≥ 50 and x ≤ 40.

This can never be True whatever the value of x.

**Q.No.3:**

**Answer:**

**Part (a):**

“Everybody dislikes Maths”.

**Part (b):**

“Neither 2 nor 3 is the answer”.

**Part (c):**

“Someone in my class is short or fat”.

**Q.No.4:**

**1: ¬p V ¬q**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| p | Q | ¬p | ¬q | ¬p V ¬q |
| T | T | F | F | F |
| T | F | F | T | T |
| F | T | T | F | T |
| F | F | T | T | T |

**2: q^ (¬p V q)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| p | Q | ¬p | ¬p V q | q^(¬p V q) |
| T | T | F | T | T |
| T | F | F | F | F |
| F | T | T | T | T |
| F | F | T | T | F |

**3: p^ (q V r)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| p | Q | r | q V r | p^(q V r) |
| T | T | T | T | T |
| T | T | F | T | T |
| T | F | T | T | T |
| T | F | F | F | F |
| F | T | T | T | F |
| F | T | F | T | F |
| F | F | T | T | F |

**4: (p^ q) V r**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| p | Q | r | p ^ q | (P ^q) V r |
| T | T | T | T | T |
| T | T | F | T | T |
| T | F | T | F | T |
| T | F | F | F | F |
| F | T | T | F | T |

**Q.no.5:**

**Answer:**

**¬ ((p V q) V (r ^ (p V ¬q)))≡ ¬p ^ q**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| p | q | r | ¬p | ¬q | p V ¬q | r^(pV¬q) | ((pVq)V(r^(pV¬q) | ¬(((pV¬q)V(r^(pVq))) | ¬p^q |
| T | T | T | F | F | T | T | T | F | F |
| T | T | F | F | F | T | F | T | F | F |
| T | F | T | F | T | T | T | T | F | F |
| T | F | F | F | T | T | F | T | F | F |
| F | T | T | T | F | F | F | F | T | T |
| F | T | F | T | F | F | F | F | T | T |
| F | F | T | T | T | T | T | T | F | F |

**Q.No.6:**

**( z ^ w) V (¬z ^ w) V (z ^ ¬ w) ≡ z V w**

**Answer:** ( z ^ w) V (¬z ^ w) V (z ^ ¬ w)=(z^¬w) V (z^¬w) V (¬z^ w) ***Commutative Law***

=(z^(w V ¬w))V(¬z^w) **Distributive Law**

= (z^ T) V (¬z^ w) **Identity Law**

=(z V ¬z) ^ (z V w) **Distributive Law**

=T^(z V w) **Complement Law**

=(z V w) ^T **Commutative Law**

=z V w **Identity Law**

**THE END**