

**Iqra National University**

**Class BS Software Engineering Section B**

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**Subject DISCRETE STRUCTURE**

 **Semester (2)**

 **Submitted to M.Abrar**

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Q1: Which of the following are preposition?

**Answer:**

B) The apple Macintosh is a 16-bit computer.

C) There is a largest even number.

E) 8+7=13

**These are preposition.**

Q2: P IS “X<50”;Q IS “X>40”

Write as simply as you can.

**ANS: OPTION (D) IS A RIGHT ANSWER. P V Q X<50 OR X>40 THIS IS TRUE FOR ALL VALUES OF X.**

Q3:

ANS: In part A the definition correspond to the preposition **~**P is

1. **“everybody dislikes maths”**

In part B the definition corresponds to the preposition **~**P is

1. **“Neither 2 nor 3 is the answer”**
2. **The answer is not 2 and it is not 3**

In part C definition correspond to the preposition **~**P is

1. “**Someone in my class is short or fat.**

**Q4: CONSTRUCT TRUTH TABLE FOR THE FOLLOWING.**

ANS:

1. **~p v ~q**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| P | Q | ~P | ~Q | ~PV~Q |
| F | F | T | T | T |
| F | T | T | F | T |
| T | F | F | T | T |
| T | T | F | F | F |
| **B: Q^(~PVQ)** |
| P | Q | ~P | ~PVQ | Q^(~PVQ) |
| F | F | T | T | F |
| F | T | T | T | T |
| T | F | F | F | F |
| T | T | F | T | T |
| C: **P^(QVR**) |
| P | Q | R | QVR | P^(QVR) |
| F | F | F | F | F |
| F | F | T | T | F |
| F | T | F | T | F |
| F | T | T | T | F |
| T | F | F | F | F |
| T | F | T | T | T |
| T | T | F | T | T |
| T | T | T | T | T |

|  |
| --- |
| **D: (P^Q)VR** |
| P | Q | R | P^Q | (P^Q)VR |
| F | F | F | F | F |
| F | F | T | F | T |
| F | T | F | F | F |
| F | T | T | F | T |
| T | F | F | F | F |
| T | F | T | F | T |
| T | T | F | T | T |
| T | T | T | T | T |

Q5: USE TRUTH TABLE TO SHOW THAT?

**~((PV~Q)V(R^(PV~Q)))= ~P^Q**

ANS: R.H.S = **~P^Q**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| P | Q | R | ~P | ~P^Q |
| F | F | F | T | F |
| F | F | T | T | F |
| F | T | F | T | T |
| F | T | T | T | T |
| T | F | F | F | F |
| T | F | T | F | F |
| T | T | F | F | F |
| T | T | T | F | F |

**L.H.S**: ~((PV~Q)V(R^(PV~Q)))

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| P | Q | R | ~Q | (PV~Q) | R^(PV~Q) | ~((PV~Q)V(R^(PV~Q))) |
| F | F | F | T | T | F | F |
| F | F | T | T | T | T | F |
| F | T | F | F | F | F | T |
| F | T | T | F | F | F | T |
| T | F | F | T | T | F | F |
| T | F | T | T | T | T | F |
| T | T | F | F | T | F | F |
| T | T | T | F | T | T | F |

**HENCE PROVE THAT R.H.S=L.H.S**

**Q6: (z ^ w) v (~z ^ w) v (z^ ~w) = z v w**

**ANS: (z ^ w) v (~z ^ w) v (z^ ~w) = z v w**

**= (Z ^ W) V (Z ^ ~W) V (~Z ^ W) = According to commutative law.**

**= (Z ^ (WV ~ W) V (~Z ^ W) = According to distributive law.**

**= (Z ^ T) V (~Z ^ W) = According to complement law.**

**= ZV (~Z ^ W) = According to identity law.**

**= (ZV ~ Z) ^ (Z V W) = According to distributive law.**

**= T ^ (Z V W) = According to complement law.**

**= (Z V W) T = According to commutative law.**

**=zvw = identity law. ANS…..**

The end……