Q3 In each Part of this question a Proposition P is defined. Which of the Statement that follows the definition Correspond to the Proposition ~P(

(a) P is "Some People like Maths"
(a) "Some People dislike Maths"
(b) "Everybody dislikes Maths"
(c) "Every body Likes Maths"

Answer .(b) "Everybody dislike Maths"

(b) P is "The answer is either 2 or 3"
(a) "Neither 2 nor 3 is the answer
(b) "The answer is not 2 or it is not 3
(c) "The answer is not 2 and it is not 3"

Answer :- 1 and c

In Part A (b) is Preposition.
In Part B (1) and (c) both are Preposition

(c)
In Part C (c) is Preposition.
(c) "Someone in my class is short or fat"

Q4

Construct truth table for

a) $\neg p \vee \neg q$

p	q	$\neg p \vee \neg q$
F	F	T
F	T	T
T	F	T
T	T	F

b) $q \wedge (\neg p \vee q)$

p	q	$q \wedge (\neg p \vee q)$
F	F	F
F	T	T
T	F	F
T	T	T

c) $P \wedge (q \vee r)$

P	Q	R	$(q \vee r)$	$P \wedge (q \vee r)$
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

Q1 Which of the following are Proposition?

(a) Buy Premium Bonds!
(b) The Apple Macintosh is a 16 bit Computer.
(c) There is a Largest even number
(d) Why are we here?
(e) $8 + 7 = 13$
(f) $a + b = 13$

Ans • B and C
e and f

Q2 p is "$x < 50$"; q is "$x > 40$"

write as Simply as you Can

a) $\neg p$
b) $\neg q$
c) $p \wedge q$
d) $p \vee q$
e) $\neg p \wedge q$
f) $\neg p \wedge q$

Answer:- (a) $x \geq 50$
(b) $x \leq 40$
(c) $40 \leq x < 50$
(d) $x \leq 50$ or $x > 40$
(e) $x \geq 50$
(F) $x \geq 50$ and $x \leq 40$

Q.6

use the laws of logical Propositions to prove that

$(Z \wedge W) \vee (\neg Z \wedge W) \vee (Z \wedge \neg W) \equiv Z \vee W$

State the name of each law used in each stage.

$(Z \wedge W) \vee (\neg Z \wedge W) \vee (Z \wedge \neg W) = (Z \wedge W) \vee (Z \wedge \neg W) \vee (\neg Z \wedge W)$ Commutative law

$= (Z \wedge W) \vee (Z \wedge \neg W) \vee (\neg Z \wedge W)$ Commutative law

$= [Z \wedge (W \vee \neg W)] \vee (\neg Z \wedge W)$ Distributive law

$= (Z \wedge T) \vee (\neg Z \wedge W)$ Complement law

$= Z \vee (\neg Z \wedge W)$ Identity law

$= (Z \vee \neg Z) \wedge (Z \vee W)$ Distributive law

$= T \wedge (Z \vee W)$ Complement law

$= (Z \vee W) \wedge T$ Commutative law

$= Z \vee W$ Identity law

d) $(p \wedge q) \vee r$

P	Q	R	$(p \wedge q)$	$p \wedge q$
T	T	T	T	T
T	T	F	T	T
T	F	T	F	F
T	F	F	F	F
F	T	T	F	F
F	T	F	F	F
F	F	T	F	F
F	F	F	F	F

Q5 use truth tables to show that $\neg((p \vee \neg q) \vee (r \wedge (p \vee \neg q))) \equiv \neg p \wedge q$

P	Q	$\neg q$	$\neg(p \vee \neg q)$	$(r \wedge (p \vee \neg q))$	$\neg(r \wedge$
T	T	T	F	F	F
T	T	F	F	F	F
T	F	T	F	F	F
T	F	F	F	F	F
F	T	T	T	T	T
F	T	F	T	F	T
F	F	T	F	F	F
F	F	F	F	F	F