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$\longleftrightarrow$

Q NO 1:

which of the following are preposition

a) Buy Premium Band
b) The apple marcintosh is a 16 bit computer
c) There is a largest even number
d) why we are here
e) $8+7=13$
f) $a+b=13$

Ans $\boxed{\text{B and C}}$

Q NO 2:

p is $x<50$, q is "$x>40$"

Write as simply as you can

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

Answer:

a) $x \geq 50$
b) $x \leq 40$
c) $40 < x < 50$
d) $x < 50$ or $x > 40$
e) $x \geq 50$
f) $x \geq 50$ and $x \leq 40$

(2)

Q NO 3: In each part of the Question a preposition p is defined which of the statement corresponding to the preposition (~p).

(a)

p = is some people like Maths

(a) Some people dislike Maths.
(b) Everybody dislike Maths.
(c) Every body likes Maths.

Ans: (B) is preposition.
"Every body 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"

Ans

(A) and (C) both are preposition.

(C) p is "All people in my class are tall and thin"

a) Someone in my class is short and fat
b) No-one in my class in tall and tin
c) some one in my class is shot ~~and~~ fat.

Answer: (C) is the preposition "Someone in my class is short or fat"

P.T.O

Q no 4,

construct truth table for

a) $\sim p \vee \sim q$

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

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

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

Ans.

(a) $(\sim p \vee \sim q)$

p	q	$\sim p$	$\sim q$	$\sim p \vee \sim q$
T	T	F	F	F
F	T	T	F	T
T	F	F	T	T
F	F	T	T	T
T	T	F	F	F

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

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

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

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

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

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

Q NO 5 :

P.T.O

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Q NO 5:

use the truth table to show

$$\sim((p \vee \sim q) \vee (r \wedge (p \vee \sim q))) \equiv \sim p \wedge q$$

Ans, $\sim((p \vee \sim q) \vee (r \wedge (p \vee \sim q))) = \sim p \wedge q$

p	q	r	$\sim q$	$p \vee \sim q$	$\sim(p \vee \sim q)$	$r \wedge (p \vee \sim q)$	$\sim(p \vee \sim q) \vee (r \wedge (p \vee \sim q))$	$\sim p \wedge$
T	T	T	F	T	F	T	T	T
T	F	T	T	T	F	T	T	T
F	T	T	F	F	T	F	T	T
F	F	F	T	T	F	F	F	F
T	T	F	F	T	F	F	F	F
F	F	F	T	T	F	F	F	F

Hence proved.

Q NO 6:

use the law of logical propositions to prove that

$$(z \wedge w) \vee (\sim z w) \vee (z \wedge \sim w) = z \vee w$$

state carefully each law used each stage

Ans

p.t.o

(6).

$(Z \wedge W) \vee (\sim Z \wedge W) \vee (Z \wedge \sim W) = (Z \wedge W) \vee (Z \wedge \sim W) \vee (\sim Z \wedge W)$

$= (Z \wedge W) \vee (Z \wedge \sim W) \vee (\sim Z \wedge W)$

commulative law

$= (Z \wedge (W \vee \sim W)) \vee (\sim Z \wedge W)$

Distrabulive law

$= (Z \wedge T) \vee (\sim Z \wedge W)$

complement law

$= Z \vee (\sim Z \wedge W)$

Identity law

$= (Z \vee \sim Z) \wedge (Z \vee W)$

Distributive law

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

$= (Z \vee W) \; T$

commutative law

$= Z \vee W$

Identity law

Hence proved