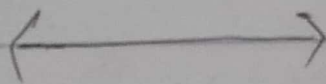


(2)

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Q NO 1:

Which of the following are prepositions

- a) Buy Premium Band
- b) The apple macintosh 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

B and C

Q NO 2:

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

write a) 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 correspond to the preposition ($\sim P$).

(A)

- P = is some people like Maths
- (a) some people dislike Maths.
 - (b) ~~Every body dislike Maths.~~
 - (c) Every body like 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 is tall and thin
 - c) ~~someone in my class is short and fat.~~

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

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(3)

Q no 4,

consider both 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 |

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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 nos :
=

P.H.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,

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

| p | q | r | $\sim q$ | $p \vee \sim q$ | $\sim(p \vee \sim q)$ | $r \wedge (p \vee \sim q)$ | $\sim(p \vee \sim q) \vee (r \wedge (p \vee \sim q))$ | $\sim p \wedge q$ |
|---|---|---|----------|-----------------|-----------------------|----------------------------|---|-------------------|
| 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

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

state carefully each law used
each stage

Ans

pv

6.

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

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

commutative law

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

Distributive 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

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

commutative law

$$= Z \vee W$$

Identity law

Hence proved

