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Subject : Discrete structure

Program : BS(CS)

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①

PART - A. Question No: 2

Answer:

P	Q	R	$P \vee Q$	$(P \wedge R) \wedge R$	$(Q \vee R)$	$P \wedge (Q \vee R)$
T	T	T	T	T	T	T
T	T	F	T	F	F	F
T	F	T	F	F	F	F
T	F	F	F	F	F	F
F	T	T	F	F	T	F
F	T	F	F	F	F	F
F	F	T	F	F	F	F
F	F	F	F	F	F	F

Hence it is not a tautology

P	Q	$(P \wedge R)$	$\neg P$	$\neg Q$	$(P \wedge \neg Q)$	$(\neg P \vee (P \wedge R))$	$(P \wedge R) \vee \neg P$
T	T	T	F	F	F	F	T
T	F	F	F	T	T	T	T
F	T	F	T	F	F	T	T
F	F	F	T	T	T	T	T

Hence it is a tautology

(2)

PAPT = B:

Answer:-

Express in Proposition

(i)  $P \rightarrow Q$

(ii)  $\neg Q \rightarrow \delta$

(iii)  ~~$\neg P \rightarrow \delta$~~

$(\neg P \wedge \neg Q) \rightarrow \delta$ :

Question - No - 2  
Part - A

P	Q	$(P \rightarrow Q)$	$(P \rightarrow Q) \vee$	$[(P \rightarrow Q) \wedge Q] \rightarrow Q$
T	T	T	T	T
T	F	F	F	T
F	T	T	T	F
F	F	T	F	T

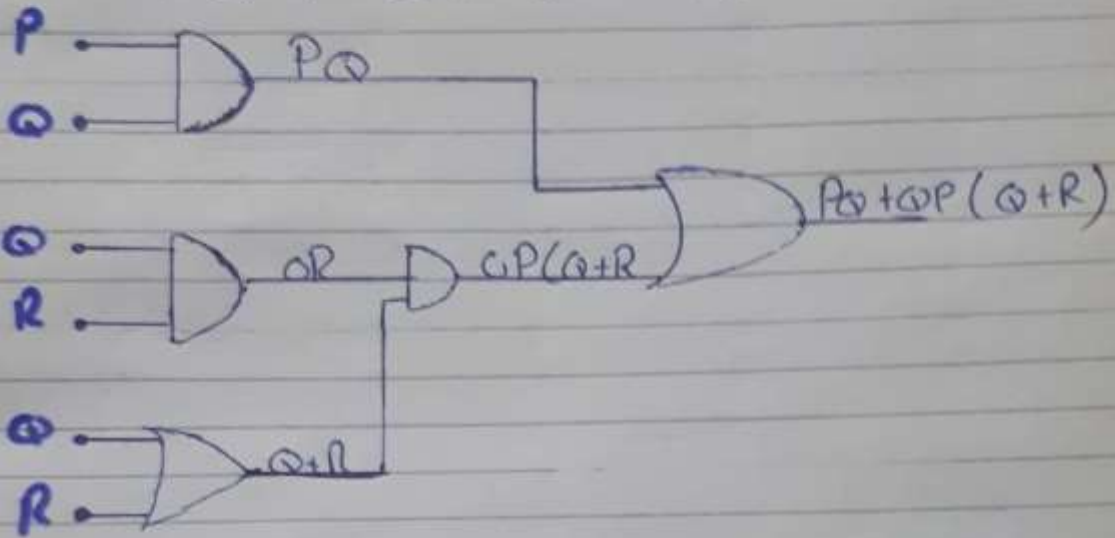
Since its this the argument as a single statement is not always true we could say the argument is invalid so that is exactly the conclusion the question was whether or not the argument is valid or not the answer is invalid.

(3)

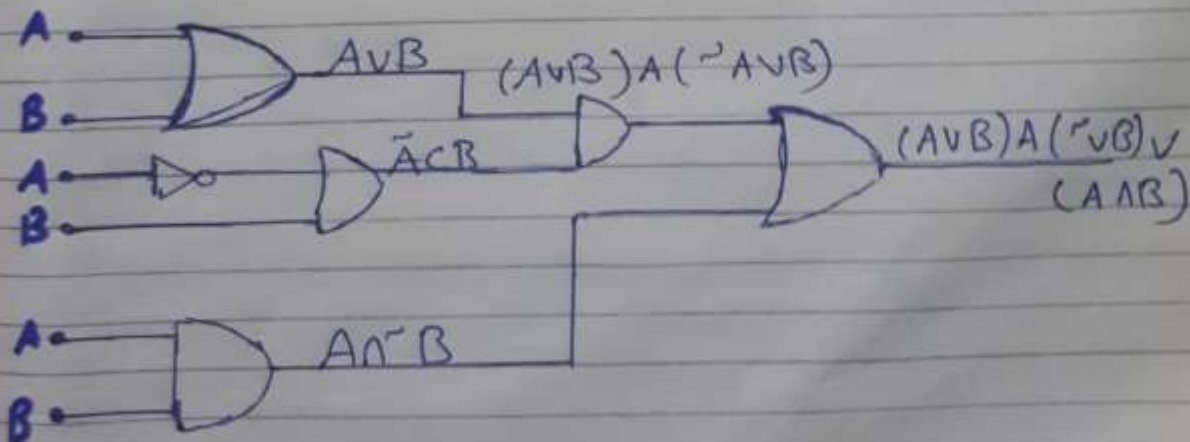
### Question No 2.

#### Part B

1:-  $PQ + QR(Q+R)$



2:-  $(A \vee B) \wedge (\sim A \vee B) \vee (A \wedge \sim B)$



(4)

Part (A)  
Question No 5.  
Answer:

$$A = \{ a, b, c \}$$

$$B = \{ 1, 2, 3, 4, 5 \}$$

$$P(A) = \{ \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{b, c\}, \{a, c\}, \{a, b, c\} \}$$

$$P(B) = \{ \emptyset, \{1\}, \{2\}, \{3\}, \{4\}, \{1, 2\}, \{2, 3\}, \{3, 4\}, \{1, 2, 3\}, \{2, 3, 4\}, \{1, 2, 3, 4\} \}$$

Ans

Part (B)

Answer:

(i) Tabular Form:

Listing all the elements of a set separated by commas and enclosed within braces or curly brackets  $\{ \}$ .

Example:

$A = \{ 1, 2, 3, 4, 5 \}$  is the set of first five Natural Number



(5)

$B = \{2, 4, 6, 8, \dots, 50\}$  is the set of Even Numbers up to 50.

### (2) Descriptive Form:-

words the elements standing in  
a set of

#### Example:-

$A =$  Set of First Five Natural Number

$B =$  Set of Positive even integers less or equal to fifty

### 3:- SET BUILDER FORM:-

Symbolic Form the working in common

Characteristics shared by all the elements of the set

#### Example:-

$$A = \{x \in \mathbb{N} \mid x \leq 5\}$$

$$B = \{x \in \mathbb{E} \mid 0 < x \leq 50\}$$