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BSc(SE)

Semister \Rightarrow 4th

Section \Rightarrow "A"

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①

Question no: 01

ei. Answer

Show that $(P \wedge q) \wedge r \equiv P \wedge (q \wedge r)$ and $(P \wedge q) \vee (\sim P \vee (P \wedge q))$ is a tautology

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

$$(P \wedge q) \wedge r \equiv P \wedge (q \wedge r)$$

$$(P \wedge q) \vee (\sim P \vee (P \wedge q))$$

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

≡ Hence Proved Tautology ≡

(2)

Part = "b"

Let p, q and r be the proposition
where $p =$ "you have the flu" $q =$ "you miss

the final exam" and $r =$ "you pass the course" Express
the English sentence as propositions

(1) if you have flu, then you will miss the final
exam

(2) if you don't miss the final exam, you will
pass the course.

(3) if you neither have flu nor miss the final
exam, then you will pass the course.

(ANSWER)

(1) $\rightarrow p \rightarrow q$

(2) $\rightarrow \neg q \wedge r$

(3) $(\neg p \wedge \neg q) \wedge r$

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Q No. 2.

(a) Show that the given argument from is invalid $p \rightarrow q$ q $\therefore p$ with the help of truth table.

(b) Draw circuit diagram for 1. $PQ + QR$
2. $(A \vee B) \wedge (\sim A \vee B) \vee (A \wedge \sim B)$

ANSWER

$p \rightarrow q$

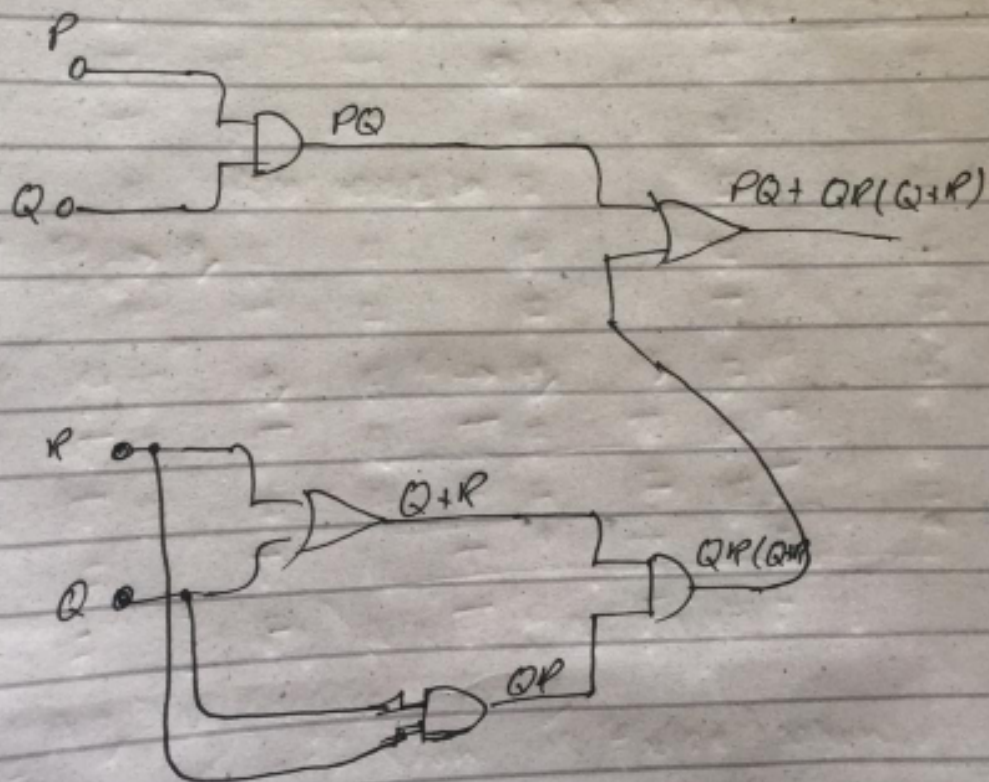
P	q	$p \rightarrow q$	q	P
T	T	T	T	T
T	F	F	F	T
F	T	T	T	F
F	F	T	F	F

The conclusion is false when the premises $p \rightarrow q$ and q are true, therefore the argument is invalid.

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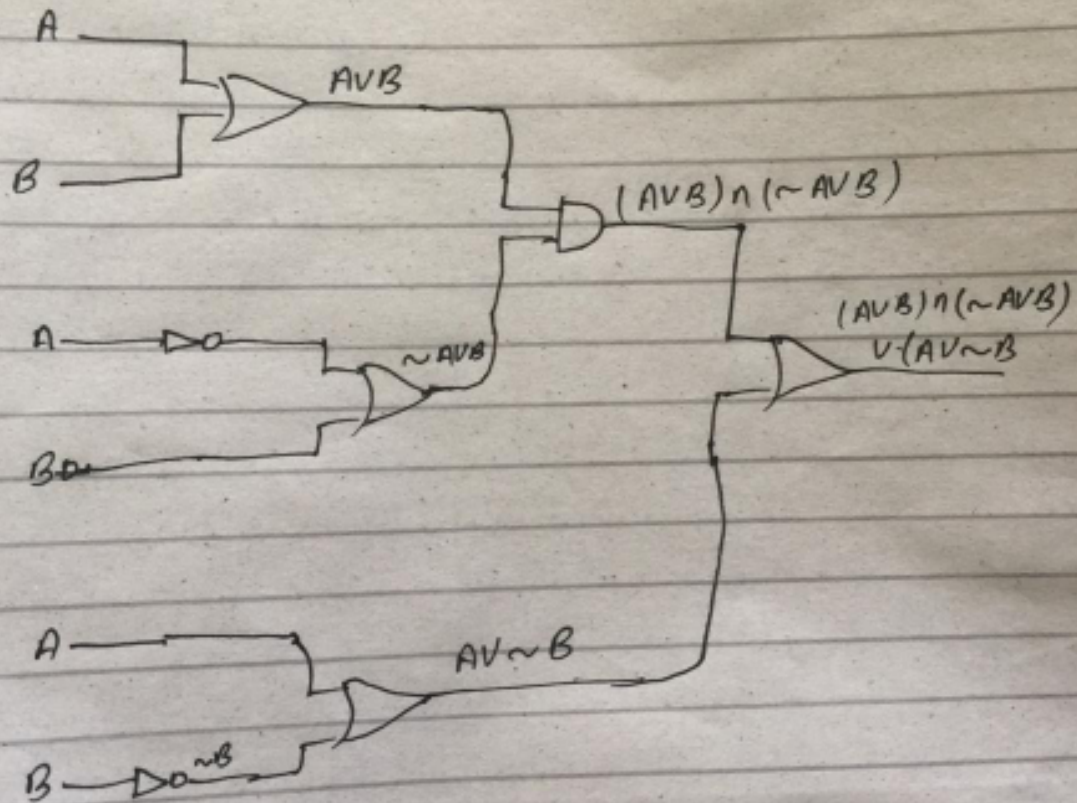
Q 2. Part (b)

circuit diagram $PQ + QR(Q+R)$



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



(6)

Question No: 03

-: Answer :-

if $A = \{a, b, c\}$ and $B = \{1, 2, 3\}$
find $P(A)$ and $P(B)$

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

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

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

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

(7)

Part: \rightarrow b

Answer: -

Q: Three forms of Set:

1" Finite set

A set consisting of a natural number of objects i.e. in which number element is finite is said to be a finite set. Consider the sets.

$$A = \{5, 7, 9, 11\} \text{ and } B = \{4, 8, 16, 32, 64, 128\}$$

Obviously, A, B contain a finite number of elements, i.e. 4 objects in A and 6 in B, thus they are finite sets.

(3) Infinite Set:

If the number of elements in a set is finite, the set is said to be an infinite set.

Thus the set of all natural numbers is given by $N = \{1, 2, 3, \dots\}$ is an infinite set. Similarly the set of all rational numbers between 0 and 1 given by $A = \{x: x \in \mathbb{Q}, 0 < x < 1\}$ is an infinite set.

(3)

(8)

3) Null set / empty set

A Null set or an empty set is a valid set with no member.

$A = \{ \}$ / ϕ Cardinality of A is 0

there is two popular representation either empty curly braces $\{ \}$ or a special symbol ϕ . this A is a set which has null set inside it.