

## Section - 1

Q2 Tautology  $\Rightarrow$  Tautology is defined as a compound proposition that is always true for all possible truth values of its propositional variables and it contains T in last column of its truth table

Propositions like,

- i) The doctor is either male or female.
- (ii) Either it is raining or not.

2) Contradiction - is defined as a compound proposition that is always false for all possible truth values of its propositional variables and it contains F in last column of its truth table.

Propositions like,

- i)  $n$  is even and  $n$  is odd number  
Tom is good boy and Tom is bad boy

3) Contingency - A proposition which is neither tautology nor contradiction is called contingency.

Here the last column of truth table contains both T and F

$$\text{Proof } \Rightarrow (p \vee q) \vee (\neg p \vee r) \rightarrow (q \vee r)$$

$P$	$Q$	$r$	$\sim P$	$(P \vee Q)$ = A	$(\sim P \vee r)$ = B	$(A \vee B)$ = C	$Q \vee r$ = D	$C \rightarrow D$
F	F	F	T	F	T	T	F	F
F	F	T	T	F	T	T	T	T
F	T	F	T	T	T	T	T	T
F	T	T	T	T	T	T	T	T
T	F	F	F	T	F	T	F	F
T	F	T	F	T	T	T	T	T
T	T	F	F	T	F	T	T	T
T	T	T	F	T	T	T	T	T