7th Dec.

1 "If you send me an email message then I will finish writing the program."
"If you do not send me an email msg I will go to sleep early."
4 "If I go to sleep early then I will wake up feeling refreshed."

lead to conclusion "If I do not finish writing the ~~exam~~ prog then I will wake up feeling refreshed."

Propositions:

- p = you send me an email message
- q = I will finish writing program
- r = I will go to sleep early
- s = I will wake up feeling refreshed

Hypothesis:

$p \rightarrow q$

$\neg p \rightarrow r$

$r \rightarrow s$

conclusion:

$\neg q \rightarrow s$

S.N.	Statement	Reason
1	$p \rightarrow q$	Hypothesis
2.	$\neg q \rightarrow \neg p$	Contrapositive (logical equivalence) of (i)
3	$\neg p \rightarrow r$	Hypothesis
4	$\neg q \rightarrow r$	Using hypothetical syllogism of (2) & (3)
5.	$r \rightarrow s$	Hypothesis
6.	$\neg q \rightarrow s$	Hypothetical syllogism

2. "Pawan will go to PKR or Lumbini.", "If he goes to Lumbini, he will not visit Sarankot.", "If he doesn't visit Sarankot, he will go to Tilaurakot.", "He did not go to PKR."

implies conc. "He visited Tilaurakot"

Propositions:

p = Pawan will go to PKR

q = Pawan will go to Lumbini

r = He will visit Sarankot
s = He will visit Tilaurakot

Hypothesis:

$p \vee q$

$q \rightarrow \neg r$

$\neg r \rightarrow s$

$\neg p$

Conclusion:

s.

S.N.	Statement	Reason
1.	$p \vee q$	Hypothesis
2.	$\neg p$	Hypothesis
3.	q	Disjunctive syllogism
4.	$q \rightarrow \neg r$	Hypothesis
5.	$\neg r \rightarrow s$	Hypothesis
6.	$q \rightarrow s$	Hypothetical syllogism

7.	S	using modus ponens in (3) & (6)

Resolution principle

↳ way of proving an argument is correct

① only disjunction ← implies, conjuction .... sab lai disjunction ma garne

② clause 1, 2 vanera aauxa.

③ variables ∀ ∃ called → literals

④ conclusion always → in negation.

C1 : P
C2 : ¬P ∨ Q
C3 : ¬Q ——→ conclusion (so ¬)

C4 : Q [from C1 & C2]
C5 : □ [from C3 & C4]

↓

yo vane correct

1. "If today is Tuesday, I have a test in maths or economics." "If my eco prof is sick, I will not have a test in eco." "Today is Tuesday and my eco prof is sick" "therefore, I have a test in mathematics."

conclusion

Propositions:

- p = Today is Tuesday
- q = I have test in maths
- r = I have test in Eco
- s = my eco prof is sick

Hypothesis:

$p \rightarrow (q \vee r)$ → $p \rightarrow q \equiv \neg p \vee q$

$s \rightarrow \neg r$

$p \wedge s$

Conclusion:

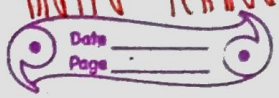
q

Clause		Reason
C1: $\neg p \vee (q \vee r)$	→ $p \rightarrow q \equiv \neg p \vee q$	Hypothesis
C2: $\neg s \vee \neg r$		Hypothesis

C3: C4: C5: C6: C7: C8: C9:

2.

$p \wedge q \Rightarrow p$ matra lekhda $\vee$
q matra lekhda $\vee$



C3: p — using simplification in $p \wedge s$

C4: s — using simplification in $\neg r \wedge s$

C5: $\neg q$ — Negation of conclusion

C6: $\neg p \vee q \vee \neg s$ — From C1 & C2 $r \& \neg r$ kotiyo

C7: $q \vee \neg s$ — From C3 & C6

C8: q — From C4 & C7

C9: $\square$ — From C5 & C8

2. "It is not raining or sita has her umbrella." "sita does not have her umbrella or she doesn't get wet." "It is raining or sita doesn't get wet."
implies
"sita does not get wet."

Propositions:
- p = It is raining
- q = sita has her umbrella
- r = sita gets wet

Hypothesis:

$\neg p \vee q$ $\quad$ $p \vee \neg r$

$\neg q \vee \neg r$

Conclusion: 7r