LAB-10 :-

① → Resolution in FOL :-

Q Given the KB or Premises :

John likes all kind of food.
Apple and vegetables are food.
Anything anyone eats and not killed is food.
Anil eats peanuts and still alive.
Harry eats everything that Anil eats.
Anyone who is alive implies not killed
Anyone who is not killed implies alive.

⟹ **Prove by resolution that :**

John like peanuts.

Sol

Step1 Eliminate implication

(a) $\forall x : food(x) \rightarrow likes(John, x)$
(b) $food(Apple) \land food(vegetables)$
(c) $\forall x \forall y : eats(x, y) \land \rightarrow killed(x) \rightarrow food(y)$
(d) $eats(Anil, Peanuts) \land alive(Anil)$
(e) $\forall x : eats(Anil, x) \rightarrow eats(Harry, x)$
(f) $\forall x : killed(x) \rightarrow alive(x)$
(g) $\forall x : alive(x) \rightarrow \rightarrow killed(x)$
(h) $likes(John, Peanuts)$

Step II

(a) $\forall x \neg food(x) \lor likes(John, x)$.

(b) $food(Apple) \land food(vegetables)$

(c) $\forall x \forall y \neg [eats(x, y) \land \neg killed(x)] \lor food(y)$

(d) $eats(Anil, Peanuts) \land alive(Anil)$

(e) $\forall x \neg eats(Anil, x) \lor eats(Harry, x)$

(f) $\forall x \neg [\neg killed(x)] \lor alive(x)$

(g) $\forall x \neg alive(x) \lor \neg killed(x)$

(h) $likes(John, Peanuts)$,

Step III

Move negation $(\neg)$ inwards.

(a) $\forall x \neg food(x) \lor likes(John, x)$

Applying Resolution.

(i) From (4):
$Eats(Anil, Peanuts) \land \neg killed(Anil)$

(ii) From (3):
Substitute $y = Anil$, $x = Peanuts$:
$\neg Eats(Anil, Peanuts) \lor killed(Anil) \lor food(Peanuts)$

Resolve with $Eats(Anil, Peanuts)$:
$killed(Anil) \lor Food(Peanuts)$
Resolve with $\neg killed(Anil)$:
$Food(Peanuts)$

(iii) From [1]:
Substitute $x = Peanuts$:
$\neg Food(Peanuts) \lor Likes(John, Peanuts)$

Resolve with Food (peanuts),
likes (John, peanuts)

(iv) Negation of goal ﬃ' likes (John, peanuts) is resolved.

→ Output :

By resolution, likes (John, peanuts) is proven.