

Indian Institute of Engineering Science and Technology, Shibpur

8th Semester B. Tech. CST Final Examination, 2021

Artificial Intelligence (CS-801)

Full Marks-30

Time- 45 minutes.

Answer all Questions

1. a) Convert the following Natural Language sentence into clause form choosing appropriate predicate(s) as necessary :

If person a is a friend of person c then there exists a person b such that a is a friend of b and b is a friend of c.

- b) Convert the following into clause form.

$$\forall x (\forall y P(x,y)) \rightarrow \neg (\forall y Q(x,y) \rightarrow R(x,y)) \quad [5+5]$$

2. a) If taxes are raised, then revenue will be generated. However, if unemployment increases, then people will be unhappy. Use resolution in Propositional Logic to prove that if taxes are raised and unemployment increases, then revenue will be generated but people will be unhappy.

- b) Consider the following sentences and prove that Y killed the cat using resolution with refutation:

X owns a dog. Every dog owner is an animal lover. No animal owner kills an animal. Either X or Y killed the cat who is named Tom. [7+8]

3. Write a PROLOG program to find post order traversal of a binary tree in a list. [5]