Assignment: 2

Q.2] Differentiate between STRIPS & ADL.

Sr no.	Parameters	STRIPS	ADL
1.	Stand For	Standford Research Institute Problem solver	Action Description language
2.	Literals allowed in states	Only Positive Eg:- Intelligent ∧ Beautiful	Positive as well as Negative E.g. ¬Stupid ∧ ¬Ugly
3.	Assumption for Unmentioned Literals	closed world Assumption Unmentioned literals are false	Open World Assumption:- Unmentioned literals are Unknown
4.	equality	No support	Supported. equality Predicate (x = y) is Built-in
5.	Types	No support	Supported Variables can have types -> P: Person
6.	Effects	Effects are Conjunctions	Conditional Effect allowed (when P:E)

Sr.no	Parameters	STRIPS	ADL
7.	Effect $P \wedge \neg Q$ means:	Add P & Delete Q	Add $P \wedge \neg Q$ Delete $\neg P \wedge Q$
8.	Goals	Goals are Conjuctions	Allows Conjunctions & disjunctions: e.g. $Poor \wedge (Famous \vee Smart)$
9.	Goals	only ground literals	quantified Variables
10)	Scheme includes	Action name Parameter list precondition effect	Action name Parameters list (optional) Groups of clauses labelled: Precond, Add, Delete & Update (optional)
11)	Modelling action in real world application	Not Suteible	Suitable (This inadequancy of STRIPS led to development of ADL).

Q1 Solve the following with forward or backward chaining or solution (any one). Use Predicate logic as the language of knowledge representation. clearly specify the facts & inference rules used.

1.1 Every child sees some witch. No witch has both a black cat & pointed hat.
Example 1.

Ans →

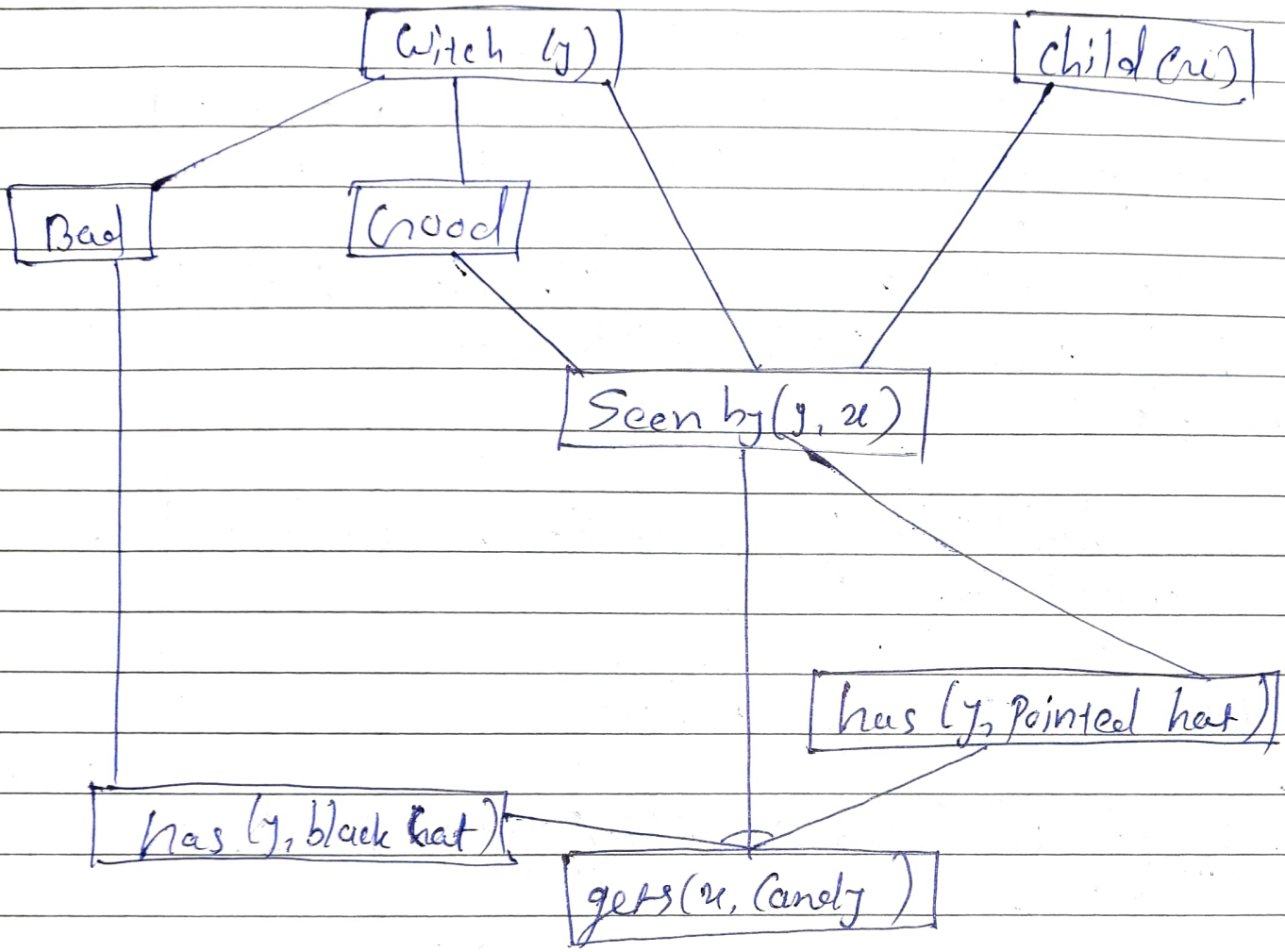
1. $\forall y$ has(witch(y), black cat) $\wedge$ has(witch(y), Pointed hat

2. $\forall y$ witch(y) → good $\vee$ bad

3. $\forall x, y$ sees(Child(x), witch(y) → good) ⇒ gets (Child(x), candy).

4. $\forall y$ has((witch(y) → bad), black cat)

5. $\forall y, x$ seen by(witch(y), child(x)) → has(witch(y), Pointed hat)


Witch (y)
Child (x)
Bad
Good
Seen by (y, x)
has (y, Pointed hat)
has (y, black hat)
gets (x, Candy)

Q1.2. Every witch is good or bad.

Example 2:

1. Every boy or girl a child
2. Every child gets a doll or a train or a lump of coal.
3. No boy gets any doll
4. Every child who is bad any lump of coal.
5. No child gets a train.
6. Ram gets lump of coal.
7. Prove: Ram is bad

Ans →

Inference rules.

1. $\forall x$ child $(x) \rightarrow$ boy $\vee$ child $(x) \rightarrow$ girl
2. $\forall x$ gets (child (x), doll) $\vee$ gets (child (x), train) $\vee$ gets (child (x), coal)
3. $\neg \forall x$ gets ((child $(x) \rightarrow$ boy), doll)

4. $\forall x$ gets ((child(x) $\rightarrow$ bad), coal)

5. $\neg \forall x$ gets (child(x), train)

6. gets (Ram, coal)

7.