

## Knowledge Engineering

\* Explain Semantic Web and RDF.

=> RDF:

RDF stands for Resource Description Framework which is used in the Semantic Web and structuring Data.

It provides a standard way to describe resources and their relationships in a graph-based format.

RDF is used Triple structure for represent data.

RDF statements consist of Three parts

- (a) Subject
- (b) Predicate
- (c) Object

- (a) Subject: The resource being described.
- (b) Predicate: Relationship between subject and object.
- (c) Object: Resource related to subject.
- => Ex. Brainspot is education platform of India.

RDF Representation:

<Brainspot> <Education Platform>  
<India>

Brainspot -> Subject

Education Platform -> Predicates

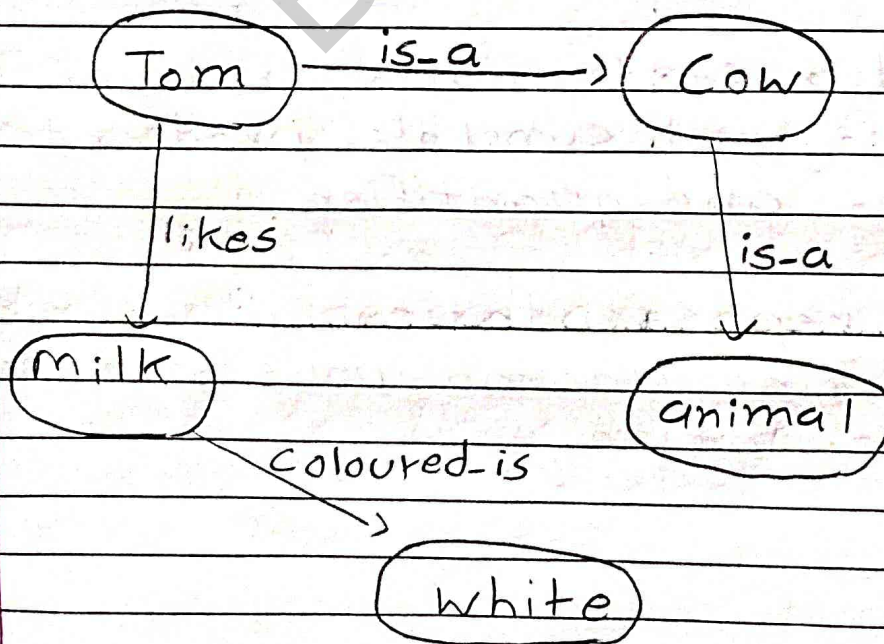
India -> Object

## (b) Semantic Network Representation:

Semantic networks represent knowledge using a network of an interconnected nodes.

In Semantic network, Nodes are represent entities and edges are represent relationships between them.

- ex. Tom is a cow.  
Cow is a animal  
Tom likes milk  
milk coloured is white.



\* Explain Ontology with example.

⇒ An Ontology is a formal and explicit specification of a conceptualization within a specific domain of knowledge.

It provides a structured representation of the entities, concepts, relationships and constraints that exist within that domain.

→ Components of Ontology:

- i) Classes: Used to represent types of entities within the domain.
- ii) Properties: Used to represent relationships between entities.
- iii) Individuals: Refer to specific objects within the domain.
- iv) Axioms: Includes rules that defines the behavior and semantics of the ontology.

-> Purpose of Ontologies:

- 1 Knowledge Representation: Used to serve a formal representation of domain knowledge.
- 2 Semantic Interoperability: Used to facilitate interoperability by providing semantic for communicating and exchanging data between different system.
- 3 Reasoning: Ontologies support automated reasoning for allowing system to derive new knowledge.

-> Applications of Ontologies:

- 1 Used for Knowledge Management Systems,
- 2 Semantic Search Engines
- 3 Expert Systems and Decision Support systems.
- 4 Data Integration

Ex.

### Geographical- Feature

