

GLOSSARY 9

1. **And-elimination:** It is an inference rule which says that from a conjunction, any of the conjuncts can be inferred. If $a \wedge b$ then b can be inferred. [1] Page:250
2. **Assertion:** The sentences which are representation of real world facts are added to KB called as assertions. [1] page:301
3. **Arity:** The number of arguments for a relation or function is defined as arity. [1] page:292
4. **Atomic sentences:** An atomic sentence is the simplest form of a sentence consisting of a single propositional symbol. [1] page:244
5. **Axiom:** It is defined as a sentence which is taken directly without any derivation from other sentences. [1] page:235
6. **Backward Chaining:** It is a process of goal directed reasoning which works backwards from the goal and touches only relevant facts. [2] Slide:37
7. **Bi Conditional:** It is defined as a connective which has the meaning 'if and only if' and is represented by double arrow. [1] page:244
8. **Horn clause:** It is defined as a clause which is a disjunction of literals of which at most one is positive. Horn form is the representation of a horn clause in implication form. The premise in horn form is called body and the conclusion is called head. [1] page:256
9. **Complementary literals:** A literal is said to be complementary to another literal if it is the negation of the other. [1] page:252
10. **Compositionality:** It is defined as a property of a language which means 'the meaning of a sentence is a function of the meaning of its parts'. [1] page:286
11. **Conjunctive Normal Form:** it is defined as a form where a sentence is expressed as a conjunction of clauses. [1] page:253
12. **Data driven:** It is defined as a technique where the reasoning occurs with the focus on known data. [1] page: 258
13. **Deduction theorem:** It is defined as:
$$\alpha \vdash \beta \text{ if and only if the sentence } \alpha \rightarrow \beta \text{ is valid. [1] page:249}$$
14. **Fixed point:** It is defined as a point where no new inferences are possible. [1] page:258
15. **Forward chaining:** It is a process of data driven reasoning which works with the known facts and continue until the goal q is added to the query. [2] slide: 35

16.Goal directed reasoning: It is defined as process which works backwards from the goal and touches only relevant facts. [2] slide:37

17.k-CNF: It is defined as conjunction of exactly k-clauses. [2] slide:30

18.Literal: It is defined as either an atomic sentence or a negated atomic sentence. [1] page:244

19.Logical connectives: These are used to construct complex sentences from simple sentences and has a certain logical meaning. [1] page:244

20.Logical equivalence: Two sentences are said to be logically equivalent if they are true in the same set of models. [1] page:249

21.Modus Ponens: It is defined as an inference rule, $a \rightarrow b$, a then b can be inferred. [1] page:250

22.Monotonicity: It is defined as a property of logical systems which states that the set of entailed sentences can only increase if new information is added to the knowledge base. [1] page:251

23.Predicate symbol: It is defined as a symbol which is present in first order logic and stands for objects. [1] page:292

24.Premise: In an implication statement, the proposition which is present to the left side of implication symbol is called premise. [3]

25.Propositional logic: It is defined as a type of logic where each fact in a world is represented as a proposition and the syntax defines the allowable sentences. [1] page:243

26.Propositional symbol: It is defined as a symbol which represents a proposition and can be either true or false. [1] page:244

27.Reduction ad absurdum: It is defined as a form of argument which attempts either to disprove a statement by showing it inevitably leads to an impractical conclusion or to prove that if it were true the result would be impossible. It proves by checking the unsatisfiability of a statement. [4]

28.Refutation completeness: It is defined as 'if a set of sentences are unsatisfiable, then the resolution will always result in a contradiction.' [1] page:350

29.Resolution: It is defined as resolving a set of statements in to a smaller set. The resolution can yield a complete inference algorithm if applied on CNF. [1] page:252

30.Resolution closure: It is defined as a set of all clauses which are derivable by repeated application of the resolution rule to clauses and their derivatives. [1] page:256

31.Satisfiability: A sentence is said to be satisfiable if it is true in at least one model. [1] page:250

32.Tautology: It is defined as a sentence which is true in every model. [1] page:249

33.Term: It is defined as a logical expression which refers to an object. [1] page:294

34.Theorem: It is defined as the statements which are entailed by the axioms. In propositional logic, it is proved by a chain of reasoning. [1] page:302

35.Truth table: It is defined as a table which enumerates all the possible truth value assignments for a complex sentence. [1] page:245

36.Unit clause: It is defined as a clause which consists of a single literal. [1] page:253

37.Validity: A sentence is said to be valid if it is true in all models. It is also called as tautology. [1] page:249

Reference:

[1] Artificial Intelligence, A Modern Approach (AIMA), Third Edition, by Russell & Norvig.

[2] Handout #10, #11 by professor Berthe Choueiry.

[3] Class Notes

[4] https://en.wikipedia.org/wiki/Reductio_ad_absurdum