Chapter 4 – Review questions

Select the best answer from the given alternatives for each of the following multiple-choice questions:

Note: study well before you attempt to answer

1. Which of the following is a key objective of knowledge representation and reasoning?
    a) Acquiring knowledge about the world
    b) Processing images and videos
    c) Designing user interfaces
    d) Developing machine learning algorithms
2. Logic and inference are fundamental to:
    a) Natural language processing
    b) Speech recognition
    c) Reasoning and decision-making
    d) Data visualization
3. Propositional logic deals with statements that are:
    a) True or false
    b) Complex and ambiguous
    c) Subjective and opinion-based
    d) None of the above
4. What type of logic allows for more expressive representation of natural language statements?
    a) Propositional logic
    b) First-order logic
    c) Inductive logic
    d) Fuzzy logic
5. Quantifiers in first-order logic are used to:
    a) Represent objects, relations, and functions
    b) Determine the truth value of a proposition
    c) Apply logical connectives to statements
    d) Specify the quantity of objects in the universe of discourse

6. Which of the following is an advantage of logical representation in knowledge representation?

    a) Allows for natural language processing

    b) Provides a transparent representation of knowledge

    c) Supports graphical networks

    d) Facilitates easy programming

7. Which knowledge representation technique is based on graphical networks consisting of nodes and arcs?

    a) Logical representation

    b) Semantic network representation

    c) Frame representation

    d) Production rules

8. What is an advantage of frame representation in knowledge representation?

    a) Supports efficient inference mechanism

    b) Provides a natural representation of knowledge

    c) Allows for easy addition of new attributes and relations

    d) Facilitates rule-based production systems

9. In production rules, what determines which rule may be applied to a problem?

    a) Working Memory

    b) The set of production rules

    c) The recognize-act cycle

    d) The condition part of the rule

10. What are the requirements of a good knowledge representation system?

    a) Representational Accuracy, Inferential Efficiency, Acquisitional Efficiency

    b) Logical Reasoning, Natural Language Processing, Inference Mechanism

    c) Semantic Networks, Frame Representation, Production Rules

    d) Deductive Reasoning, Inductive Reasoning, Abductive Reasoning

11. Which approach to knowledge representation uses the relational method and lacks inference capabilities?

    a) Simple Relational Knowledge

    b) Inheritable Knowledge

    c) Inferential Knowledge

    d) Semantic Network Representation

12. Which reasoning process starts with specific facts and reaches a general conclusion?

    a) Deductive Reasoning

    b) Inductive Reasoning

    c) Abductive Reasoning

    d) Common Sense Reasoning

13. What is a drawback of semantic network representation?

    a) Supports efficient inference mechanism

    b) Provides a natural representation of knowledge

    c) Takes more computational time at runtime

    d) Exhibits learning capabilities

14. What type of reasoning guarantees the correctness of the conclusion based on the truth of the premises?

    a) Deductive Reasoning

    b) Inductive Reasoning

    c) Abductive Reasoning

    d) Monotonic Reasoning

15. Which knowledge representation technique uses graphical networks and categorizes objects based on IS-A and Kind-of relations?

    a) Logical representation

    b) Semantic network representation

    c) Frame representation

    d) Production rules