Tutorial Unit 1
M Sc IT II Semester
PS02CINT33: Artificial Intelligence
Prof. Priti Srinivas Sajja

Short Questions/Objective Questions

1. Define AI.
2. List any three characteristics of natural intelligence.
3. List any three constituents of AI definition.
4. State and explain in brief the nature of AI solution.
5. Name three types of AI application areas. Which of these area is the most difficult to implement?
6. Give two real life systems/applications that use AI. Mention how AI can be used in the system in one line.
7. What is full form of DIKW?
8. Define a production system.
9. Define KBS (Full form and one line definition).
10. List any two types of KBS.
11. Draw general structure of KBS.
12. List sources of knowledge.
13. List types of knowledge.
14. List components of knowledge.
15. Give an example of fact.
16. Give an example of rule or procedural knowledge.
17. Give an example of heuristic.
18. Name two strategies of inference engine working.
19. What are the limitations of knowledge acquisition in a typical KBS?
20. List three strategies of knowledge update.
21. Give full form of WFF. Where can it be used?
22. Define predicate in knowledge representation.

Big Questions

23. Define and describe NI and AI. Also state and explain in brief the nature of AI solution.
24. List and describe three types of AI application areas. Also give examples from each category. Which of these area is the most difficult to implement?
25. Write a short note on data pyramid (DIKW chain) and systems in the data pyramid (DIKW chain).
26. Explain production system by taking a water jug problem.
27. Explain hill climbing search.
28. Draw general structure of KBS. Explain all its components in brief.
29. Explain various types of knowledge such as (i) commonsense knowledge, (ii) informed common sense knowledge, (iii) meta knowledge, (iv) domain knowledge, etc.
30. Explain knowledge components (such as facts, rules, and heuristic) by giving example of each.
31. Explain how inference engine works. OR
    Explain forward chaining and backward chaining mechanisms of typical inference engine.
32. Explain knowledge acquisition process.
33. Explain knowledge representation structures.
34. Draw model of KBS development.
35. Describe limitations of symbolic representations of knowledge into a typical KBS.

Tutorial Unit 3: ANN

M C A III / V Semester

PS03CMCA33/ PS05CMCA53: Artificial Intelligence

Prof. Priti Srinivas Sajja

Short Questions/Objective Questions

1 An Artificial Neural Network documents its knowledge in _____.

(a) Cell body (c) Processing function

(b) Nuclease (d) Connections

2 _____ is not an artificial neural network model.

(a) Perceptron model (c) Kohonen model

(b) Hopfield model (d) Smart model

3 Hopfield model of neural network learns by _____.

(a) Back propagation (c) Parallel relaxation

(b) Clustering (d) Vertical relaxation

4 ANN uses _____ representation of knowledge.

(a) Connectionist (c) Temporary

(b) Symbolic (d) Rule based

5 A function in the nucleus of an artificial neuron is called _____ function.

(a) Processing function (c) Transfer function

(b) Activation function (d) All of these

6 _____ is an example of a popular activation function of neural network.

(a) Sigmoid (c) Subtraction

(b) Addition (d) Multiplication

7 Artificial neural network are intelligent systems that can be used for _____.

(a) Explanation (c) Reasoning

(b) Pattern matching (d) User interface

8 _____ is a computer program that simulates the working of natural nervous system.

(a) Control system (c) Memory management

(b) Artificial neural network (d) Device drivers

9. Learning with the help of labeled training data is known as _____ learning.

(a) Supervised (c) Re-inforcement

(b)Unsupervised (d) Controlled

10 Learning in ANN is _____.
(a) Bio-inspired (c) Temporal
(b) Random (d) Not needed

11 The objective of _____ models and techniques to take inspiration from Mother Nature and solve problems in more effective and intelligent way. (bio-inspired)

12 _____ takes inspiration from the collective behavior of social insect colonies and other animal societies such as ants, fish, birds and honey bees. Swarm intelligence

13 State True or False: An artificial neural network (ANN) is a simulation of biological neural network in a narrow domain. True

14 State True or False: Hopfield model of ANN works on parallel relaxation. True

15 State True or False: Machine Learning (ML) is defined as an ability to learn without being explicitly programmed. True

16 Supervised learning uses a pre-defined set of training examples with proper labels.

17 Unsupervised is a learning paradigm for ANN with unlabeled training data.

18 Typical ANN for shallow learning requires _____ hidden layers. one or two (max three)

19 Deep learning approach supports automatic feature extraction form the data/images unlike shallow learning.

20 State True or False: Machine learning is a subset of AI. True

21. What is artificial neuron?
22. Draw an artificial neuron.
23. Draw a biological neuron.
24. List characteristic of an artificial neural network.
25. What is an activation/transfer/ processing function?
26. Give an example of activation function. (weighted sum, weighted avg, sigmod, etc.)
27. Name model/architectures of artificial neural network.
28. What is parallel relaxation?
29. Give structure of multiplayer perceptron.
30. List only two main phases of learning in a typical multiplayer perceptron.
31. What is forward pass?
32. What is backward pass?
33. Name learning algorithm of multiplayer perceptron.

34. State true or false: Creditability of a multiplayer perceptron depends on its training data set. True
35. State true or false: Learning from labeled training data sets in presence of a control mechanism is called supervised learning. True
36. State true or false: ANN is used for classification. True
37. What is the advantage of an ANN? Learning from the data without specifically programming
38. Give a limitation of ANN. (Explanation and reasoning)
39. Write an application of single perceptron. (Join or any or not)
40. Write an application of multiplayer perceptron. (Sales prediction, pattern matching, product selection, diagnosing, etc.)
41. Explain supervised learning.
42. Explain un-supervised learning.

Big Questions/ Assignment Questions

43. Draw biological neuron and artificial neuron with proper labels. Also explain working of an artificial neuron.
44. Give an example of single perceptron of your choice by giving its diagram.
45. Explain Hopfield model in detail by giving its diagram and learning algorithm.
46. Design a multi layer perceptron for sales prediction. Also give its sample training data set.
47. Design a multi layer perceptron for selection of a job. Also give its sample training data set.
48. Design a multi layer perceptron for selection of a course. Also give its sample training data set.
49. Explain design heuristic in a multi layer neural network.
50. Explain learning in a multi layer neural network.