TY BSc IT Sem-V
Nov-22

28/11/22

Paper / Subject Code: 53704 / Artificial Intelligence

(2½ Hours)

[Total Marks: 75]

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: 15

a. Explain Artificial Intelligence with Turing Test approach.
b. Describe the contribution of Philosophy and Mathematics to Artificial Intelligence.
c. State the relationship between agents and environment.
d. What is PEAS description? Explain with two suitable examples.
e. Explain following task environments:
i) Single Agent vs. Multiagent
ii) Episodic vs. Sequential
f. Describe the structure of Utility based Agent.

2. Attempt *any three* of the following: 15

a. Describe the problem formulation of Vacuum World problem.
b. Explain following terms:
i) State Space of problem ii) Path in State Space
iii) Goal Test iv) Path Cost
v) Optimal Solution to problem
c. Give the outline of Breadth First Search algorithm with respect to Artificial Intelligence.
d. With the Local Search algorithm, explain the following concepts:
i) Shoulder ii) Global Maximum iii) Local Maximum
e. Illustrate Hill Climbing algorithm using 8 queen problem.
f. Explain the mechanism of Genetic Algorithm.

3. Attempt *any three* of the following: 15

a. Explain Minimax algorithm in detail.
b. Describe the technique of Alpha-Beta Pruning.
c. Write a short note on Kriegspiel's Partially observable chess.
d. What is knowledge based agent? Explain its importance in problem solving techniques.
e. Write a short note on Wumpus world problem.
f. Explain Forward-Chaining algorithm for Propositional definite Clauses.

4. Attempt *any three* of the following: 15

a. What is meant by First Order Logic? Explain syntax and semantics of First Order Logic.
b. Write a short note on Universal and Existential quantifier with suitable example.
c. Explain the steps of Knowledge Engineering projects in First Order Logic.
d. Write a short note on Unification Process.
e. Explain Datalog used in first order definite clause.
f. Describe Backward-Chaining algorithm for First Order definite Clauses.

[*Turn over...*

5. **Attempt *any three* of the following:** 15

a. Explain Planning Domain Definition Language description for an Air Cargo planning problem.

b. Describe Forward (Progression) State-Space Search algorithm with an example.

c. Explain hierarchical planning.

d. Write a short note on Sensorless Planning Problem.

e. What are events? Explain its importance.

f. What is semantic network? Show the semantic network representation with a suitable example.
