6th Semester B.Tech End Term Examination 2021-2022
ARTIFICIAL INTELLIGENCE(18CS2T29)

Duration: 03:00   Full Marks: 60

1 *Answer All*

a What is Turing test?   1

b What is Iterative Deepening search?   1

c What is Constraint satisfaction problem (CSP)?   1

d Explain what is "Evaluation Function" of a node in case of informed search.   1

e Differentiate between propositional Logic and first order logic.   1

f What is the use of Propositional Logic in the domain of AI ?   1

g Is Partial Order Planning better than total order planning?   1

h Differentiate between search and vs. planning.   1

i What are the Four elements of a learning agent?   1

j What is supervised Learning?   1

2 *Answer All*

a Explain a rational agent with a diagram.   3

b Describe how an informed search problem can be defined in AI in terms of the sets [S, s, O, G, h].   3

c Rewrite the following sentenences in first order logic: 3

   i) All dogs are mammals.

   ii) Everyone is loyal to someone.

   iii) No person likes a leader unless he is honest.

d What are Conditional probabilities, Bayes rule and theorem?   3

e What are the differences between Supervised Learning, UnSupervised Learning and reinforecement learning.   3

3 *Answer any One*

a State and explain the BFS for a branching factor of b and depth d. Compare it with DFS with an example of your choice.   7

b Consider the following agent types, Discuss their PEAS descriptions and mention their task environments and characteristics.(Any Three)   7

   a)Medical diagnosis system

   b) Satellite image analysis system

   c) Part-picking robot

   d) Interactive English tutor

   e) Refinery controller

4 *Answer any One*

a Explain the game Tic-Tac-Toe as a state space. Explain the State, Operators, Start state, Terminal states and the search tree. 7

b Explain Constraint Satisfaction Problems with the help of Map-Coloring example with Backtracking search, most and least constrained variable techniques. 7

5 *Answer any One*

a 1. Ram likes to eat peanuts. 7

2. Ram eats whatever Hari eats.

3. Hari eats eatables.

4. Anyone who eats eatables is a human being.

Prove Hari is a human being using resolution.

b Using resolution: Steve likes easy courses. Science is a hard course. All courses in basket weaving department are easy. BK301 is a basket weaving course. Prove that Steave takes BK301. 7

6 *Answer any One*

a Discuss about a partial-order plan for putting on shoes and socks, and the six corresponding linearization into total-order plans. 7

b Describe Transportation (Air Cargo) planning problem in detail along with the initial state, goal state, actions & steps to reach goal state. 7

Example: Air Cargo Transport

- Loading/unloading cargo onto/off planes and flying it from place to place.
- Actions: Load, Unload, and Fly
- States:
  - In(*c*, *p*): cargo *c* is inside plane *p*
  - At(*x*, *a*): object *x* (plane/cargo) at airport *a*

7 *Answer any One*

a Explain with diagram the perceptron model with AND gate and OR gate as an example. 7

b Using information gain and the following training data find out which attribute should be delected as the root node? 7

PlayTennis: training examples

Day	Outlook	Temperature	Humidity	Wind	PlayTennis
D1	Sunny	Hot	High	Weak	No
D2	Sunny	Hot	High	Strong	No
D3	Overcast	Hot	High	Weak	Yes
D4	Rain	Mild	High	Weak	Yes
D5	Rain	Cool	Normal	Weak	Yes
D6	Rain	Cool	Normal	Strong	No
D7	Overcast	Cool	Normal	Strong	Yes
D8	Sunny	Mild	High	Weak	No
D9	Sunny	Cool	Normal	Weak	Yes
D10	Rain	Mild	Normal	Weak	Yes
D11	Sunny	Mild	Normal	Strong	Yes
D12	Overcast	Mild	High	Strong	Yes
D13	Overcast	Hot	Normal	Weak	Yes
D14	Rain	Mild	High	Strong	No