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PRANVEER SINGH INSTITUTE OF TECHNOLOGY KANPUR

Odd Semester Session 2023-24 CT -I

B. Tech. Vth Semester

Artificial Intelligence (KAI-501)

CO Number	Course Outcome
CO1	Understand **[L1. Knowledge]** artificial intelligence and various characteristics of intelligent agents.
CO2	Discuss **[L2. Comprehension]** the various search strategies and algorithms in artificial intelligence.
CO3	Apply **[L3. Application]** knowledge representation techniques and problem solving strategies to AI applications.
CO4	Analyze **[L4.Analysis]** software agents and its applications in NLP.

Time: 1.5 Hrs. M. M. 15

Section A

Q1. Attempt all questions: **(1X3 = 3 Marks)**

a) State the steps in solving a problem using artificial intelligence. CO1

b) List various types of environment from agent point of view. CO1

c) Differentiate between Artificial Intelligence and Machine Learning. CO2

Section B

Q2. Attempt all questions: **(2X4 = 8 Marks)**

a i) Define artificial intelligence and list the properties of intelligent agents. CO1

Or

ii) Define n-queens problem along with the various components of the problem and state space. CO1

b i) Describe Depth first search technique with suitable example in detail. CO2

Or

ii) Explain Goal based agent using a labeled diagram. CO2

c i) Explain Breadth first search technique with suitable example in detail. CO2

Or

ii) Differentiate between: CO2

- Sequential and episodic environment
- Discrete and continuous environment

d i) Explain 8-puzzle problem along with the various components of the problem and its state space. CO2

Or

ii) Describe bidirectional search along with its advantages and disadvantages. CO2

Section C

(4X1 = 4 Marks)

Q3

i) Explain the six disciplines needed for an intelligent agent to pass the Turing test. CO2

Or

ii) Two jugs are provided with capacity of 3 and 4 liters with no marking in them. Given a water supply with a large storage. Describe the steps to separate 2 liters of water into the 4 liters jug using these two jugs with all the production rules and state space, representing thetransition of states. CO2

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PRANVEER SINGH INSTITUTE OF TECHNOLOGY KANPUR

Odd Semester **Session 2023-24** **Pre-University**

B. Tech. 5th Semester

Artificial Intelligence (KAI-501)

CO Number	Course Outcome
CO1	Understand **[L1. Knowledge]** artificial intelligence and various characteristics of intelligent agents.
CO2	Discuss **[L2. Comprehension]** the various search strategies and algorithms in artificial intelligence.
CO3	Apply **[L3. Application]** knowledge representation techniques and problem solving strategies to AI applications.
CO4	Analyze **[L4.Analysis]** software agents and its applications in NLP.

Time: 3 Hrs. M. M. 100

Section A

Q1. Attempt all questions: **(2X10 =20 Marks)**

a) Define the role of artificial intelligence in future. CO1

b) Define Turing test and capabilities required by machine to pass this test. CO1

c) Examine N- Queen problem with four components of the problem. CO4

d) Explain ontology engineering in brief. CO2

e) Explain universal and existential quantifiers. CO2

f) Explain the elements and symbols of FOPL. CO2

g) Illustrate agent communication. CO3

h) Illustrate bargaining with example. CO3

i) Define robotic perception. CO1

j) Define backtracking search. CO1

Section B

Q2. Attempt all questions: **(10X3 = 30 Marks)**

a) Define environment and explain various types of environment with example. CO1

b) Illustrate reasoning systems for categories in detail with example. CO3

OR

c) Demonstrate constraint satisfaction problem and solve the given problem. CO3

```
   CROSS
+  ROADS
  -------
  DANGER
```

d) Differentiate between breadth first search and depth first search with example. CO2

OR

e) Explain forward and backward chaining and its mechanism with example. CO2

Section C

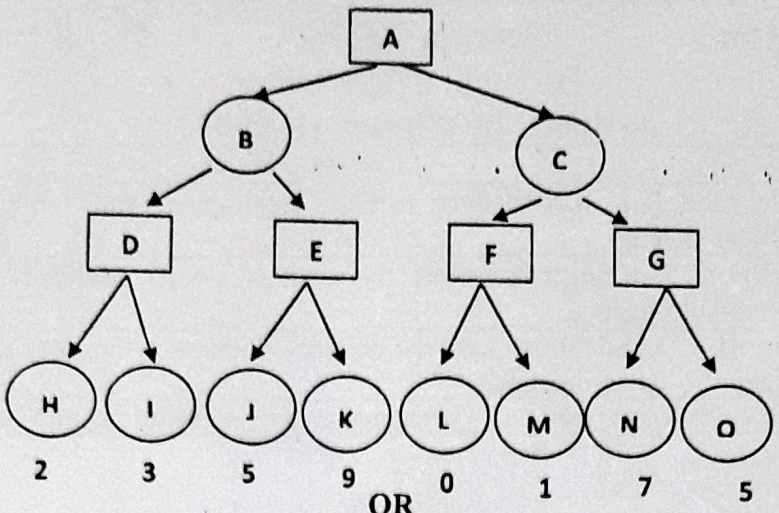
Q3. Attempt all questions: **(10X5 = 50 Marks)**

a i) Explain an agent program and identify the five basic types of agent program in AI system. CO2

OR

ii) Identify the informed search strategies. Explain any one in detail with example. CO2

b i) Explain the need of pruning in a game tree. Explain α-β cut-off. Show the branches in given figure that should be pruned out. (Indicate α-β Given: Max moves first). CO2



OR

ii) Explain hill climbing algorithm and the problems associated with hill climbing in detail. Identify some methods to overcome these problems. CO2

c i) Determine the following facts as predicates and convert them to clause form. Also prove by resolution that: John likes peanuts. CO3

a. John likes all kind of food.

b. Apple and vegetable are food.

c. Anything anyone eats and not killed is food.

d. Anil eats peanuts and still alive.

e. Harry eats everything that Anil eats.

OR

ii) Determine the various types of architectures for software agents. CO3

d i) Examine negotiation and bargaining in context to software agents. CO4

OR

ii) Examine trust and reputation in multi-agent systems in detail. CO4

e i) Explain in detail : CO2

(i) Natural Language Processing.

(ii)Machine Translation.

OR

ii) Explain speech recognition application and its functionalities. CO2