## **Department of Computer Engineering**

T.E. (Computer Sem VI) Assignment	·1 Artificial Intelligence (CSC604)
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CO Addressed:—CSC604.1 -To conceptualize the basic ideas and techniques underlying the design of intelligent systems.

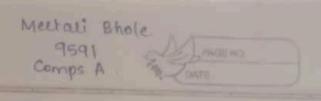
## **Assignment 1:**

- 1. Explain the concept of rationality in the context of intelligent agents. How does rationality relate to the behavior of agents in their environments? Provide examples to illustrate your explanation.
- 2. Discuss the nature of environments in which intelligent agents operate. What are the key characteristics that define an environment, and how do they influence the design and behavior of agents? Provide examples of different types of environments and the challenges they present to agents.
- 3. Describe the structure of intelligent agents and the types of agents commonly used in artificial intelligence. What are the components of an agent, and how do they interact to achieve intelligent behavior? Provide examples of different types of agents and their applications in real-world scenarios.
- 4. Outline the process of problem-solving by searching, including the role of problem-solving agents and the formulation of problems. How do problem-solving agents analyze and approach problems, and what methods do they use to search for solutions? Illustrate your explanation with examples of problem-solving tasks and the strategies employed by agents to solve them.

## **Rubrics for the First Assignments:**

Indicator	Average	Good	Excellent	Marks
Organization (2)	Readable with some missing points and structured (1)	Readable with improved points coverage and structured (1)	Very well written and fully structured	
Level of content(4)	All major topics are covered, the information is accurate (2)	Most major and some minor criteria are included. Information is accurate (3)	All major and minor criteria are covered and are accurate (4)	
Depth and breadth of discussion and representation(4)	Minor points/information maybe missing and representation isminimal (1)	Discussion focused on some points and covers themadequately (2)	Information is presented indepth and is accurate (4)	
Total				

Signature of the Teacher



## Artificial Intelligence Assignment -1

explain the concept of rationality in the context of intelligent agents: How does rationality relate to the behavior of agents in their environments? Provide examples to illustrate your explanation.

ns -> Rationality in the context of intelligent agents refers to the ability of an agent to make decisions that maximize the expected outcome or utility based on available information and goals.

fts objectives, considering the current state be of the environment and its knowledge.

Examples: -

- · Chess playing AI A chess playing AI agents set that

  Selects moves to maximize the

  probability of wining based on 1k

  waluation of the current board

  position.
- · Autonomous Vehicles An autonomous car makes decision

  to navigate through traffic to reach

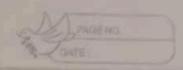
  its destination efficiently and

  safely.

Discuss the nature of environments in which intelligent agents operate. What are the key characterstice that define an environment, and how do they influence the design and behavior of agents? Provide examples of different types of environments and the challenges they present to agents.



Ans: - > Environments for intelligent agents encompass everythis that the agent interacts with including physical and virtual elements. - An environment is fully observable if the agents ensors are sensors can detect all relevant aspects. Otherwise, it is partially observable. > In a deterministic environment, the next state is completely determined by the current state and the agents are actions. In sto chastic environments, there is uncertainity In epos episodic environments, each decision a independent - sequential environments involve a series of actions with dependencies Examples :-· these game - Fully observable, deterministic and sequential · Automomous drone delivery - partially observable, sto chastic ( due to weather), and sequential. 3 Describe the structure of intelligent agents and the types of agents commonly used in artificial intelligence what are the components of an agent, and how do they interact to achieve intelligent behavior? Provide examples of different types of agents and their applications in real-world scenarios. Ans -> components:-· perception - The agent's ability to percieve its environment through sensors



- · Actuators The mechanisms through which the agent
- · Reasoning The ability to make decisions based on available information.
- · Learning Adaption and improvement based on experience

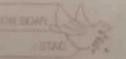
- Types of Agents:-

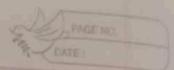
- · Simple Reflex Agents Act solely based on the current percept.
- · Model Based Reflex Agents maintain an internal = state based on past percept.
- · Coal-Based Agents- work towards achieving specific goals.
- · urility pased Agents consider utility or values when making decisions

- Examples :-

- · Roomba vacuum cleaner: Simple reflex agent
- · Personal assistance (eg Siri or Alexa): Mob Modelbased reflex agent.

4 Outline the process of probleming - solving by searching, including the role of problem - solving agents and the formulation of problems. How do problem - solving agents analyze and approach problems, and what methods do they use to search for colutione? Illustrate your explanation with examples of problem - solving tasks and the strategies employed by agents to





of actions to find solutions to problems.
formulation of Problems: Define the inhal state, act transition model, goal test, and path cost.
explore possible solutions.
* Examples:
· Poute planning - finding the shortest path between two locations on a map using algorithms like A.  · Puzzle solving - solving a Rubik's cube by explaning
· came playing - these AI exploring possible moves
and outcomes to determine the best moves.
and district the second
The same of the sa