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Internal Assessment Test 1 – December 2023

Sub:	Principles of Artificial Intelligence					Sub Code:	21AI54	Branch:	AIML	
Date:	19/12/23	Duration:	90 minutes	Max Marks:	50	Sem/Sec:	VA		OBE	

		Answer any FIVE FULL Questions	MARKS	CO	RBT
1		*Compare and contrast the definitions of Artificial Intelligence from the following point of view: Thinking Humanly, Acting Humanly, Thinking Rationally and Acting Rationally?* *Thinking Humanly* | *Thinking Rationally* *Acting Humanly* | *Acting Rationally* *First row is about thinking and reasoning, while the second row is about behavior.* *Acting Humanly - Turing test approach. Attempt to define AI as to make computers act like humans. Turing test - a computer passes that test if a human interrogator, after posing some written questions, cannot tell whether written responses come from a person or from a computer. The computer needs to possess NLP, knowledge representation to state the knowledge, automated reasoning, machine learning, computer vision and robotics.* *Thinking Humanly - Cognitive modeling approach attempts to define AI as to make computers think like humans. Three ways to understand the working of humans minds:* *Introspection, observation, brain imaging* *Thinking Rationally: Precise notation for statements to represent the world. Logical programs were developed which can solve any solvable problem. If no solution exists, the program loops forever. However the method suffers from the drawback that it is difficult to express knowledge as formal terms. It would also incur high computational resources.* *Acting Rationally: A rational agent is the one that acts to achieve the best outcome. making correct outcomes is a part of being a rational agent. (4 x 2 + 2 = 10)*	[10]	CO1	L3
2	a	What is the Turing test? *The Turing test was proposed by Alan Turing in 1950. A computer passes the test if a human interrogator, after posing on some written questions, cannot tell whether the written responses came from a person or computer.*	[5]	CO1	L2
	b	What are the capabilities a computer must possess to meet the Turing test? *NLP, Knowledge representations, Automated versioning, Machine Learning, Computer Vision, Robotics. (5 x 1 = 5)*	[5]	CO1	L2
3		Define the following terms with respect to an intelligent agent: (i) Agent, (ii) Environment (iii)Sensors, (iv) Actuators (v) percepts, percept sequence (vi) agent functions, agent programs	[6]	CO1	L1

		An agent is anything that can be viewed as perceiving its environment through sensors and acting upon the environment through actuators. A human agent has sense organs and hands, legs and vocal treat for actuators. *A robotic agent has cameras for sensors and motors for actuators. A software agent receives key strokes, file content and network packets as sensory inputs and acts on the environment by displaying on the screen, writing files and sending network packets.* *(v) Percept, percept sequence: the term percept refers to the agent's perceptual inputs at any given instant. An agent's percept sequence is the complete history of everything the agent has ever perceived.* *(ii)Environment: The world in which an AI system functions is referred to as the environment. It includes its physical environment, digital platform and virtualized worlds.* *(vi)Agent functions, agent programs: an agent functions maps any percept sequence to an action. The agent function is implemented as an agent program. (6 x 1 = 6)*			
3	b	*Define a rational agent.* *For each possible percept sequence, a natural agent should select an action that is expected to maximize its performance measure, given the evidence provided by the percept sequence and whatever built-in knowledge the agent has.*	[4]	CO1	L1
4		*Properties of task environment.* *Fully Observable vs. Partially Observable* *Deterministic vs. Stochastic* *Single-agent vs. Multi-agent* *Static vs. Dynamic* *Discrete vs. Continuous* *Episodic vs. Sequential* *Known vs. Unknown (1+2+2+1+1+2+1 = 10)*	[10]	CO1	L2
5		Compare and contrast four types of agent programs? *1. Simple Reflex agent* *2. Model-based reflex agent* *3. Goal-based agents ·* *4. Utility-based agents (2+2+3+3 = 10)*	[10]	CO1	L2
6	a	Define five components of a well-defined problem? *Initial state,* *actions,* *transition model,* *goal state,* *Path cost. (5 x 1 = 5)*	[5]	CO2	L1
	b	Write the pseudocode for a simple problem solving agent? *function SIMPLE-PROBLEM-SOLVING-AGENT(percept) returns an action* *persistent: seq, an action sequence, initially empty* *. state, some description of the current world state* *goal, a goal, initially null* *problem, a problem formulation* *state ← UPDATE-STATE(state, percept)* *if seq is empty then* *goal ← FORMULATE-GOAL(state)* *problem ← FORMULATE-PROBLEM(state, goal)* *seq ← SEARCH(problem)* *if seq = failure then return a null action* *action ← FIRST(seq)*	[5]	CO2	L3

		seq ← REST(seq) *return action*			