CT1 S1 Anskey AI M - There are important questions in it

Artificial Intelligence (SRM Institute of Science and Technology)

	SRM INSTITUTE OF SCIENCE AND TECHNOLOGY	Register No:
	Vadapalani, Chennai – 600 026	

CONTINOUS LEARNING (THEORY) ASSESSMENT– I
EVEN SEMESTER, 2020- 2021
B.Tech COMPUTER SCIENCE AND ENGINEERING
18CSC305J– ARTIFICIAL INTELLIGENCE

Time: 45Mins　　　　　　　　SEMESTER-VI　　　　　　MAXIMUM MARKS: 25
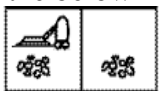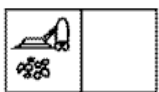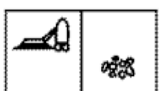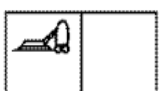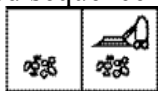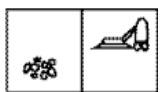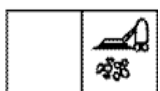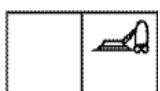
COURSE LEARNING RATIONALE:
CLR-1 : Provide a broad understanding of the basic techniques for building intelligent computer systems and an understanding of how AI is applied to problems.
CLR-2 : Gain knowledge in problem formulation and building intelligent agents
COURSE LEARNING OUTCOME:
CLO-1 : Formulate a problem and build intelligent agents
CLO-2: Apply appropriate searching techniques to solve a real world problem

Answer the MCQ's PART – A (15 x 1 = 15 Marks)	CLO.	K.NO.
1. Artificial Intelligence is about_____ 　a) Playing a game on Computer 　**b) Making a machine intelligent** 　c) Programming on Machine with your Own Intelligence 　d) Putting your intelligence in Machine	CLO1	K1
2. If the following states in the diagram represents states of a vacuum cleaner , which of the below mentioned sequence helps it to reach the goal state {7 or 8} ? Sequences :　(1) 2,4,3,7 (2) 1,5,6,8 (3) 4,2,3,8 (4) 1,5,2,8 　A) 1,2,4 are valid 　**B) 1,2 valid** 　C) 2 and 4 only valid 　D) 2,3,4 are valid	CLO2	K2

3.	What is state space?
	  a. The whole problem
	  b. Your Definition to a problem
	  c. Problem you design
	  d. Representing your problem with variable and parameter
		CLO1	K1

4.	An AI agent perceives from the environment using___.
	  a. Sensors
	  a. Perceiver
	  b. Actuators
	  c. Both a and c
		CLO1	K1

5.	The "imitation game" was originally called by its creator as a. LISP b. Cybernetics **c. Turing Test** d. Logic Theorist	CLO2	K1
6.	Given below are the Production Rules for Water Jug Problem. 1. $(x,y) \rightarrow (4,y)$ Fill the 4-gallon jug 2. $(x,y) \rightarrow (x,3)$ Fill the 3-gallon jug 3. $(x,y) \rightarrow (x-d, y)$ Pour water out from the 4-gallon jug 4. $(x,y) \rightarrow (x,y-d)$ Pour water from the 3-gallon jug 5. $(x,y) \rightarrow (0,y)$ Empty the 4-gallon jug 6. $(x,y) \rightarrow (x,0)$ Empty the 3-gallon jug 7. $(x,y) \rightarrow (4,y-(4-x))$ Pour water from the 3-gallon jug into the 4-gallon jug until the 4-gallon jug is full 8. $(x,y) \rightarrow (x-(3-y), 3)$ Pour water from the 4-gallon jug into the 3-gallon jug until the 3-gallon jug is full. 9. $(x,y) \rightarrow (x+y, 0)$ Pour all water from the 3-gallon jug to the 4-gallon jug 10. $(x,y) \rightarrow (0, x+y)$ Pour all water from the 4-gallon jug to the 3-gallon jug 11. $(0,2) \rightarrow (2,0)$ Pour 2 Gallon of water from the 3-gallon jug to the 4-gallon jug 12. $(2, y) \rightarrow (0,y)$ Pour 2 Gallon of water from the 4-gallon jug to ground. Given the initial state is $(0,0)$ and goal state is $(2,0)$. Identify the correct sequence to solve the problem . a. (0,0),R9,R7,R2,R3,R6,R8 b. (0,0),R1,R2,R5,R7,R11,R12 c. (0,0),R1,R8,R6,R10,R1,R7,R8 **d. (0,0),R2,R9,R2,R7,R5,R9**	CLO2	K2
7.		CLO2	K2

Consider the 8-Puzzle problem given below.
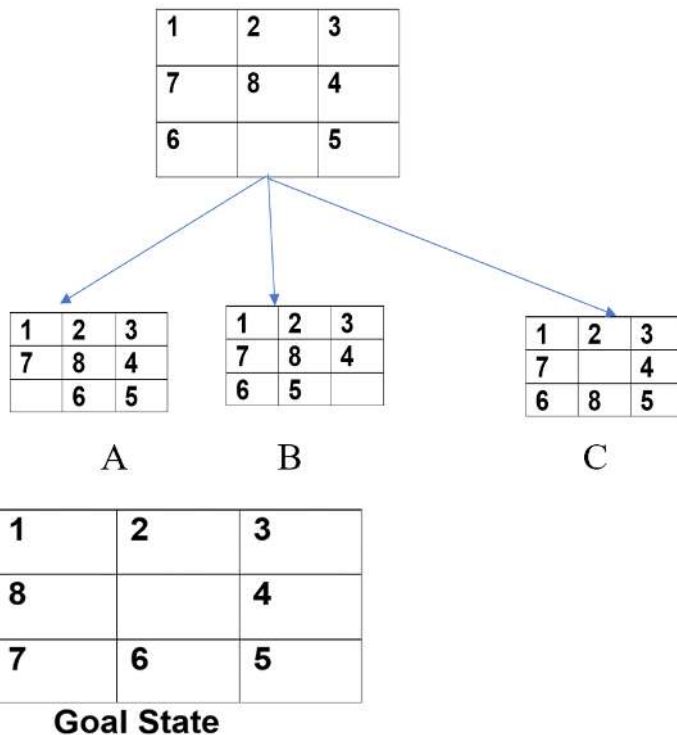
To reach the Goal state, the "h value" for the states A,B and C are:

a) 4,5,6
b) 6,4,5
c) 5,4,6
d) 5,5,4

| 8.	A fully observable problem belongs to the category of A. Multi-state problem B. Two-state problem **C. Single-state problem** D. Three-state problem	CLO1	K1
9.	A production rule has a. A set of Rule b. A sequence of steps **c. Both (a) and (b)** d. Arbitrary representation to problem	CLO2	K1
10.	The action 'STACK(A, B)' of a robot arm specify to _____ a. Place block B on Block A b. Place blocks A, B on the table in that order c. Place blocks B, A on the table in that order **d. Place block A on block B**	CLO2	K2
11.	While playing Toy problem, its environment is controlled. Consider the following statements with regard to Tic-tac-toe problem,	CLO2	K2

	i. The player who puts respective mark in a horizontal or vertical line only wins the game ii. The player who puts respective mark in a horizontal or vertical or diagonal line wins the game iii. It is a 3*3 grid & three player game iv. It is a two-player game a. Statements (ii),(iii) are correct **b. Statements (ii),(iv) are correct** c. Statements (i),(iii) are correct d. Statements (i),(ii),(iv) are correct		
12.	The PEAS in the task environment is about_____ 　　　　a) Peer, Environment, Actuators, Sense 　　　　**b) Performance, Environment, Actuators, Sensors** 　　　　c) Perceiving, Environment, Actuators, Sensors 　　　　d) Performance, Environment, Actual, Sensing	CLO1	K1
13.	Which agent deals with the happy and unhappy state? **a.Utility-based agent** *b. Model-based agent* *c. Goal-based Agent* d. Learning Agent	CLO1	K1
14.	Which of the Following problems can be modeled as CSP? 　　a. Monkey Banana Problem 　　b. Camel Banana Problem 　　**c. Map coloring Problem** 　　*d. Missionaries and Cannibal Problem*	CLO2	K2
15.	To overcome the need to backtrack in constraint satisfaction problem can be eliminated by _____ 　　a. **Forward Searching** 　　b. Constraint Propagation 　　c. Backtrack after a forward search 　　d. Omitting the constraints and focusing only on goals	CLO2	K2
PART – B			
Answer all questions		**(5 x 2 = 10 Marks)**	
16.	What are the components of a problem ? List the problem characteristics . <u>Components of problem</u> • The initial state that the agent starts in /Starting state which agent knows itself. • A description of the possible actions/operators available to the agent.	CLO1	K1

- successor refer to any state reachable from a given state by a single action.

- state space of the problem—the set of all states reachable from the initial state by any sequence of actions.

- A path in the state space is a sequence of states connected by a sequence of actions.

- goal test, which determines whether a given state is a goal state.

- A path cost function that assigns a numeric cost to each path.

- The step cost of taking action a to go from one state 's' to reach state 'y' is denoted by c(s, a, y).

problem characteristics

1. Is the problem decomposable ?

2. Can Solution steps be ignored or undone ?

3. Is the Universe Predictable?

4. Is a good solution absolute or relative ?

5. Is the solution a state or a path?

6. What is the role of knowledge?

7. Does the task require interaction with a person ?

17.	Write the agent program for model – based reflex agent.	CLO1	K2

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function REFLEX-AGENT-WITH-STATE( percept) returns action
    static: state, a description of the current world state
            rules, a set of condition-action rules

    state ← UPDATE-STATE(state, percept)
    rule ← RULE-MATCH(state, rules)
    action ← RULE-ACTION[rule]
    state ← UPDATE-STATE(state, action)
    return action
```

18.	**Solve the crypt arithmetic puzzle.** EAT + HOT =OATS	CLO2	K2

EAT	T - 3
HOT	A - 2
OATS	O - 1
	E - 5
5 2 3	H - 7
7 1 3	S - 6
1 2 3 6	
OATS	

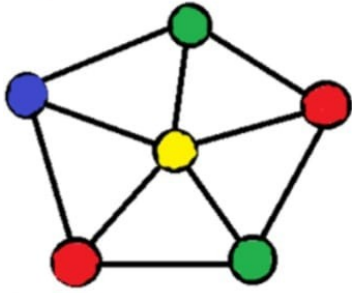| 19.	Give the structure of a learning agent.	CLO2	K1
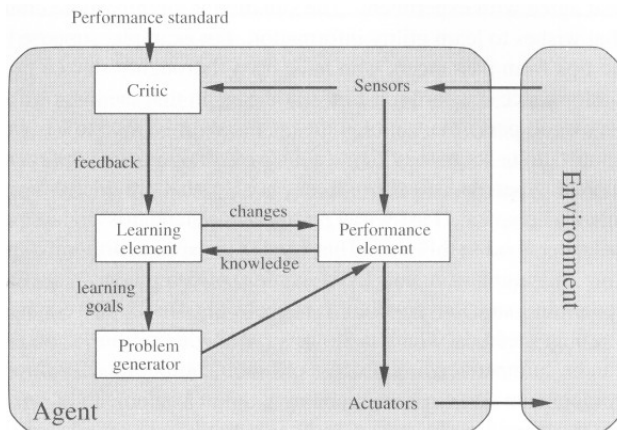
20.	Solve the given map coloring problem using backtracking. Colors that can be used to color the graph are {Red, Green, Blue}	CLO2	K2

Variables : G,R,UP,MP,M,C

$D_i = \{Red, Green, Blue\}$

Given graph cannot be colored with given 3 colors – Red , Green , Blue

K1- Remember, K2 - Understand,   K3 – Apply, K4 - Analyse, K5 – Evaluate, K6 – Create