Class: TY B. Tech
Branch: COMPUTER ENGG Semester: VI Full name of the course: Artificial Intelligence Course Code: 2UCC603 Duration: 1hr.15 min (attempting questions) Max. Marks: 30 +15 min (uploading)

Q. No	Questions	Marks
Q1	The task environment for game of cricket is: A. Fully observable, nondeterministic, dynamic, cooperative, episodic, discrete, multiagent **B. Partially observable, nondeterministic, dynamic, cooperative and competitive, sequential, continuous, multiagent** C. Partially observable, deterministic, static, competitive, sequential, discrete , multiagent D. Fully observable, deterministic, dynamic, cooperative and cooperative, sequential, discrete, multiagent	1M
Q2	Which agent deals with happy and unhappy states? A. Simple reflex agent B. Model based agent C. Learning agent **D. Utility based agent**	1M
Q3	A production rule consists of _____ A. A set of Rule B. A sequence of steps **C. Set of Rule & sequence of steps** D. Arbitrary representation to problem	1M

Q4	In which of the following situations might a blind search be acceptable? A. real-life situation B. complex game **C. small search space** D. cannot be implemented.	1M

Q5	The first widely-used commercial form of Artificial Intelligence (AI) is being used in many popular products like microwave ovens, automobiles and plug in circuit boards for desktop PCs. It allows machines to handle vague information with a deftness that mimics human intuition. What is the name of this AI? A. Boolean logic B. Human logic **C. Fuzzy logic** D. Functional logic	1M
Q6	A test wherein a computer is supplied with a questionnaire and if one cannot determine if the answers to the questionnaire were given by a computer or a human being follows_____ A. Think like human B. Think rationally **C. Act like human** D. Act rationally	1M
Q7	When is breadth-first search is optimal? A. When there is less number of nodes **B. When all step costs are equal** C. When all step costs are unequal D. None of the mentioned.	1M

Q8	The Set of actions for a problem in a state space is formulated by a A. Intermediate states B. Initial state **C. Successor function** D. None of the mentioned	1M
Q9	Uncertainty in the problem is typically addressed by _____ approach. A. Think like human B. Think rationally C. Act like human **D. Act rationally**	1M

Q10	A Professor at the Stanford University coined the word 'artificial intelligence' in 1956 at a conference held at Dartmouth college. A. David Levy **B. John McCarthy** C. Joseph Weizenbaum D. Hans Berliner	1M

Q2	Consider an intelligent agent program that is supposed to help senior citizens at Covid vaccination centers. The agent is supposed to guide people by answering their common queries, guide through the process for various stages and locations in the center.	10 M

Consider an intelligent agent program that is supposed to help senior citizens at Covid vaccination centers. The agent is supposed to guide people by answering their common queries, guide through the process for various stages and locations in the center.

A. Suggest and justify an appropriate agent architecture to implement such an agent. (1+2M)

Learning agent with Utility based agent as the performance element.

B. Draw the block diagram of this proposed architecture and give representative contents in every block. (7M)

How the world evolves?

-People have queries (e.g. having some ongoing medication and if vaccination would be advisable during then) and need answers for them.

-people who are not eligible for vaccination due to age and lack of comorbidities would try to get the vaccine

-social distancing needs to be maintained.

-People need to be warned for wearing masks and using sanitizers

-some people who aren't undergoing vaccination may have to accompany elderly ones inside the center

- The center including waiting area has a mixed population of doctors, volunteers, security guards and patients. One must treat each one of them differently

OR

For the AI agent mentioned in question 1, give:

Assumption: Humanoid volunteer

A. PEAS description (5M)

P(over the scale of 1 to 5)

+4 for successfully answering queries

+10 bonus if no incidence of social distancing violation occurs within a session of 4 hours

-1 for every such social distancing violation

+2 for explaining the procedure well to every newcomer

-3 if it misses a person to direct to correct next stage/pace

	E- Waiting area and the cells in vaccination center, filled with people undergoing vaccination, doctors, security guards, volunteers, chairs, curtains for make shift cabins and some medical equipments probably. A- Speakers, wheels, rotating arms S- proximity sensors, microphones, cameras, OCR readers for reading appointment letters, B. State and justify in one line any 5 properties of the task environment. (5M) Partially observable Dynamic Stochastic Episodic (Every person is a separate episode) Discrete Multiagent	
Q3	Consider the water jug problem which is defined as: You are given two jugs, a 4-litre one and a 3-litre one, a pump which has unlimited **water** which you can use to fill the **jug**, and the ground on which **water** may be poured. Neither **jug** has any measuring markings on it. How can you get exactly 2 gallons of **water** in the 4-litre **jug**? A. Give Problem formulation for this problem. (5M) Initial state : W_J(0,0) Actions: Empty(X), Fill_In(X), Transfer(X,Y) Successor function for transfer action: Given State W_J(2,1) <Transfer(4,3), W_J(0,3)> Successor function for Fill_IN action: Given State W_J(0,1) <Fill_IN(4), W_J(4,1)> Successor function for Empty action: Given State W_J(2,1)	10 M

<Empty(3), W_J(2,0)>

Goal State: W_J(2,_)

Path Cost: 1 per step

B. Draw state space for the problem. Give a sequence of the nodes visited for the given goal using iterative deepening search. (3+2M)