Printed page: **Subject Code:** AMCA0319

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MCA

(SEM: Third Semester THEORY EXAMINATION (2021-2022)

Subject Name: Artificial Intelligence

Time: 3Hours **Max. Marks:100**

General Instructions:

- All questions are compulsory. It comprises of three Sections, A, B, and C.
- Section A -Question No- 1 is objective type questions carrying 1 mark each, Question No- 2 is very short answer type carrying 2 mark each.
- Section B - Question No-3 is Long answer type -I question with external choice carrying 6 marks each.
- Section C -Question No. 4-8 are Long answer type –II (within unit choice) questions carrying 10marks each.
- No sheet should be left blank. Any written material after a blank sheet will not be evaluated /checked.

		SECTION – A		
1.	**All questions are compulsory-**		**[10×1=10]**	**CO**
	a.	**What is artificial intelligence?** (i) putting your intelligence into computer (ii) programming with your own intelligence (iii) making a machine intelligence (iv) playing a game	**(1)**	**CO1**
	b.	**The exploration problem is where …….** (i) Agent contains the knowledge of state and actions. (ii) Agent does not contain the knowledge of state and actions. (iii) Only actions are known to the agent. (iv) None of the above.	**(1)**	**CO1**
	c.	**Which search algorithm requires less memory?** (i) Optimal search (ii) Depth first search (iii) Breadth first search (iv) Linear search	**(1)**	**CO2**
	d.	**Which algorithm is used in the game tree to make decisions of Win/Lose**? (i) Heuristic search algorithm (ii) DFS/BFS algorithm (iii) Greedy search algorithm (iv) Min/Max algorithm	**(1)**	**CO2**
	e.	**…… is a representation in which the control information, to use the knowledge is embedded in the knowledge itself.** (i) Inheritable knowledge (ii) Relational knowledge (iii) Inferential knowledge **(iv)** Procedural knowledge	**(1)**	**CO3**

	f.	**Which of the following are the advantages of Inferential knowledge?** (i) it has a set of strict rules. (ii) It can be used to derive more facts. (iii) Here the truths of new statements can be verified. **(iv)** All of these**.**	**(1)**	**CO3**
	g.	**Machine learning is a field of Artificial intelligence consisting of learning algorithms that…….** (i) At executing some task. (ii) Over time with experience. (iii) Improve their performance. (iv) All of the above.	**(1)**	**CO4**
	h.	**……. is a widely used and effective machine learning algorithm based on the idea of bagging**. (i) Regression (ii) Random forest (iii) Classification (iv) Decision tree	**(1)**	**CO4**
	i.	**The recalled output in pattern association problem depends on?** (i) Nature of input/output (ii) Design of network (iii) Both input and output (iv) None of the mentioned	**(1)**	**CO5**
	j.	**…… can be used for personal assistants' speech-to-text-convertors, etc.** (i) Voice recognition (ii) Image recognition (iii) Optical character recognition **(iv)** Audio recognition	**(1)**	**CO5**
2.	**All questions are compulsory-**		**[5×2=10]**	**CO**
	a.	What do you mean by "Deep Learning" ?	**(2)**	**CO1**
	b.	What is searching in Artificial intelligence ?	**(2)**	**CO2**
	c.	Explain different techniques of Knowledge representation ?	**(2)**	**CO3**
	d.	Write a short-note on reinforcement learning ?	**(2)**	**CO4**
	e.	Write a short-note on pattern recognition ?	**(2)**	**CO5**
SECTION – B				**CO**
3.	**Answer any five of the following-**		**[5×6=30]**	
	a.	Explain utility based agent with a block diagram.	**(6)**	**CO1**
	b.	Why searching is important in AI and also explain types of search algorithm?	**(6)**	**CO2**
	c.	Explain knowledge data discovery process in detail.	**(6)**	**CO3**
	d.	What is machine learning? Discuss the various types of machine learning approaches ?	**(6)**	**CO4**
	e.	Explain water jug problem. Write all the production rules by taking a suitable example.	**(6)**	**CO1**
	f.	Define the term reinforcement learning .How does the passive reinforcement learning differ from active reinforcement learning?	**(6)**	**CO2**
	g.	What do you mean by natural language processing (NLP) and also Explain Fuzzy Logic ?	**(6)**	**CO5**

SECTION – C				
4	**Answer any one of the following-**		**[5×10=50]**	**CO**
	a.	What is AI? Explain its advantages and disadvantages and also explain different types of applications of AI.	**(10)**	**CO1**
	b.	What is an agent ? explain different types of agents in brief and also explain features of Environment	**(10)**	**CO1**
5.	**Answer any one of the following-**			
	a.	What is Heuristics? Explain the significance of heuristics function in the informed search with suitable example.	**(10)**	**CO2**
	b.	Explain Tic-Tac-Toe Game. Explain informed and uninformed search strategies in brief.	**(10)**	**CO2**
6.	**Answer any one of the following-**			
	a.	Write the following sentences into FOPL and prove that "Marcus hates Caesar" using resolution: 1. Marcus was a man. 2. Marcus was a Pompeian. 3. All Pompeiians were Romans. 4. Caesar was a ruler. 5. All Romans were either loyal to Caesar or hated him. 6. Everyone is loyal to someone. 7. People only try to assassinate rulers they are not loyal to. 8. Marcus tried to assassinate Caesar**.**	**(10)**	**CO3**
	b.	Describe Hidden Markov Model. Illustrate how Hidden Markov Model are used for speech recognition.	**(10)**	**CO3**
7.	**Answer any one of the following-**			
	a.	Explain Decision tree with its types and how it is used in AI.	**(10)**	**CO4**
	b.	Explain and differentiate between BFS and DFS methods using suitable example.	**(10)**	**CO4**
8.	**Answer any one of the following-**			
	a.	Explain PCA and LDA in brief. Write short-note on parametric estimation.	**(10)**	**CO5**
	b.	Explain speech recognition in detail and writes its application. What is speech processing?	**(10)**	**CO5**