

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech.

SEM: V - THEORY EXAMINATION (2022 - 2023)

Subject: Artificial Intelligence in Biotechnology

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.
2. Maximum marks for each question are indicated on right -hand side of each question.
3. Illustrate your answers with neat sketches wherever necessary.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.
6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A

20

1. Attempt all parts:-

- 1-a. The characteristics of the computer system capable of thinking, reasoning and learning is known is (CO1) 1
- (a) machine intelligence
 - (b) human intelligence
 - (c) artificial intelligence
 - (d) virtual intelligence
- 1-b. The component of Artificial Intelligence is (CO1) 1
- (a) Learning
 - (b) Training
 - (c) Designing
 - (d) Puzzling
- 1-c. The space complexity of Depth-first search. (CO2) 1
- (a) $O(b)$
 - (b) $O(bl)$

- (c) $O(m)$
- (d) $O(bm)$
- 1-d. Breadth-first search always expands the _____ node in the current fringe of the search tree. 1
(CO2)
- (a) Shallowest
- (b) Child node
- (c) Deepest
- (d) Minimum cost
- 1-e. The language which is not commonly used for AI is: (CO3) 1
- (a) LISP
- (b) PROLOG
- (c) Python
- (d) Perl
- 1-f. The _____ makes the data understandable for humans as we can discover trends and 1
patterns out of it. (CO3)
- (a) Random Data
- (b) Graphical Representation
- (c) Unstructured Data
- (d) None of the above
- 1-g. In the regression equation $Y = 21 - 3X$, the slope is (CO4) 1
- (a) 21
- (b) -21
- (c) -3
- (d) 3
- 1-i. The main function of problem-solving agent is to (CO5) 1
- (a) Solve the given problem and reach the goal
- (b) Find out which sequence of action will get it to the goal state.
- (c) Both a & b
- (d) None of the above
- 1-h. Which agent always does the right things? (CO4) 1
- (a) Rational
- (b) Irrational

	(c) Rational & Irrational	
	(d) None	
1-j.	An Algorithm is said as Complete algorithm if _____ (CO5)	1
	(a) It ends with a solution (if any exists).	
	(b) It begins with a solution.	
	(c) It does not end with a solution.	
	(d) It contains a loop	
2.	Attempt all parts:-	
2.a.	List out some impacts of Artificial Intelligence in everyday life with example. (CO1)	2
2.b.	Define Heuristic function, $h(n)$ (CO2)	2
2.c.	Define data modeling in AI. (CO3)	2
2.d.	Draw and describe the architecture of expert system. (CO4)	2
2.e.	Define reinforcement learning. (CO5)	2
SECTION B		30
3.	Answer any <u>five</u> of the following:-	
3-a.	Discuss the importance to study about well-defined learning problem in AI and write down the different steps to design well-defined learning problem. (CO1)	6
3-b.	Describe the four categories under which AI is classified with examples. (CO1)	6
3-c.	State heuristic search with the help of an example. (CO2)	6
3-d.	Explain any two heuristic searches in detail. (CO2)	6
3.e.	Discuss the different ways to collect Acquiring Data. (CO3)	6
3.f.	Distinguish between strong and weak artificial intelligence. (CO4)	6
3.g.	State the role of intelligent agent in AI. Can a chatbot be trained as an intelligent if yes, explain. (CO5)	6
SECTION C		50
4.	Answer any <u>one</u> of the following:-	
4-a.	Explain how is Machine Learning related to Artificial Intelligence. (CO1)	10
4-b.	Comment on the statement. "Building Machine Learning products: a problem well defined is a problem half solved". (CO1)	10
5.	Answer any <u>one</u> of the following:-	
5-a.	Explain Uniform cost search algorithm. Discuss advantages and disadvantages of UCS.	10

(CO2)

- 5-b. With the help of an example in detail, Explain Best First Search algorithms. (CO2) 10
6. Answer any one of the following:-
- 6-a. Discuss the types of Supervised Learning models in AI. (CO3) 10
- 6-b. Discuss Reinforcement Learning in AI. (CO3) 10
7. Answer any one of the following:-
- 7-a. Discuss the steps to apply conditional formatting to a pivot table. (CO4) 10
- 7-b. Explain the different types of descriptive statistics. (CO4) 10
8. Answer any one of the following:-
- 8-a. Enlist various sectors where machine learning can be applied in the field of biotechnology. (CO5) 10
- 8-b. Discuss artificial neural networks in detail. Describe its types. (CO5) 10