GNITS-R- 18 –117DN

G. Narayanamma Institute of Technology & Science

(**Autonomous**) ***(for Women)***

Shaikpet, Hyderabad- 500 104

IV-B.Tech I-Semester *Regular/Supplementary Examinations, Nov-Dec* - 2023

ARTIFICIAL INTELLIGENCE

(*Common to CSE & CST*)

Max. Marks: 70 **Time: 03 Hours**

Note:

1. Question paper comprises of **Part A** and **Part B**.
2. **Part A** is compulsory which carries 10 marks. Answer all questions in Part A.
3. **Part B** (for 60 marks) consists of **five questions** with **"either" "or"** pattern. Each question carries 12 marks and may have a,b,c as sub questions. The student has to answer any one full question.

PART-A

*(Answer **05** questions. Each question carries **2 marks**)*

Q.No.	Question	Marks	CO	B L
Q.1	a) Define Artificial Intelligence. List the applications of AI.	[02]	CO1	[L1]
	b) Express the following statement in predicate logic "Vijay is a student of GNITS"	[02]	CO1	[L4]
	c) What are the capabilities of an expert systems?	[02]	CO3	[L2]
	d) State Baye's theorem.	[02]	CO4	[L1]
	e) What is meant by parsing.	[02]	CO6	[L2]

END OF PART A

PART-B

*(Answer **05** full questions. Each question carries **12 marks**)*

Q.No.	Question	Marks	CO	B L
Q.2(a)	Explain about the foundations of AI.	[06]	CO1	[L2]
(b)	Discuss the characteristics of AI problem. Explain Towers of Hanoi problem considering it as an AI problem.	[06]	CO1	[L2]
	OR			
Q.3(a)	What is an Agent? Explain different types of agents.	[06]	CO2	[L2]
(b)	Differentiate between informed and uninformed search strategies.	[06]	CO2	[L4]

Q.4(a)	Define Constraint Satisfaction Problem (CSP). How CSP is formulated as a search problem? Explain with an example.	[06]	CO2	[L2]
(b)	Explain Alpha-Beta pruning with an example.	[06]	CO2	[L3]
	OR			
Q.5(a)	Prove the following theorem using deductive inference rules. From $A \rightarrow B \wedge C$, A infer C, from $A \wedge B$, $A \rightarrow C$ infer C.	[06]	CO1	[L4]
(b)	State and explain semantic tableau system in propositional logic.	[06]	CO1	[L2]

Q.6(a)	Discuss about the approaches to knowledge representation in detail.	**[06]**	**CO1**	**[L2]**
(b)	Draw a semantic network representing the following knowledge: Every vehicle is a physical object. Every car is a vehicle. Every car has four wheels. Electrical system is a part of car. Battery is a part of electrical system. Pollution system is a part of every vehicle. Vehicle is used in transportation. Swift is a car.	**[06]**	**CO1**	**[L3]**

OR

Q.7(a)	What is an inference engine? Describe backward and forward chaining mechanism used by an inference engine.	**[06]**	**CO1**	**[L2]**
(b)	Explain about applications of Expert Systems.	**[06]**	**CO3**	**[L2]**

Q.8(a)	Elaborate reinforcement learning in detail.	**[04]**	**CO5**	**[L2]**
(b)	Discuss the procedure to construct the decision tree.	**[08]**	**CO5**	**[L2]**

OR

Q.9(a)	Suppose we are given the probability of mike has a cold as 0.25, the probability of mike was observed sneezing when he had cold in the past as 0.9 and the probability of mike was observed sneezing when he did not have cold as 0.20. Find the probability of mike having a cold given that he sneezes.	**[06]**	**CO4**	**[L3]**
(b)	Illustrate the advantages and disadvantages of Bayesian Belief Network.	**[06]**	**CO4**	**[L2]**

Q.10(a)	Describe the perceptron model for AND function and mention its limitations.	**[06]**	**CO5**	**[L2]**
(b)	Mention any two activation functions with relevant equations and sketch the same. Describe the Multilayer feedforward network with suitable example.	**[06]**	**CO5**	**[L2]**

OR

Q.11(a)	What is semantic web? Explain how resource description framework is used to build semantic web.	**[06]**	**CO6**	**[L2]**
(b)	Explain the phases in sentence analysis with suitable example.	**[06]**	**CO6**	**[L2]**

END OF PART B

END OF THE QUESTION PAPER