Course Code: 20CS0901 **R20**

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code: Fundamentals of Artificial Intelligence (20CS0901) **Regulation:** R20

Course & Branch: B.Tech - CSM & CAD **Year & Sem:** II-II

UNIT-I

INTRODUCTION TO ARTIFICIAL INTELLIGENCE

1	**a)**	Define AI. How it is organized? Explain the categories of it in detail.	**[L1][CO1] [6M]**
	b)	Explain the role of AI in Education and Finance.	**[L2][CO1] [6M]**
2		Identify the areas from which Artificial Intelligence laid its foundation	**[L1][CO1] [12M]**
3	**a)**	Define Intelligent system and Elaborate about its thinking ability.	**[L1][CO1] [6M]**
	b)	Explain the role of AI in Media and E-commerce.	**[L2][CO1] [6M]**
4		How AI evolve over Tic – Tac – Toe Game Playing? Deduce with an example.	**[L2][CO1] [12M]**
5	**a)**	Explain the role of AI in Online and telephone customer service.	**[L2][CO1] [6M]**
	b)	What are the languages that support AI over a period of time? Explain it.	**[L1][CO1] [6M]**
6		Discuss the current trends in Artificial Intelligence.	**[L2][CO1] [12M]**
7	**a)**	Explain the role of AI in News, publishing and writing.	**[L2][CO1] [6M]**
	b)	What are the capabilities of a computer in terms of AI.	**[L1][CO1] [6M]**
8		Discuss in detail about Intelligent System with examples.	**[L2][CO1] [12M]**
9		Recall about the History of Artificial Intelligence in detail.	**[L1][CO1] [12M]**
10		Explain in detail about Intelligent System and when it acts rationally.	**[L2][CO1] [12M]**

Course Code: 20CS0901 **R20**

UNIT-II

PROBLEM SOLVING, PROBLEM REDUCTION AND GAME PLAYING

1		Design 8 Queens's problem using State Space Search with example.	**[L6][CO2] [12M]**
2	**a)**	Illustrate general steps in Problem Solving in Artificial Intelligence.	**[L3][CO2] [6M]**
	b)	Explain in detail about Problem Solving in Control Strategies.	**[L2][CO2] [6M]**
3		Analyze how Heuristic Search Techniques helps in Problem Solving.	**[L4][CO2] [12M]**
4	**a)**	Prepare a Graph tree for Min Max Search Procedure and explain it in detail.	**[L6][CO2] [6M]**
	b)	How water jug problem is effective in problem solving. Deduce with an example	**[L2][CO2] [6M]**
5		Analyze the Alpha-Beta Pruning with an example.	**[L4][CO2] [12M]**
6	**a)**	Illustrate how the Game Playing strategies helps to improve the effectiveness in search?	**[L3][CO2] [6M]**
	b)	Design a Constraint Satisfaction Problem with an example	**[L6][CO2] [6M]**
7	**a)**	Distinguish A* Search and IDA* Search with an example.	**[L4][CO2] [6M]**
	b)	Justify why Greedy Best First Search in is not an optimal searching technique.	**[L5][CO2] [6M]**
8	**a)**	Explain BFS Technique with an example. List the Pros and Cons in it.	**[L2][CO2] [6M]**
	b)	What are the characteristics of a problem? How effectively it can be solved?	**[L1][CO2] [6M]**
9		Discuss about State-Space Search in detail with an example	**[L2][CO2] [12M]**
10	**a)**	Write a short note on Problem Reduction "AND-OR" graphs with an example	**[L1][CO2][6M]**
	b)	Explain about DFS. Deduce it with an example. List its Pros and Cons	**[L2][CO2] [6M]**

Course Code: 20CS0901 **R20**

UNIT-III
LOGIC CONCEPTS

1	**a)**	Describe Propositional Logic along with its syntax and types.	**[L2][CO3] [6M]**
	b)	Prove { P →Q,Q→R } | - (P→R), i.e., P →R is a deductive consequence of { P →Q, Q→R } using Axiomatic System	**[L5][CO3] [6M]**
2	**a)**	Discuss about "Resolution in Propositional Logic" and explain with an example	**[L2][CO3] [6M]**
	b)	Express Tautologies and Contradictions with Truth tables	**[L2][CO3] [6M]**
3		Explain in detail about Logical Connectives in Propositional Logic with examples.	**[L2][CO3] [12M]**
4	**a)**	Natural Deduction System helps to solve Logic Problems. Justify it.	**[L5][CO3] [6M]**
	b)	Prove that $(Q \rightarrow P) \wedge (Q \rightarrow R)) \rightarrow (Q \rightarrow (P \wedge R)$ using Inference rules	**[L5][CO3] [6M]**
5		Describe in brief about Resolution Refutation in Proportional Logic	**[L2][CO3] [12M]**
6		What is Semantic Tableau System in PL. List out the rules in tableaux	**[L1][CO4] [12M]**
7	**a)**	How effectively Propositional Calculus is used in AI? Explain	**[L2][CO4] [6M]**
	b)	Prove $\alpha : (P \wedge Q \rightarrow R) \wedge (\sim P \rightarrow S) \wedge Q \wedge \sim R \wedge \sim S$ is inconsistent using tableaux method.	**[L5][CO4] [6M]**
8		Write the algorithm of "Resolution in Propositional Logic" and explain withan example	**[L1][CO4] [12M]**
9		Discuss the following Terms: i) Universal Quantification ii) Existential Quantification	**[L2][CO4] [12M]**
10		Explain the concept of Predicate Logic with examples.	**[L2][CO4] [12M]**

Course Code: 20CS0901 **R20**

UNIT - IV
KNOWLEDGE REPRESENTATION AND TECHNIQUES

1	**a)**	How representations and Mappings in KR is done? Explain.	**[L2][CO5] [6M]**
	b)	Describe the approaches to Knowledge Representation?	**[L2][CO5] [6M]**
2	**a)**	Distinguish Inferential Knowledge Vs Procedural Knowledge	**[L4][CO5] [6M]**
	b)	How non binary predicates are represented using semantic net. Explain with suitable example	**[L2][CO5] [6M]**
3		How KR using Semantic Network is done. Explain in detail.	**[L1][CO5] [12M]**
4		Make use of Frames as Instances and explain how KR is effectively used.	**[L3][CO5] [12M]**
5		Explain in detail about Extended Semantic Networks for KR with example	**[L2][CO5] [12M]**
6	**a)**	List the four properties that a KR system must have.	**[L1][CO5] [6M]**
	b)	Represent the following facts using semantic nets: • John gave the book to Mary • John is 6 feet tall and that he is taller than Bill	**[L2][CO5] [6M]**
7	**a)**	List the set of primitives and conceptual tenses used in Conceptual Dependency.	**[L1][CO5] [6M]**
	b)	Explain four knowledge representation techniques	**[L2] [CO5] [6M]**
8		Represent the following facts using partitioned semantic nets: • The dog bit the mail carrier. • Every dog has bitten a mail carrier. • Every dog in town has bitten the constable. • Every dog has bitten every mail carrier	**[L2][CO5] [12M]**
9	**a)**	Why Case Grammars are used in Knowledge Representation? Explain	**[L4][CO5] [6M]**
	b)	How Script Structure in Conceptual Dependency Theory is used? Explain the rules in using it	**[L2][CO5] [6M]**
10	**a)**	Represent the following sentence in CD: • Since smoking can kill you, I stopped	**[L2] [CO5] [6M]**
	b)	Describe the important components of a script, with a suitable example.	**[L1] [CO5] [6M]**

Course Code: 20CS0901 **R20**

UNIT - V
EXPERT SYSTEM AND APPLICATIONS AND PROBABILITY THEORY

1	**a)**	What do you mean by expert system technology? Explain.	**[L1][CO6] [6M]**
	b)	Distinguish between forward chaining and backward chaining	**[L2][CO6] [6M]**
2		Explain Components of Expert Systems in detail	**[L2][CO6] [12M]**
3	**a)**	Discuss about Characteristics and Capabilities of Expert Systems	**[L2][CO6] [6M]**
	b)	Explain Expert Systems Limitations in detail	**[L2][CO6] [6M]**
4	**a)**	List out the Applications of Expert System and Explain	**[L1][CO6] [6M]**
	b)	Why Expert System is required? What is the Technology used in it	**[L4][CO6] [6M]**
5	**a)**	List out the Benefits of Expert Systems.	**[L1][CO6] [6M]**
	b)	Discuss about hybrid expert system in detail	**[L2][CO6] [6M]**
6	**a)**	Describe the phases of developing an Expert system.	**[L2][CO6] [6M]**
	b)	Distinguish Expert system and Traditional system.	**[L2][CO6] [6M]**
7	**a)**	What is Rule-based Systems? How Forward Chaining and BackwardChaining is used in Rule-based System	**[L1][CO6] [6M]**
	b)	Distinguish Model-based Expert system Vs Case based expert system	**[L2][CO6] [6M]**
8		What is a Bayesian belief network? By using Bayesian belief network, Calculate the probability that alarm hassounded, but there is neither a burglary, nor an earthquake occurred, and David and Sophia both called the Harry.	**[L3][CO6] [12M]**
9	**a)**	How Probability Theory is used in Theoretical and ExperimentalProbabilities.	**[L2][CO6] [6M]**
	b)	What is Certainty Factor Theory? Why it is considered as part of Expert System in AI. Explain.	**[L4][CO6] [6M]**
10	**a)**	What is Dempster Shafer Theory? List out its Characteristics, Advantages and Disadvantages	**[L1][CO6] [6M]**
	b)	What is Blackboard System Approach in AI. Why it is considered as Expert System Model?	**[L4][CO6] [6M]**

Prepared by: **Dr.R.G.Kumar, Associate Professor, CSE, SIETK**.