## M.Sc. (I.T.) Sem. IV ARTIFICIAL INTELLIGENCE QUESTION BANK (2014 – 2015)

Unit 1: Chapter 1: Introduction		
1.	What is intelligence? How the term 'Artificial Intelligence' was coined?	
2.	What are the core components of AI? Explain.	
3.	Give the perspective of AI by its representation in three-dimension.	
4.	Discuss in brief the development period of AI.	
5.	How knowledge is interpreted with respect to philosophy, science and engineering?	
6.	What is system? Brief about knowledge-based systems.	
7.	List and explain various Applications of AI.	
	Unit 1: Chapter 2: Logic and Computation	
8.	Explain logic according to the classical concepts.	
9.	What is proposition? How is propositional logic different from propositional	
	calculus?	
10.	Explain the derivation of formula using natural deduction method	
11.	List and explain the various connectives to form a WFF.	
12.	What is Equivalence laws? How are they used to derive new relations?	
13.	Define First order logic. Explain the syntax and semantics of FOL.	
14.	Discuss the steps used in the creation of clauses from WFF.	
15.	Convert the following sentences in predicate calculus e.g. Every teacher takes care	
	of their students. Or vice-versa	
16.	State the process of Resolution with an example.	
17.	What are the strategies of Resolution used to find proofs?	
18.	Explain Unification algorithm using substitution method.	
19.	What do you mean by model logic and give its properties?	
20.	What are the different types of temporal logic? Explain its usability.	
	Unit 1: Chapter 3: Heuristic Search	
21.	How search techniques help in finding goal state?	
22.	What are the different types of Search Techniques? Give examples.	
23.	Give solution to the water jug problem using state space. (Consider two jugs.)	
24.	Explain BFS algorithm with an example.	
25.	Discuss the efficiency of Depth First searching technique with an example.	
26.	Compare BFS and DFS search techniques.	
27.	Give an overview of Greedy Best First Search as compared to BFS or DFS.	
28.	Explain A* Algorithm and also prove the property of admissibility in A*	
29.	How optimal path can be obtained using branch and bound technique?	
30.	Explain Hill Climbing Search technique. State its advantages and disadvantages	
31.	State the purpose of TSP with an example.	
32.	Write the algorithm for TSP. Give the worst case complexity of the same.	
33.	Compare the usability of Branch and Bound technique over TSP algorithm.	
24	Unit 2: Chapter 4: Search in Game Playing	
34.	How And/Or graph is implemented for game playing?	
35.	Explain And/Or graph with an example.	
30.	Discuss 11c-1ac-1oe problem with the use of minimax.	
<u>3/.</u>	what is Alpha-beta Search? How does it overcome the problem of Minmax?	
38.	Explain Alpha-beta pruning with an example.	
<i>3</i> 9.	Analyse tic-tac-toe problem using Alpha-beta search method.	

40.	Explain the iterations in IDS with the algorithm.
41.	Enumerate on any one game such as Rubik, Backgammon.
	Unit 2: Chapter 6: Knowledge Representation
42.	How rule-based system is used in modelling human problem-solving behaviour?
43.	With the help of a diagram, explain the structure of RBS.
44.	What is conflict resolution? Explain the various strategies used for selecting a rule.
45.	Explain the working mechanism of forward chaining/backward chaining.
46.	Backward chaining is a depth first search strategy-Justify
47.	State merits and demerits of RBS.
48.	Illustrate the different kind of rules in RBS.
49.	What are Semantic nets? Explain with an example.
50.	How partitioned semantic nets is different from semantic nets?
51.	Discuss the two ways of inference in semantic net.
52.	What are frames? State various properties associated with a frame.
53.	Explain in brief conceptual graphs.
54.	Elaborate on how CG can be converted to FOPL.
55.	What is conceptual dependency?
56.	Describe the semantic rules for conceptual dependency.
57.	Explain the various components that are known as conceptual primitives,
58.	Define Script. Illustrate the various components of Script with an example.
59.	Develop a script model of the model: shopping in a supermarket, going to
	restaurant
60.	How Knowledge can be represented in semantic nets? Draw the semantic network
	of sentence " Aarav gave Arisa a beautiful gift"
	Unit 2: Chapter 7: Automated Reasoning
61.	What is Automated Reasoning? How real world problems are handled?
62.	How default logic helps in reasoning? Explain.
63.	What are the problems which occur on default reasoning?
64.	Define Default reasoning and state all its features.
65.	What do we mean by the term Closed World Assumption? Elaborate with an
	example.
66.	Explain the framework of MBR.
67.	What are the disadvantages of Rule based systems? How is it overcome?
68.	What is GDE? Give its features and tasks.
<u>69.</u>	Explain the assumption of GDE by explaining an electronic circuit.
70.	What are the different modes of diagnosis for model-based systems?
/1.	How CBR systems differ from MBR systems?
72.	Explain CBR with their components and functions.
/3.	Explain any three models of CBR with their comparison in processes used .
74.	Elaborate on the various types of representation techniques in CBR process.
75.	Inustrate on different types of Case Indexing
/6.	How memory is used for storage in CBR? Explain the various models.
//.	Explain the importance of retrieval in CBK cycle. Elaborate in detail.
/8.	Enumerate on the various classes of Single-case adaptation.
/9.	List and explain the techniques used in CBK for adaptation.
80.	Write a note on Multimodal reasoning.
01	Evaluate the concern of Devasion notwork in the concerning
ð1.	Explain the concept of Bayesian network in representing knowledge in an uncertain
82	Derive and Define Bayes Theorem
02.	

83	What is the relation between hypothesis and evidence in Bayesian Network?
84.	How Dempster and Shafer theory of evidence was used to overcome Bayes'
0	probabilistic theory? Explain the belief functions with an example.
85	Give a comparative view of Uncertainity measurement methods
86.	What are the limitations of Bayes method? Illustrate with examples.
87.	For what types of problems Bayesian networks are suitable? Give proper reasoning
071	for your statements.
88.	What are the different strategies for implementing confidence factor?
89.	Develop a Bayesian network for a tutoring system showing its components as
	student, tutor and subject
90.	For the following facts given below:
	Student require book(0.6)
	Student require audio(0.3)
	Student require video(0.2)
	What are the measures of belief that a student may require a book and may require
	either audio or video?
91.	Write a note on probabilistic logic/Deterministic method.
	Unit 3: Chapter 8: Knowledge Acquisition
92.	Explain the basic processes that are involved in knowledge acquisition for identifying
	problems.
93.	Brief about the components of knowledge acquisition system with a diagram.
94.	What is the working procedure of automatic knowledge acquisition?
<u>95.</u>	Write a note on Machine Learning
<u>96.</u>	What is Version Space? Explain with an example.
97.	With an example, explain candidate elimination algorithm.
98.	Briefly explain ID3 and illustrate classification of height in to short, medium and tall.
99.	What is the purpose of analogical reasoning?
100.	What are the strategies that are involved in the learning process through analogy?
101.	Explain the process of Explanation based learning with an example.
102.	What is Inductive learning? Explain
105.	Unit 4: Chapter 11: Planning (Anandita Das)
104	What is planning? Why is it pacessary?
104.	Explain the components of planning system?
105.	Illustrate on the techniques that are used to detect dead-ends
100.	Who are planning agents? How are they helpful in planning systems?
108.	State the difference between hierarchical and non-hierarchical planning.
109.	Explain the different schemes under planning.
110.	How backward state space planning is different from forward state space planning?
111.	Write a note on Goal Stack Planning.
112.	Briefly explain the working of Goal stack planning with an example.
113.	Elaborate on Generate-and-Test Algorithm,
114.	Explain the "blocks world problem" as an example for planning
115.	What are the difficulties faced with planning systems?
	Unit 4: Chapter14: Constraint Satisfaction Problem (Anandita Das)
116.	What is CSP? Explain its role in AI.
117.	Explain Constraint Satisfaction problem with a finite domain.
118.	How CSP uses search procedure to find solution? Explain.
119.	What is backtracking? State its limitations.
120.	Explain the various types of Consistence driven techniques

121.	Compare forward checking over backtracking scheme	
122.	How a CS problem is represented? Give an example	
123.	Briefly explain Map-colouring problem/ N-Queens problem.	
124.	What is Satisfiability problem?	
125.	Show the effectiveness of local search in CSP problems.	
Unit 5: Chapter12: Knowledge Based System (R. B. Mishra)		
126.	Which are the basic components of KBS? Explain	
127.	Discuss the structure of an expert system.	
128.	Explain the expert system used for medical diagnosis/ACE/Lisp system(any one)	
129.	What is ES Shell? Explain Automatic Reasoning tool.	
130.	Explain Knowledge Engineering Environment.	
131.	Explain Knowledge Engineering system.	
132.	Explain the various components of a Web-based expert system.	
133.	Elaborate any two Web-based expert systems.	
Unit 5: Chapter18: Prolog (Anandita Das)		
134.	Explain the use of prolog in AI Programming.	
135.	What is fact in prolog? Give the syntax and semantics with an example.	
136.	Explain the syntax of rule with an example.	
137.	Elaborate on each of the syntax of Prolog.	
138.	Detail about the main concept of prolog programming with an example.	
139.	Which are the important aspects of Prolog? Explain any one	
140.	Explain List Manipulation in prolog	
141.	Give examples to show head and tail of a list.	
142.	Explain the use of functions and relation in prolog.	
143.	All problems in prolog.	