

**YMCA UNIVERSITY OF SCIENCE AND TECHNOLOGY, FARIDABAD**  
**M Tech 3<sup>rd</sup>**  
**Knowledge Based System Design (MTCE-16-201)**

**Max. Time: 3:00 Hrs**

**MM:60**

**Note: Question number 1 in PART-1 of question paper is compulsory and is of 20 marks. Attempt any four questions (each of 10 marks) out of six questions in PART-2.**

**PART-1**

- Q1 a) What are different components of intelligence. (2)  
b) What are areas where AI techniques are applied. (2)  
c) What do you mean by problem state space. (2)  
d) Give two heuristic functions for 8-block problem. (2)  
e) What do you mean by representation of an AI problem. (2)  
f) What is a fuzzy relation. How is it used in fuzzy inference mechanism. (2)  
g) What is difference between procedural and declarative knowledge. (2)  
h) What are basic challenges while acquiring the knowledge from a domain. (2)  
i) Write about PROSPECTOR. (2)  
j) What is a task environment of an agent. (2)

**PART-2**

- Q2(a) Differentiate between the terms "System acting rationally" and "System thinking rationally". (4)  
(b) What are different components of a production system? How is it different from conventional system. (3,3)
- Q3 (a) Represent chess playing problem using the paradigm of production system. (6)  
(b) Explain and give algorithm Hill climbing. (4)
- Q4 (a) Represent following facts using semantic nets. (3)  
(i) Mohan reads a book given by Radha.  
(ii) Sagar who is 180 cm is taller than Ramesh.  
(iii) All Indian loves Gandhi ji.  
(b) Explain why unification is necessary process during the of resolution predicates not in propositional logic. (3)  
(c) Explain the resolution by using refutation of predicates. (4)
- Q5 (a) Explain classical planning in AI using Air Cargo example. (4)  
(b) Write short note on phases in natural language processing. (4)  
(c) Give architecture of rule expert system. (2)
- Q6 (a) Explain Bayes theorem and Dempster-Shafer Theory. (3,3)  
(b) What is an intelligent agent. What is agent function. What are the constituents necessary to make an agent rational. (4)
- Q7 (a) Apply the alpha decomposition theorem on following fuzzy set.  
 $A = \{0.2, 0.3, 0.4, 0.6, 0.9\}$   
Make set A as Normal set also. (4,1)  
(b) Explain and give Genetic Algorithm. (5)