Printed Pages – 5 Roll No. : .....

333733(22)

B. E. (Seventh Semester) Examination, April-May 2021

(New Scheme)

(IT Engineering Branch)

ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *In all question part (a) is compulsory. In remaining part (b), (c) and (d). Attempt any* ***two*** *parts from each question.*

Unit-I

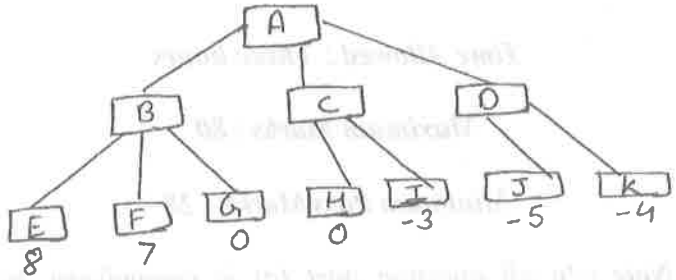
1. (a) Discuss Alan Turing's major contribution in the field of AI. 2

(b) Explain problem solving technique in AI. Give state space representation for 8 puzzle problem : 7

2	8	3		1	2	3
1	6	4	→	8		4
7		5		7	6	5

Initial stage Final stage

(c) Consider the 2-ply search as shown below. If the first plays is a maximizing player. What moves should be chosen under the Min-Max strategy? 7



(d) Explain problem reduction algorithm using AND-OR graph. 7

Unit-II

2. (a) Describe frame with example. 2

(b) Enumerate the CD primitives. Give the conceptual graph representation for the following sentence : "John fertilized the field with a sprayes" 7

(c) Obtain the clausal form of the following predicate expression. 7

$$\exists_x \forall_z \left[\forall_y \, p\{f(x), y, z\} \rightarrow \{ \exists \cup Q(x,u) \wedge \exists \cup R(y,v) \} \right]$$

(d) Write a script for supermarket shopping as knowledge representation. 7

Unit-III

3. (a) What is fuzzy logic? 2

(b) Explain the source and type of uncertainty. Also State Bayes Theorem. 7

(c) What do you mean by learning in AI? Explain different types of learning. 7

(d) Write short note on : 7

(i) Bayesian Belief Network

(ii) Dempster–Shafer Theory

Unit-IV

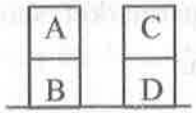
4. (a) Differentiate between ATN & RTN. 2

(b) Explain the Syntactic and Semantic analysis in NLP. 7

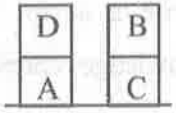
(c) What do you mean by Passing? Explain Top down and Bottom up passing with an example. 7

(d) Give a block world problem scenario :

Initial State



Goal State



A Robot Arm is given to move the blocks Represent the problem and give a planning scheme using STRIPs language. 7

Unit-V

5. (a) Explain backtracking in prolog. What is the use of cut, fail predicate in prolog? 2

(b) Explain the basic characteristics of an expert system. Describe the architecture of an Expert system with suitable diagram. 7

(c) Describe knowledge acquisition and knowledge Manipulation. 7

(d) Define "List" in prolog. Write a program in Prolog. 7

(i) To find the first and last element in a list

(ii) Monkey Banana Problem