322831(22)

APR-MAY 2022

B. E. (Eighth Semester) Examination, 2020

(New Scheme)

(CSE Engg. Branch)

ARTIFICIAL INTELLIGENCE and EXPERT SYSTEMS

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

*Note : Part (a) from each question is compulsory. carry 2 marks. Attempt any **two** parts from (b), (c) and (d) carry 7 marks each.*

Unit-I
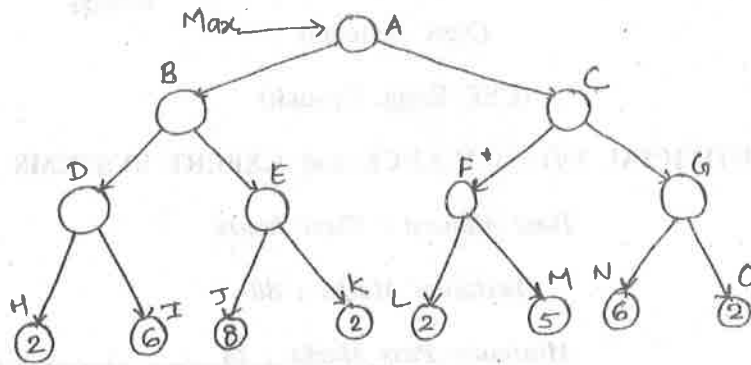
1. (a) Define Turing test.   2

   (b) Define state space for classical water jug problem with 4 litre and 3 litre jug. How can we get exactly 2 litres of water in 4 litre jug?   7

(c) Explain Hill climbing search algorithm with its limitations.　　7

(d) Prun the search tree with α-β cutoff pruning technique and calculate the value of root node 'A'.　　7

Unit-II

2. (a) Define fact and quantifier.　　2

(b) Convert the following sentence in FOPL (First Order Predicate Logic) :　　7

   (i)   All employee earning 1500 Rs. or more per year pay taxes.

   (ii) Some employees are sick today.

   (iii) No employee earns more than president.

(c) Explain skalemization and unification.　　7

(d) Draw a semantic network for following :　　7

   (i)   Scooter is a two wheeler.

   (ii) Motorbike is a two wheeler.

   (iii) Motorbike is a moving vehicle.

   (iv) Moving vehicle has engine.

   (v) Moving vehicle has electrical system.

   (vi) Moving vehicle has fuel system.

   (vii) Two wheeler is a moving vehicle.

Unit-III

3. (a) State Baye's theorem.　　2

(b) Compare supervised and unsupervised learning.　　7

(c) Explain Dempster-Shafer theory and truth maintenance systems.　　7

(d) Consider two fuzzy subsets of set 'X',

$$X = \{a, b, c, d, e\}$$

referred to as 'A' and 'B' as

$$A = \{1/a, 0\cdot3/b, 0\cdot2/c, 0\cdot8/d, 0/e\}$$

$$B = \{0\cdot6/a, 0\cdot9/b, 0\cdot1/c, 0\cdot3/d, 0\cdot2/e\}$$

Find out the support, cardinality, union and intersection. 7

Unit-IV

4. (a) Define language. 2

   (b) Explain the steps of Natural Language Processing. 7

   (c) Explain the components of planning system. 7

   (d) Explain block world problem with example. 7

Unit-V

5. (a) Write example of Expert System (any two). 2

   (b) Explain expert system architecture with neat diagram. 7

   (c) Explain list manipulation functions of LISP. 7

   (d) Explain backtracking in PROLOG. What is functioning of cut (!) operator in PROLOG? 7