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APR-MAY

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

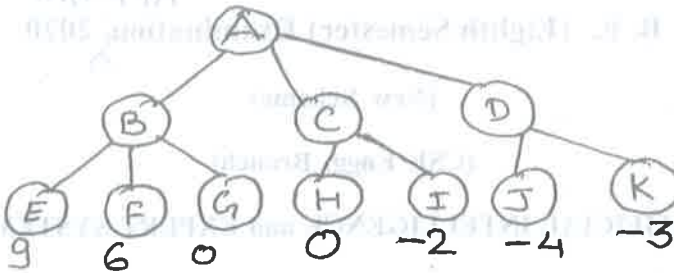
Note : Attempt all questions. Part (a) of each question is compulsory and carries 2 marks and attempt two parts from (b), (c) and (d) and carry 7 marks each.

Unit-I

1. (a) Comment on the performance issue of dept-first and breadth-first search technique.
- (b) Solve the crypt arithmetic problem :
SEND + MORE = MONEY

and describe how heuristic is implemented in it.

- (c) Describe the mini-max search procedure. Apply $\alpha - \beta$ pruning to the following game tree if maximizer is playing at node A.



- (d) Explain AO* Algorithm with suitable example.

Unit-II

2. (a) What do you understand by well-formed formula?
- (b) Consider the following statements :
- (i) Anyone passing his history exams and winning the lottery is happy.
 - (ii) Anyone who studies or is lucky can pass all his exams.
 - (iii) John did not study but John is lucky.
 - (iv) Anyone who is lucky wins the lottery.

[3]

Represent the above statements in FOPL and CNF and prove that John is happy.

(c) Describe the meaning of the following primitive Act in conceptual dependency with suitable example : GRASP, INGEST, MBUILD, ATRANS, PROPEL, MTRANS, MOVE, PTRANS.

(d) Describe knowledge representation using semantic network. Give the semantic network for the following data :

Tom is a cat. Tom caught a bird. Tom is owned by John. Tom is ginger in colour. Cats like cream. The cat sat on the mat. A cat is a mammal. A bird is an animal. All mammals are animal. Mammals have fur.

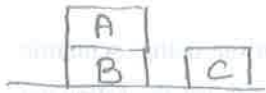
Unit-III

3. (a) Enlist the operations available in Fuzzy logic?
- (b) What do you understand by learning in Artificial Intelligence? Describe the learning model used in AI.
- (c) Illustrate the need of Dempster shafer theory and also explain it.
- (d) What do you understand by probabilistic reasoning? Explain Bayesian Belief Network.

[4]

Unit-IV

4. (a) What is top down parsing?
- (b) What do you understand by planning? Explain the different components of planning system.
- (c) Solve the following block world problem :



Initial state



Goal state

- (d) Consider the statement given below :
- “The big tree shades the old house by the stream”.
- Describe how a recursive transition network recognizes the above statement.

Unit-V

5. (a) Comment on the importance of expert system.
- (b) Discuss the expert system architecture based on non-production system.
- (c) Sketch the architecture of an expert system, showing the major components and interrelationships between these components.
- (d) Write a program in PROLOG to calculate the factorial of any number.