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Fifth Semester B.E. Degree Examination, Dec.2023/Jan.2024 Artificial Intelligence

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Explain with production rules for the water jug problem, where 2 jugs are 4 gallons and 3 gallons to get exactly 2 gallon of water. (10 Marks)
- b. Distinguish between breadth first search and depth first search. (10 Marks)

OR

- 2 a. Explain problem characteristics for a heuristic search. (10 Marks)
- b. Consider the following graph, Find the cost effective path from state A to final state J.

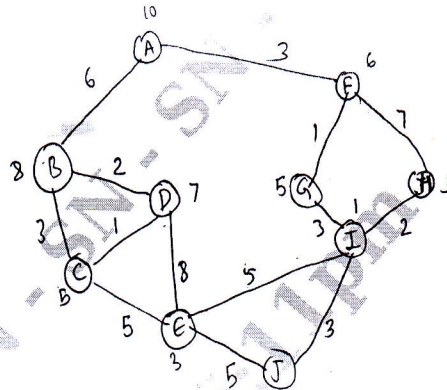


Fig Q2(b)

(10 Marks)

Module-2

- 3 a. How do you differ between forward and backward reasoning with example. (10 Marks)
- b. Consider the following set of facts, represent it in predicate logic (10 Marks)
 - i) Marcus was a man
 - ii) Marcus was a Pompeian
 - iii) Marcus was born in 40AD
 - iv) All men are mortal
 - v) All Pompeians died when the volcano erupted in 79AD
 - vi) No mortal lives longer than 150 year

OR

- 4 a. Explain Proportional resolution algorithm. (10 Marks)
- b. Explain unify algorithm for example $\{x = int \ y = y \rightarrow x\}$ (10 Marks)

Module-3

- 5 a. Explain with an example, how TMS provides the ability for backtracking. (10 Marks)
- b. Explain Baye's theorem. Using Baye's theorem suppose a screening test for a disease has 1% of false positive rate and 1% of false negative rate. Suppose the rate of disease in the population is 0.002. Find the percentage of randomly selected persons tested positive. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

OR

- 6 a. Explain Semantic Nets, write a Semantic Net representing a sentence "John gave the book to Mary" (10 Marks)
 b. Explain property inheritance algorithm for frames. (10 Marks)

Module-4

- 7 a. Explain Conceptual Dependency (CD). Draw the CD representation for "John ate a Frog". (10 Marks)
 b. Define script. Write a restaurant script for "John went out to restaurant last night. He ordered steak. When he paid for it, he noticed that he was running out of money. He hurried home since it has started to rain" (10 Marks)

OR

- 8 a. Explain CYC. (05 Marks)
 b. State where in CYC ontology following concept should fall
 i) Cat
 ii) Count case
 iii) New York times
 iv) Frames
 v) Glass of water (05 Marks)
 c. Write min-max algorithm. Apply min-max algorithm for the below graph

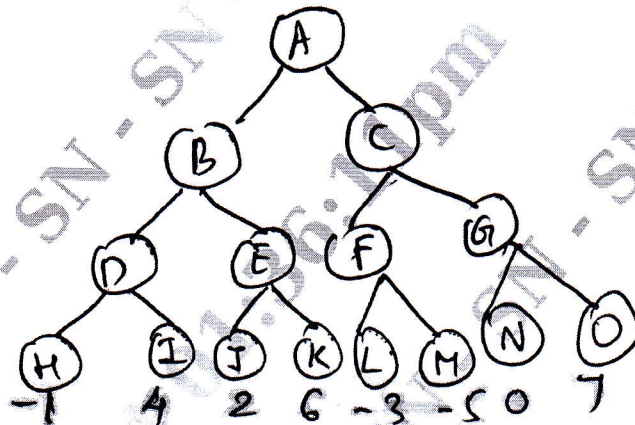


Fig Q8(c)

(10 Marks)

Module-5

- 9 a. Explain the components of NLP. (10 Marks)
 b. Explain Augmented Transition network, draw an ATN network for a fragment of English. (10 Marks)

OR

- 10 a. Explain : i) Rote learning ii) Learning by taking advice (08 Marks)
 b. Explain Winston's learning program. (06 Marks)
 c. Explain knowledge acquisition for expert system. (06 Marks)
