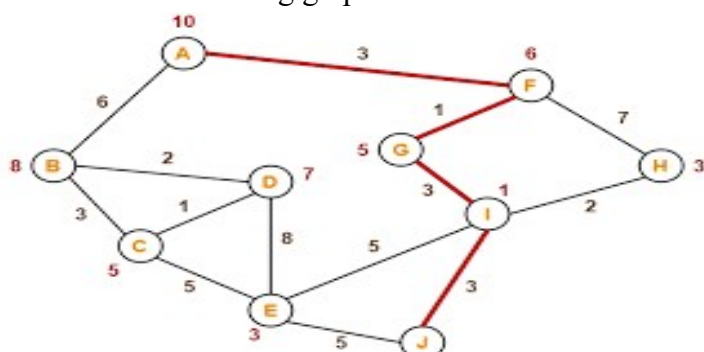


Mid-West University
Examinations Management Office
End Semester Examinations 2081

Bachelor level/ B.E. Computer/ 7th Semester
Time: 3 hours
Subject: Artificial Intelligence (CO519)

Full Marks: 50
Pass Marks: 25

- Attempt all the questions
 - Figures in the margin indicate full marks.
 - Assume suitable values, with a stipulation, if necessary.
 - Candidates are required to answer the questions in their own words as far as possible.
1. Discuss the evolution of AI from its inception to present day, highlighting key milestones and advancements. Analyze the potential impact of AI on today's job market. (3+2)
 2. What are production systems? Explain the concept of a state-space in AI problem-solving and provide an example of how it is used in a search algorithm. (1+4)
 3. Consider the following graph.



The numbers written on edges represent the distance between the nodes. The numbers written on nodes represent the heuristic value. Find the most cost-effective path to reach from start state **A** to final state **J** using **A* Algorithm**. (5)

4. Explain the different types of inference methods to draw conclusion. Write the different types of inference rules. (3+2)
5. Consider the following statement "Jack owns a dog, Every dog owner is an animal lover, No animal lover kills an animal. Either Jack or curiosity killed the cat, who is named Tuna" using resolution principle prove that, curiosity killed the cat. (5)
6. What are the issues in knowledge representation? A doctor knows that the disease meningitis causes the patient to have a stiff neck 40% of the time. The doctor also knows that the probability that a patient has meningitis is 1/30,000, and the probability that any patient has a stiff neck is 1%. Find the probability that a patient with a stiff neck has meningitis. [Use Bayes's Theorem] (2+3)
7. Define genetic algorithm. Suppose a chromosomes are of the form $x=abcdefgh$ with the fixed length of eight genes, each gene can be any digit between 0 to 9. Let the fitness of individual x be calculated as $f(x) = (a+b) - (c+d) + (e+f) - (g+h)$ and let the initial problem consist of four individual with following chromosomes. (1+4)
8. Explain the perceptron learning rules. Implement OR function using ADLINE.
9. What are expert systems, and how do they emulate human decision-making processes? Explain the core components of an expert system and their functions. (2+3)
10. Write Short Notes on **Any Two**. ($2.5 \times 2 = 5$)
 - a) Back propagation
 - b) Natural Language Processing
 - c) Machine Vision
 - d) Fuzzy logic

The End