Question 1

a. Discuss, using examples, how inferencing is done both in production rules and frames. [10 Marks]

b. What problem does the Rete algorithm seek to address in Production Systems? Explain how the algorithm reduces this problem. Use an example to illustrate your answer. [5 Marks]

c. Using the tree below, determine the move that MAX would make. Be sure to show how you arrived at your answer. Will alpha-beta pruning improve the performance of the minimax algorithm in this case? Explain. [5 Marks]
Question 2

a. What information is required to define a search problem? [4 Marks]

b. Prolog is a declarative language. What does this mean? This declarative nature is said to suit search problems. Why is this so? [6 Marks]

c. Do you agree that Prolog is a purely declarative language? Give sample code to support your answer. [5 Marks]

d. Describe the difference between informed and uninformed search strategies. Give an example of a search strategy that falls under each group. [5 Marks]

Question 3

a. All Caribbean countries are islands. Jamaica is a Caribbean country and it has waterfalls. All tourists visit all beautiful islands, an island is considered beautiful if it has waterfalls. Jane is a tourist.

i. Represent the sentences above in First Order Predicate Calculus (FOPC). [5 Marks]

ii. Prove the following by refutation: Jane will visit Jamaica. Explain how your arrived at your answer. [8 Marks]

b. What type of reasoning is not suitable for logic? Show how production systems and frames can handle this type of reasoning. Use examples to illustrate your answer. [7 Marks]
**Question 4**

a. Choose two sub areas of AI that were presented by you or your colleagues during the term that you think could be incorporated into businesses in Jamaica. Briefly describe this sub area and say why/how it could be used in the business. [10 Marks]

b. Assume that you are trying to find your way out of a maze. At each intersection, you will always try the left path before the right path. When you reach a dead end you must go back to the last intersection and try an alternative path if possible. [10 Marks]

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i. Using the labeled points as your nodes show the search tree that would be generated using the strategy described above. What type of search is this? Explain.

ii. Explain what problems might be experienced, in general, in using this search strategy.

iii. Describe two ways in which this search can be modified to overcome the problems described in 4b) ii.