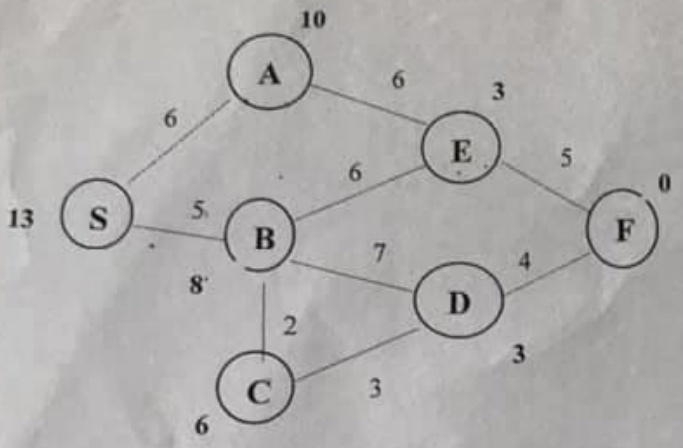
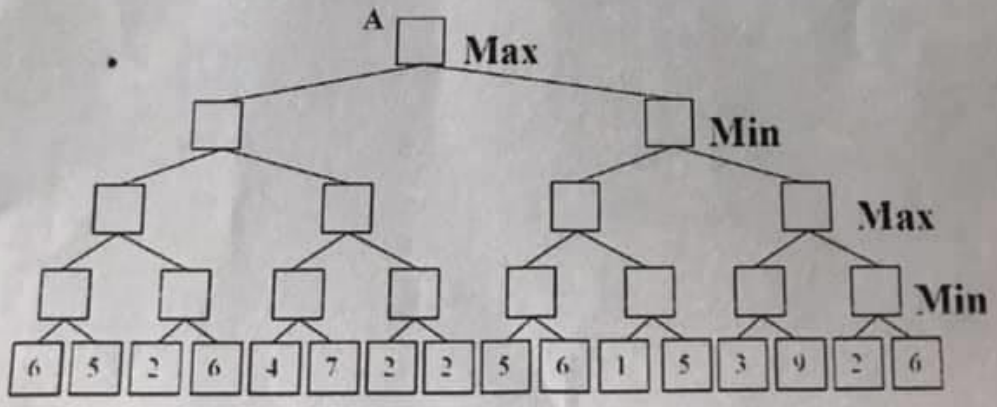
Final exam (2 pages)

Class INT3401 21 (Time: 90 minutes)

Question 1. Given the graph below. The length of the edge is the corresponding value on the edge. These heuristics function for the given graph by annotating each node with a value respectively. Find the shortest path from S to F by A* algorithm?



Question 2: Given game tree below:



1) Calculate the value of **A** root node by Min-Max algorithm?

2) Calculate value of **A** root node by α-β pruning algorithm? Leaf nodes for pruning?

Question 3: Given the training data in the table below (Buy Computer data):

Tuổi	Thu nhập	SV	Chứng chỉ	Mua
<=30	high	no	fair	no
<=30	high	no	excellent	no
31...40	high	no	fair	yes
>40	medium	no	fair	yes
>40	low	yes	fair	yes
>40	low	yes	excellent	no
31...40	low	yes	excellent	yes
<=30	medium	no	fair	no
<=30	low	yes	fair	yes
>40	medium	yes	fair	yes
<=30	medium	yes	excellent	yes
31...40	medium	no	excellent	yes
31...40	high	yes	fair	yes
>40	medium	no	excellent	no

Using Naive Bayes method, predict student X = (**31<=Tuổi <=40, Thu nhập = medium, SV = yes, Chứng chỉ = Fair**) buys computer?

Question 4: Suppose we want to classify potential bank customers as good creditors or bad creditors for loan applications. We have a training dataset describing past customers using the following attributes: Marital status {married, single, divoreed}, Gender {male, female}, Age {[18..30[, [30..50[, [50..65[, [65+]}, Income {[10K..25K[, [25K..50K[, [50K..65K[, [65K..100K[, [100K+]}.

3.1. Design a neural network that could be trained to predict the credit rating of an applicant.

3.2. Show the reasons why the backpropagation algorithm in neural network calculates efficiently based on graph?