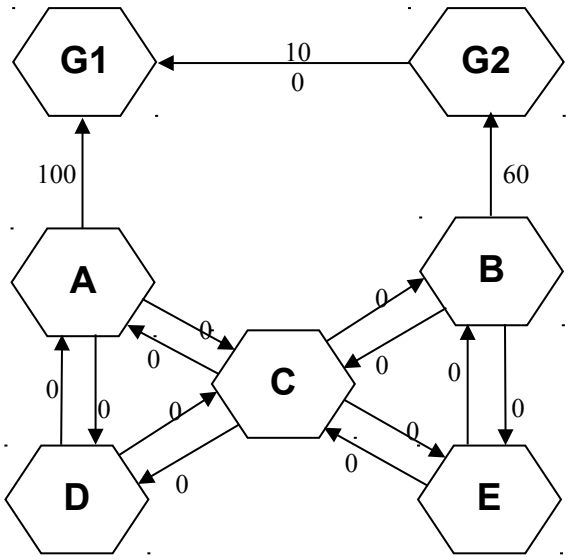
# CE802 Class Problem Sheet

Q(1) In the following state transition diagram, the numbers alongside each arrow indicate the reward associated with that transition.

(a) Calculate the discounted cumulative value of each state if the discount factor is 0.5.

(b) Calculate the Q values for the transitions out of state E.




Q(2)

(a) Opinion pollsters attempt to predict the results of elections by asking a random sample of the electorate what their voting intentions are. One of the difficulties they face is that some people believe that voting is a private matter and hence refuse to answer the question. Rather surprisingly, such people are often quite willing to answer all sorts of other questions concerning their socioeconomic status. It has been suggested that machine learning methods might be used to make predictions of the voting intentions of those who refuse to disclose them.

You are asked to write a detailed proposal for a pilot study to investigate whether machine learning procedures could be used successfully to solve this problem. Your answer should discuss:

- the type of predictive task that must be performed;
- the learning procedure (or procedures) you would choose and the reason for your choice;
- the data you would use for training;
- how you would evaluate the success of your system.

(b) Suppose that your pilot study had proved successful and so your method was used in predicting the results of a real election. Suppose also that, after the results of the election have been announced, it appears that your method had been less successful than the results of the pilot study had suggested. Discuss why this might have happened.