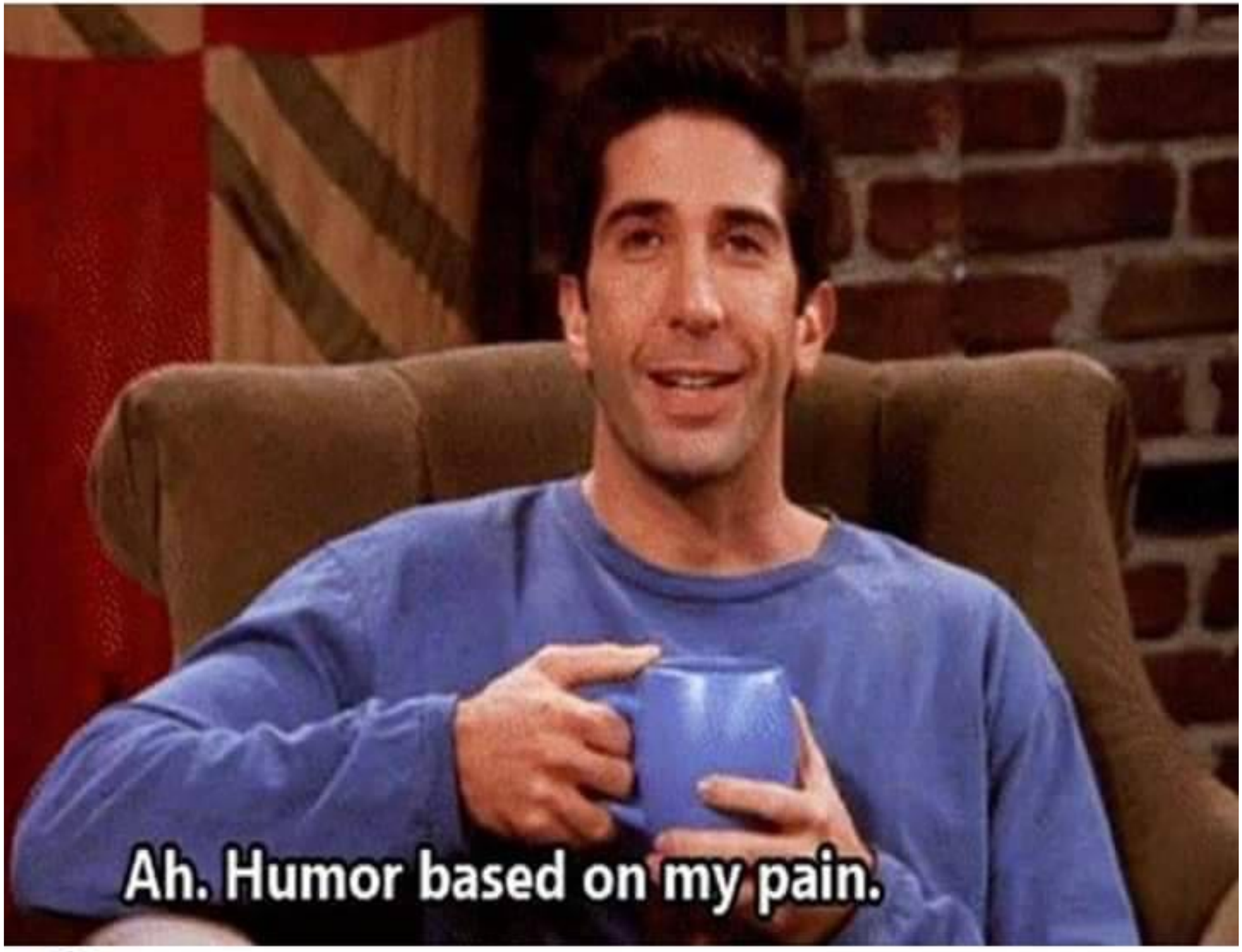
Seeing exam memes like...



CONTEXT

Cngratulations! You have just been hired by DBBA Bank, a digital bank with a lot of customers throughout the UK. Your first task is to analyse a network of financial transactions with the goal of spotting money laundering. Your data contain all transactions from all the DBBA Bank’s customers.

CONTEXT

This includes payments, transactions between customers, and money transfers between different accounts (remember that a customer may have more than one account).

CONTEXT

Describe how you would model the data as a network.
Do so by answering the following questions:

QUESTION 1

i. What type of network would this be (e.g., single-layer, multipartite, tree, etc.)?

QUESTION 1

ii. What do the nodes represent?

QUESTION 1

iii. What do the links represent?

QUESTION 1

iv. Is the network weighted or unweighted?

QUESTION 1

v. Is the network directed or undirected?

QUESTION 2

Given the current economic turmoil, DBBA Bank wants to explore whether they should change their asset allocation. To do so, you are asked to perform a temporal analysis of the UK's stock price correlation network. You decide to do so by building the minimum spanning tree of the network for each month of data in the last year.

QUESTION 2

However, its degree has progressively decreased, and now Meme Invest is not even a hub anymore.

Based on this, answer the following questions:

QUESTION 2

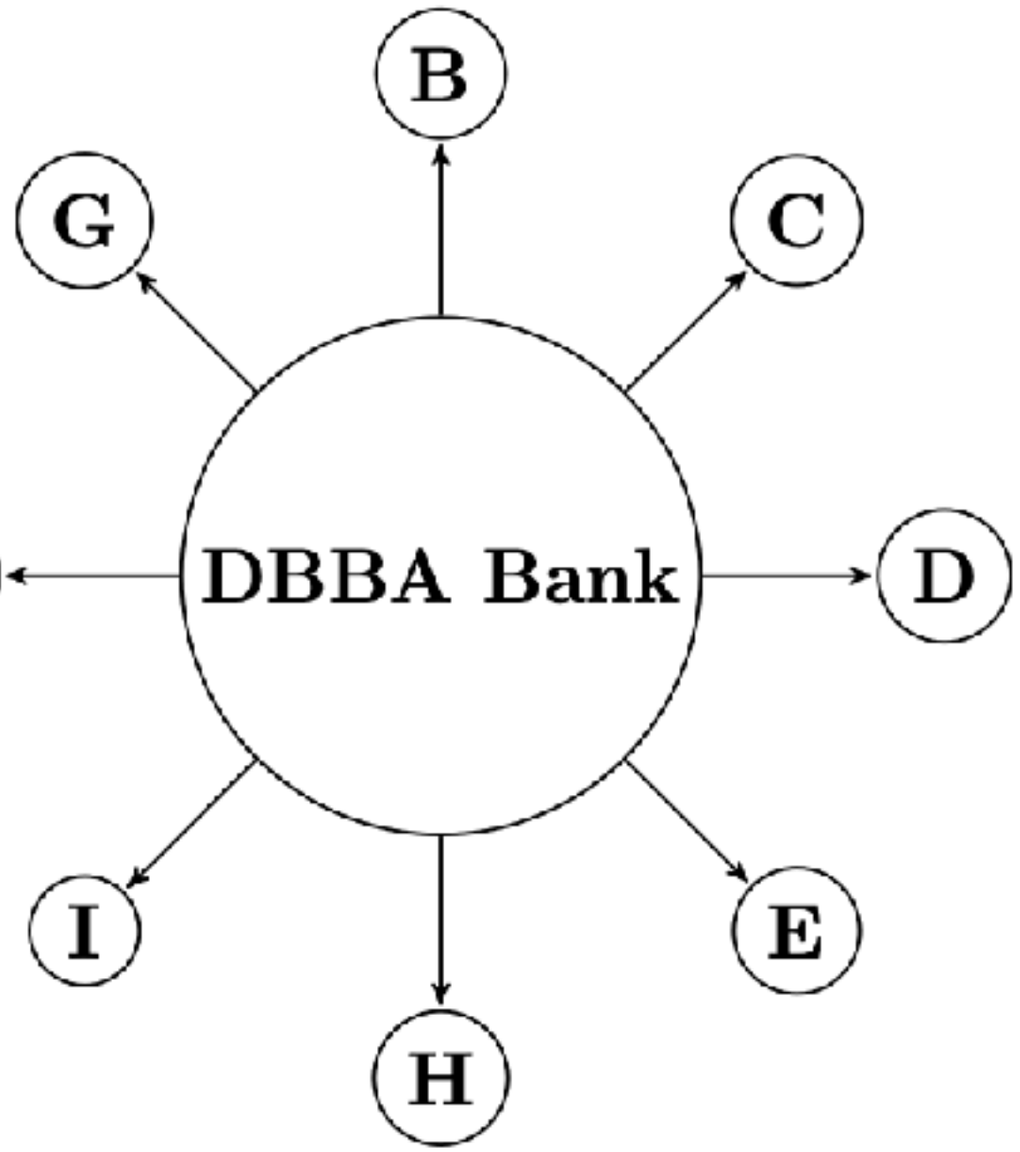
i. Given what you know about Meme Invest and its position in the MST, what could be the cause of its degree dropping?

QUESTION 2

ii. How can DBBA Bank use this result?

QUESTION 3

Consider the following interbank loan ego-network:



(c)

QUESTION 3

i. List the nodes that belong to the largest weakly connected component
and the nodes that belong to the largest strongly connected component.

Justify your answer.

QUESTION 3

ii. Comment on the centrality of the nodes in the network.

QUESTION 3

iii. Discuss the robustness of the network (maximum five sentences).

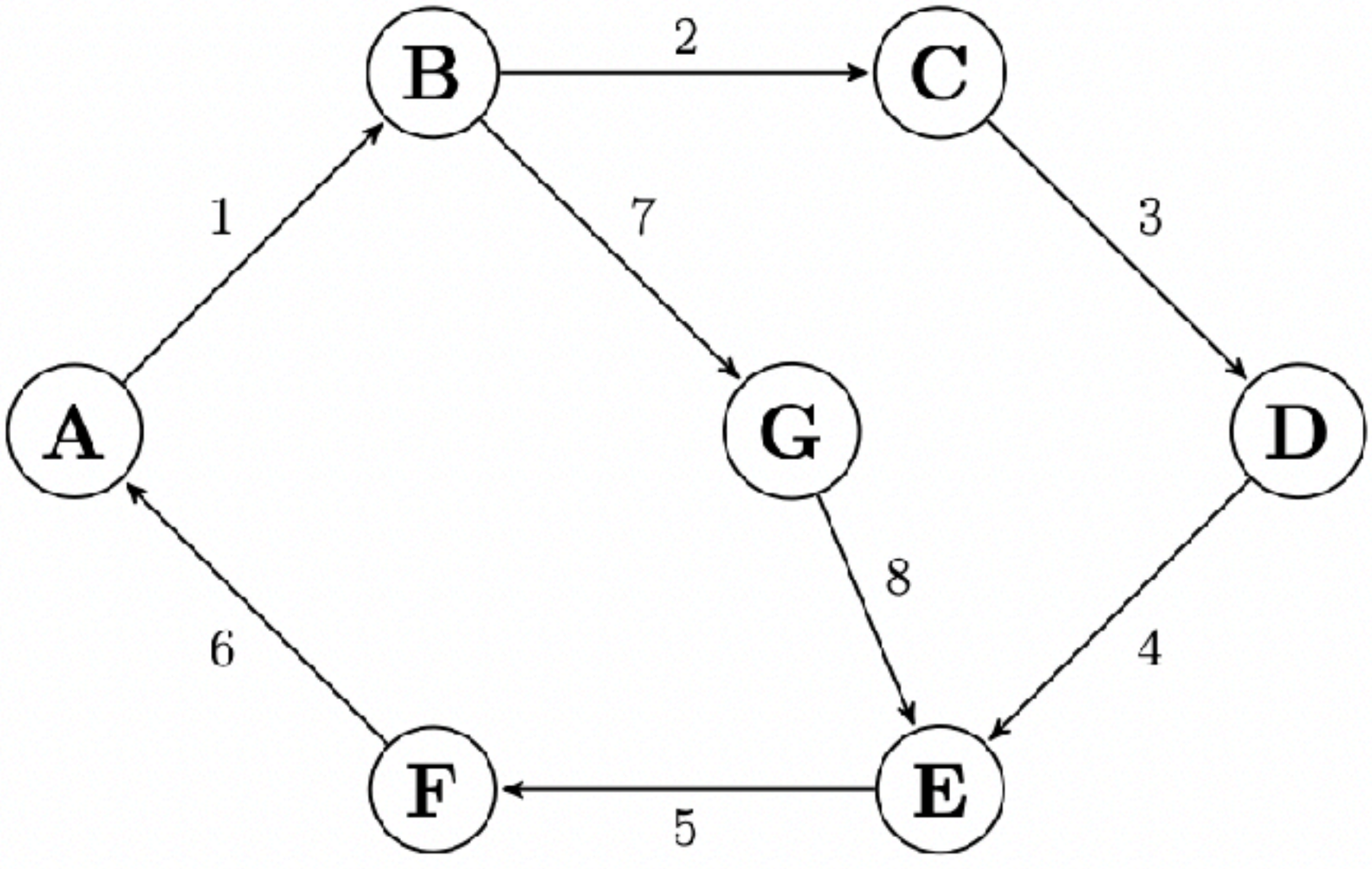
QUESTION 3

iv. In case of a systemic shock, which bank would be the most affected?

State your assumptions (if any) and justify your answer.

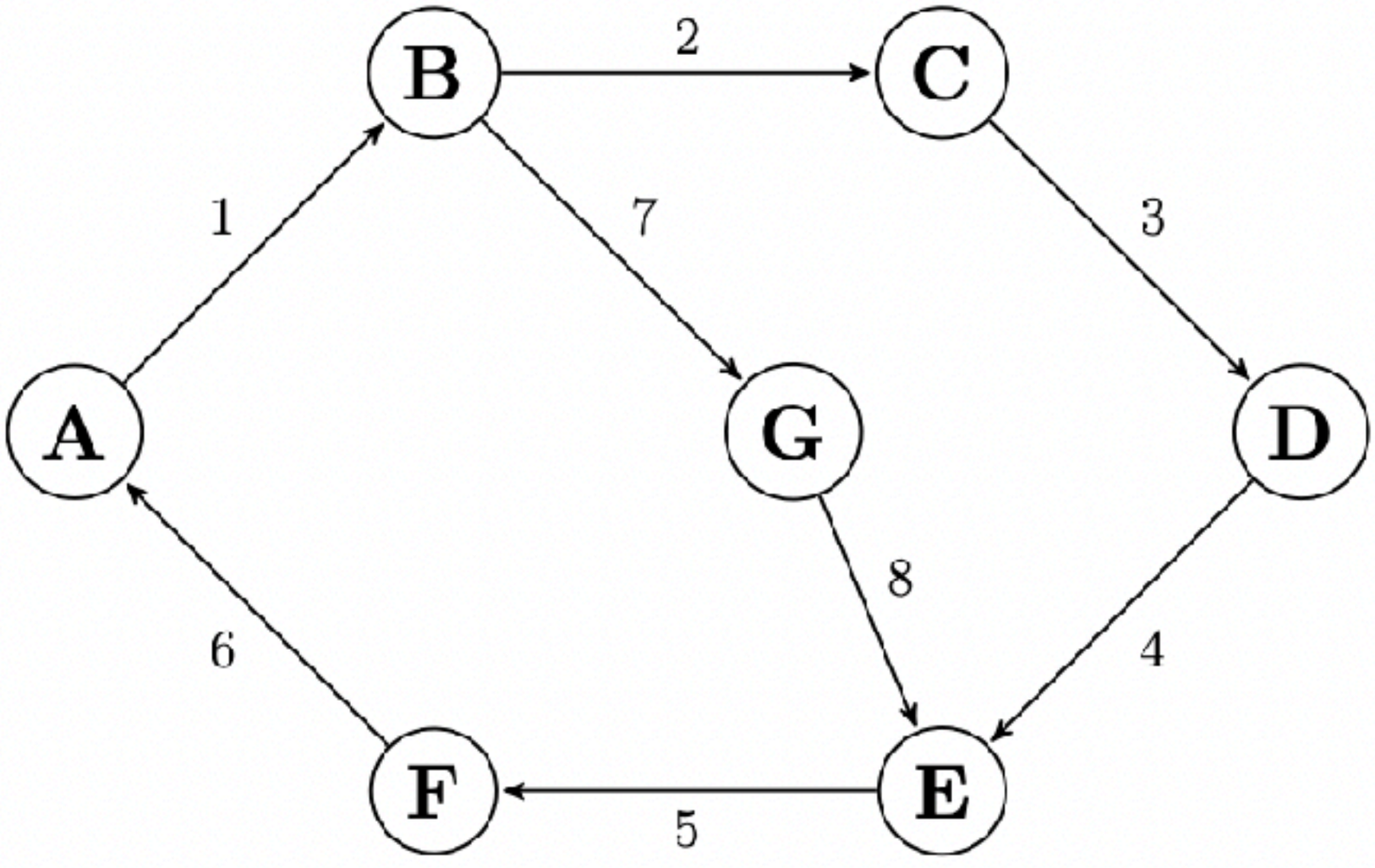
BONUS QUESTION (DIFFERENT EXAM)

Given the following directed, unweighted network



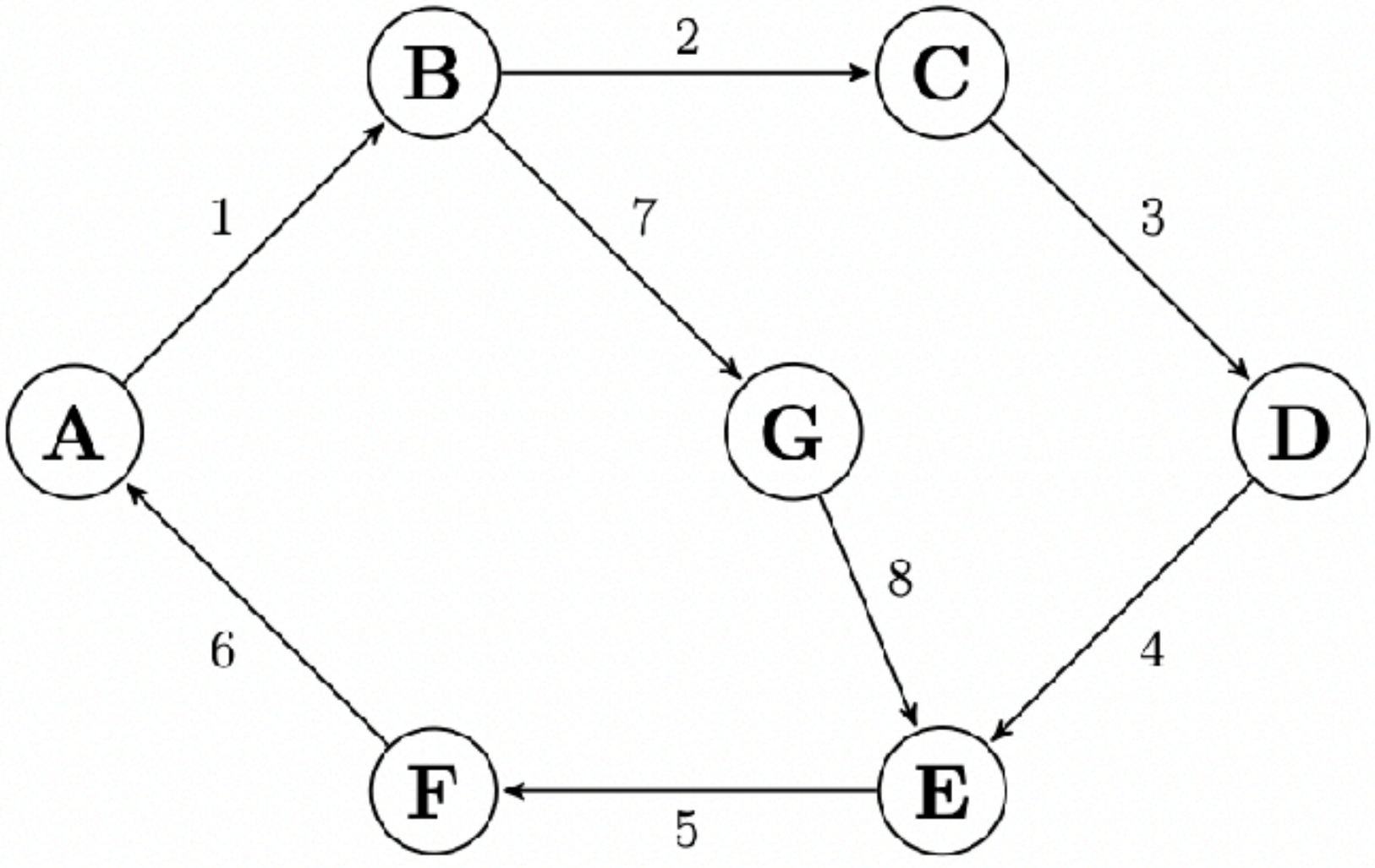
BONUS QUESTION (DIFFERENT EXAM)

i. If the weakly and strongly connected components exist, list the nodes that are part of them.



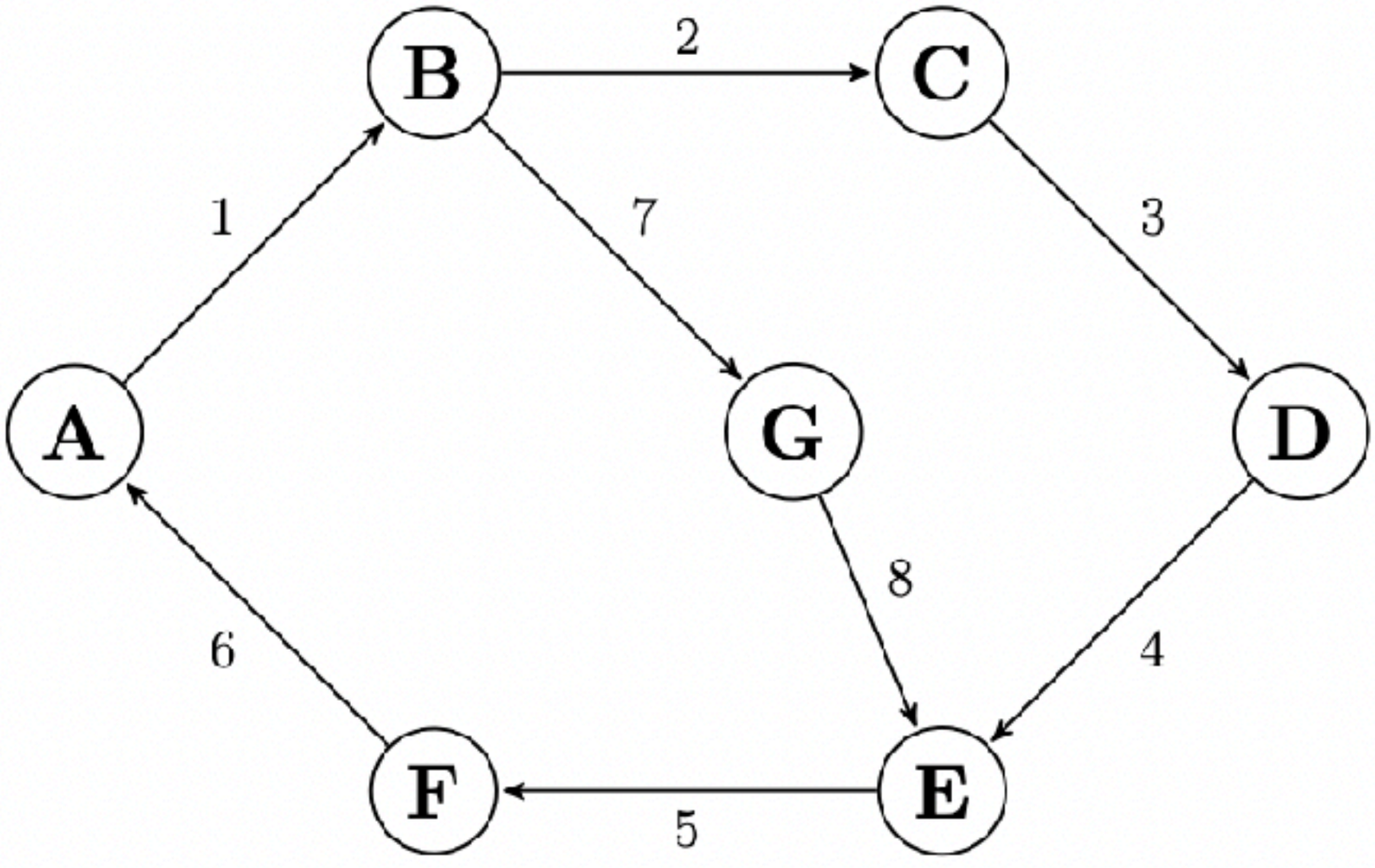
BONUS QUESTION (DIFFERENT EXAM)

ii. Which edge would be removed first by the Girvan-Newman algorithm?
Motivate your answer.



BONUS QUESTION (DIFFERENT EXAM)

iii. Discuss the robustness of the network (maximum five sentences).



BONUS QUESTION (DIFFERENT EXAM)

iv. Which is the least important node in the network? Motivate your answer.