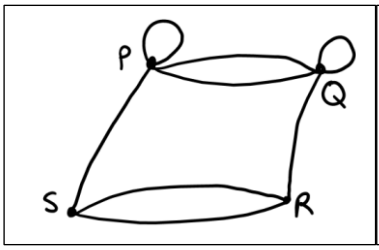
End of Chapter Revision: Networks and Graphs

Q1. Explain, by defining the terms, what the difference is between a path, a walk and a cycle.

Q2. If $A = \begin{pmatrix} -1 & 2 & 0 \\ 3 & 1 & -1 \\ 0 & 2 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & 0 & 1 \\ 1 & -2 & 0 \\ 4 & -3 & 2 \end{pmatrix}$ calculate BA.

Q3. Consider the network shown on the right.



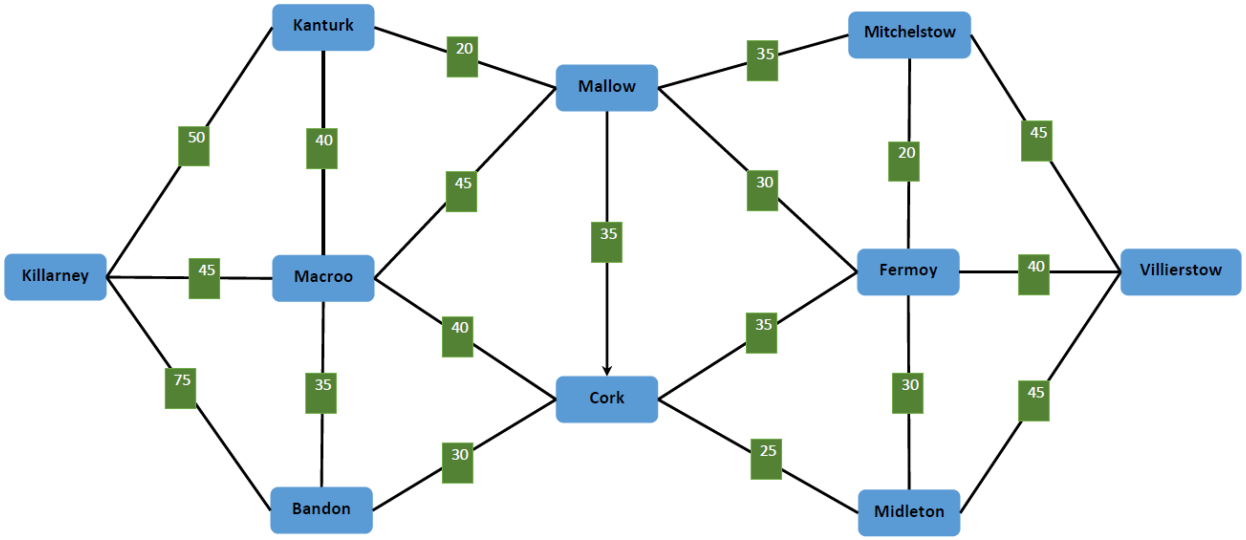
$\begin{pmatrix} 69 & 56 & 48 & 27 \\ 56 & 69 & 27 & 48 \\ 48 & 27 & 42 & 8 \\ 27 & 48 & 8 & 42 \end{pmatrix}$

i) Write down the adjacency matrix A for this graph.

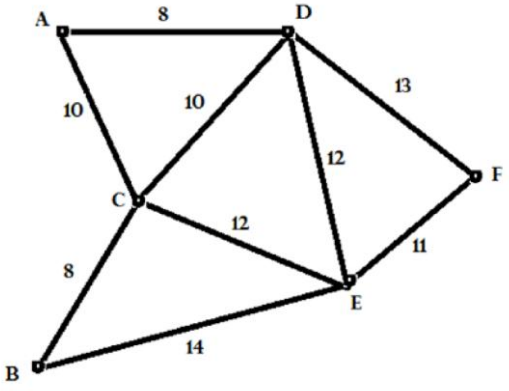
ii) The matrix A^4 is shown alongside the graph on the right. Write down how many walks of length 4 there are from R to S.

iii) Write down two of these walks.

Q4. Use Kruskal's Algorithm to find the minimum spanning tree for the network below and write down its weight. Draw your minimum spanning tree after.



Q5. Use Prim's Algorithm to find the minimum spanning tree for the network below and write down its weight. Draw your MST after.



Q6. i) Use Prim's algorithm to find the minimum spanning tree of the following network. ii) Draw the final MST and write down its combined weight.

	A	B	C	D	E
A	-	15	18	31	22
B	15	-	26	19	17
C	18	26	-	35	23
D	31	19	35	-	15
E	22	17	23	15	-