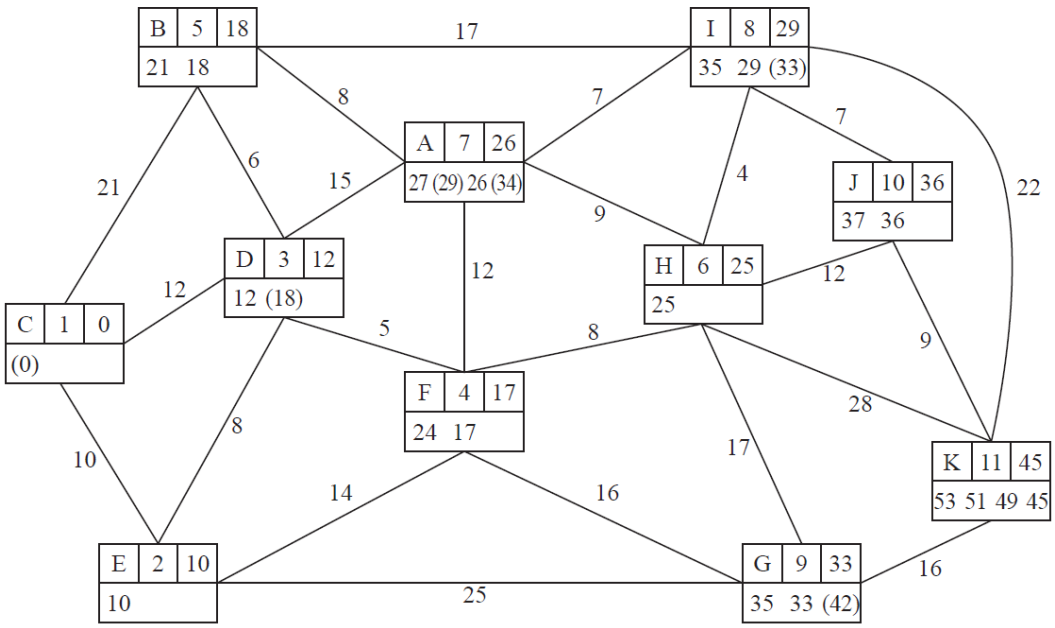
<table>
<tr><th>Question Number</th><th>Scheme</th><th>Marks</th></tr>
<tr><td>1.(a)</td><td>The list is not in (alphabetical) order</td><td>B1
(1)</td></tr>
<tr><td>(b)</td><td>
<table>
<tr><td>B</td><td>B</td><td></td><td></td></tr>
<tr><td>C</td><td>C</td><td></td><td></td></tr>
<tr><td>D</td><td>D</td><td></td><td></td></tr>
<tr><td>G</td><td>G</td><td>G</td><td>G</td></tr>
<tr><td>H</td><td>H</td><td>H</td><td></td></tr>
<tr><td>P</td><td></td><td></td><td></td></tr>
<tr><td>R</td><td></td><td></td><td></td></tr>
<tr><td>S</td><td></td><td></td><td></td></tr>
<tr><td>T</td><td></td><td></td><td></td></tr>
<tr><td>V</td><td></td><td></td><td></td></tr>
<tr><td>W</td><td></td><td></td><td></td></tr>
</table>
Football is not in the list</td><td>M1
A1
A1ft

A1
(4)</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td></td><td></td><td>5 marks</td></tr>
<tr><td></td><td>Notes for Question 1</td><td></td></tr>
<tr><td>a1B1</td><td>CAO - Accept alternatives such as “the list is not in ascending/descending order” or “The list is not ordered”, give BOD here.</td><td></td></tr>
<tr><td>b1M1</td><td>Orders list alphabetically (condone one slip) and correct choice of pivot
May be implied by selecting ‘6’ or ‘P’ or sight of $\frac{11+1}{2}$</td><td></td></tr>
<tr><td>b1A1</td><td>Discards P and above (or equivalent e.g. 6-11 discarded) and correctly chooses second pivot – if pivot not discarded then A0</td><td></td></tr>
<tr><td>b2A1ft</td><td>Discards their second pivot and below, if pivot chosen correctly for their list following their first discard, and correctly chooses third pivot – if pivot not discarded then A0. Must be discarding the correct ‘half’ of the list to locate F.</td><td></td></tr>
<tr><td>b3A1</td><td>CSO discards H and compares G with F concluding not in list</td><td></td></tr>
<tr><td colspan="3">Note: If they omit one item or add one item (e.g. F) they can score M1A0A0A0.

Note: If they refer to the position number throughout for a correctly ordered list this is acceptable and all marks are available.</td></tr>
</table>

Question Number	Scheme	Marks
2.(a)		M1 A1 (EDFB) A1 (HAIG) A1ft (JK)
	Quickest route from C to K is CDFHIJK	A1
	Quickest time is 45 (minutes)	A1ft
		6 Marks
	Notes for Question 2	
	In (a) it is important that all values at each node are checked very carefully – the order of the working values must be correct for the corresponding A mark to be awarded e.g. at F the working values must be 24 17 in that order (so 17 24 is incorrect) **It is also important that the order of labelling is checked carefully. The order of labelling must be a strictly increasing sequence – so 1, 2, 3, 3, 4, … will be penalised once (see notes below) but 1, 2, 3, 5, 6, … is fine. Errors in the final values and working values are penalised before errors in the order of labelling**	
a1M1	A larger value replaced by a smaller value at least twice in the working values at either A, G, I, J, K	
a1A1	All values at E, D, F and B correct and the working values in the correct order	
a2A1	All values at H, A, I and G correct and the working values in the correct order	
a3A1ft	All values in J and K correct on the follow through and the working values in the correct order. To follow through J check that the working values at J follow from the candidate's final values for the nodes that are directly attached to J (which are H and I (and K)). For example, **if** correct then the order of labelling of nodes H and I are 6 and 8 respectively so the working values at J should come from H and I in that order. The first working value at J should be their 37 (the Final value at H) + 12 (the weight of the arc HJ), the second working value at J should be their 29 (the Final value at I) + 7 (the weight of the arc IJ). Repeat the process for K (which will have working values from H, I, G and J with the order of these nodes determined by the candidate's order of labelling at H, I, G and J)	
a4A1	CAO	
a5A1ft	Follow through their final value at K **only** – if answer is 45 but the final value at K is not 45 then A0 (condone lack of minutes)	