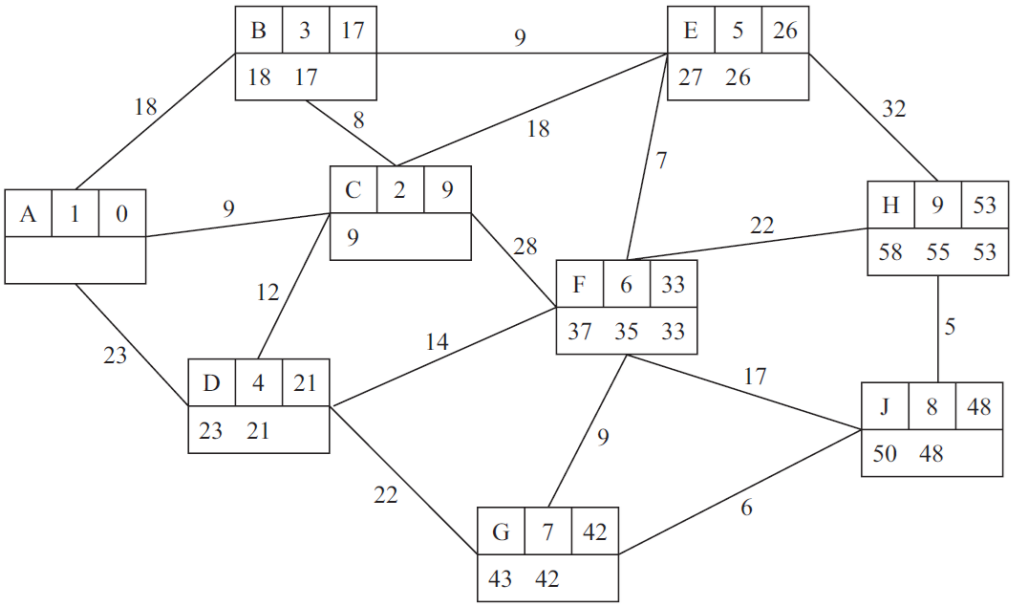
Question	Scheme	Marks
4. **(a)(i)**	 Fastest route: ACBEFGJH	**M1** **A1** (ACBD) **A1** (EFG) **A1ft** (JH) **A1**
(ii)	Fastest time: 53 (minutes)	**A1ft**
		(6)
(b)	Either calculates new fastest route AF(35) + FH(22) = 57 Or calculates the change to sections of the route e.g. ACDF compared with ACBEF and FGJH compared with FJH Difference 57 – "53" = 4 (minutes) or 2 + 2 = 4 (minutes)	**M1** **A1ft**
		(2)
		(8 marks)

Notes	
	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 E the working values must be 27 26 in that order (so 26 27 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**
ai1M1	A larger value replaced by a smaller value at least twice in the working values at either B, D, E, F, G, H, J
ai1A1	All values at A, C, B and D correct and the working values in the correct order
ai2A1	All values at E, F and G correct and the working values in the correct order
ai3A1ft	All values in J and H 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 F and G). For example, if correct then the order of labelling of nodes F and G are 6 and 7 respectively so the working values at J should come from F and G in that order. The first working value at J should be their 50 (the Final value at F) + 17 (the weight of the arc FJ), the second working value at J should be their 48 (the Final value at G) + G (the weight of the arc GJ). Repeat the process for H (which will have working values from E, F and J with the order of these nodes determined by the candidate's order of labelling at E, F and J)
ai4A1	CAO
aiiA1ft	Follow through their final value at H **only** – if answer is 53 but the final value at H is not 53 then A0 (condone lack of minutes)
bM1	Either calculates the revised time of 57 minutes Or compares the route in stages e.g. ACBEF against ACDF difference 2 and FGJH against FJH difference 2. If their final value at H is not 53 follow through their final value at F and shortest from F to H for these calculations
bA1ft	4 (minutes) (may be seen as 2 + 2 = 4) or follow through 57 - their fastest to H (which may be in sections AF + FH)