

# Pearson Edexcel AS Further Mathematics 8FM0

## Decision 1 – 4 Critical Path Analysis

Time allowed: 45 minutes

School: [www.CasperYC.club](http://www.CasperYC.club)

Name:

Teacher:

Question	Points	Score
1	9	
2	14	
3	7	
4	10	
Total:	40	

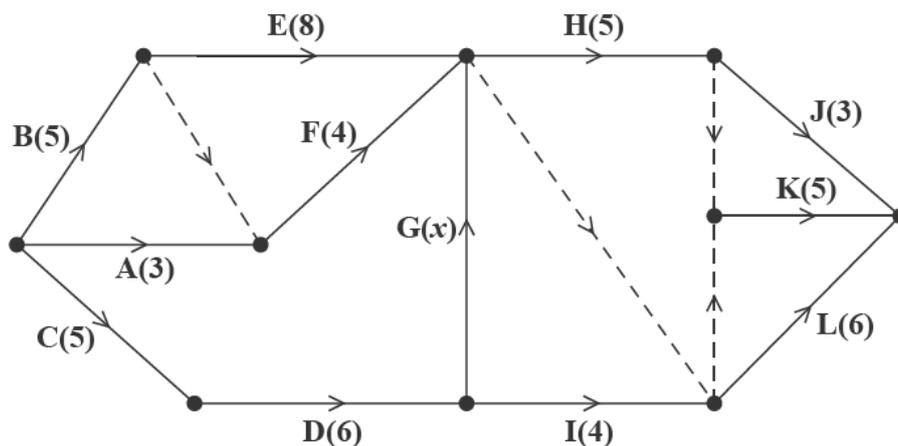
How I can achieve better:

- 
- 
- 

Last updated: February 3, 2026



1.



A project is modelled by the activity network shown in Figure above. The activities are represented by the arcs. The number in brackets on each arc gives the time, in days, to complete the corresponding activity. Each activity requires exactly one worker. The project is to be completed in the shortest possible time.

Before the project begins, the duration of activity  $G$ , in days, is unknown and is given by  $x$ , where  $x > 8$ .

(a) Complete Diagram 1 in the answer book to show the early event times and the late event times, in terms of  $x$  where necessary. [4]

(b) Identify the critical activities. [1]

The sum of the total float for activity  $A$  and the total float for activity  $E$  is equal to the minimum completion time of the project.

(c) Making your reasoning clear, determine the minimum completion time for the project. [4]

Total: 9

---

---

---

---

---

---

---

---

---

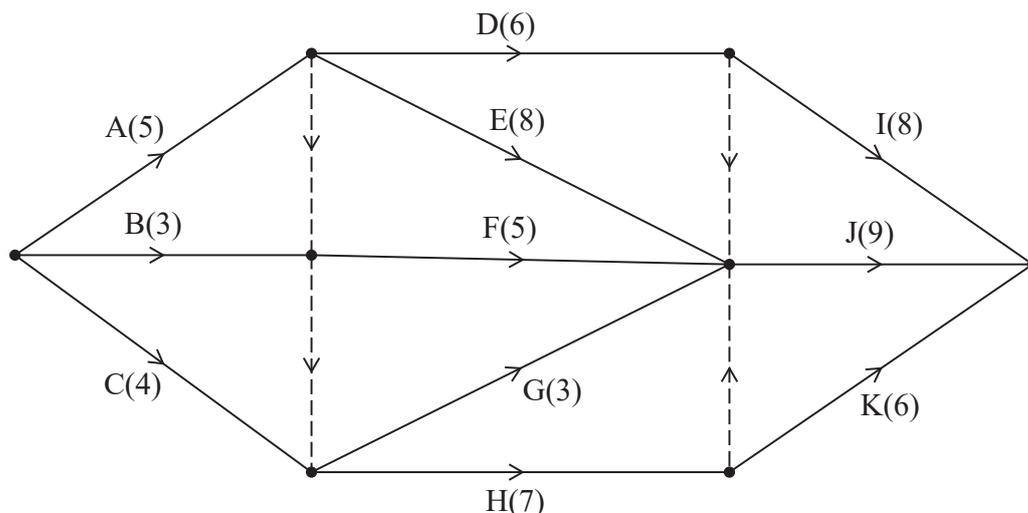
---





## 8FM0 Unit Test – Decision 1 – 4 Critical Path Analysis

2. A project is modelled by the activity network shown below.



The activities are represented by the arcs. The number in brackets on each arc gives the time, in hours, to complete the corresponding activity. Each activity requires one worker. The project is to be completed in the shortest possible time.

- (a) Complete the precedence table in the answer book. [2]
- (b) Complete Diagram 1 in the answer book to show the early event times and the late event times. [3]
- (c) i. State the minimum project completion time. [2]  
ii. List the critical activities.
- (d) Calculate the maximum number of hours by which activity H could be delayed without affecting the shortest possible completion time of the project. You must make the numbers used in your calculation clear. [1]
- (e) Calculate a lower bound for the number of workers needed to complete the project in the minimum time. You must show your working. [2]
- (f) Draw a cascade chart for this project on Grid 1 in the answer book. [3]
- (g) Using the answer to (f), explain why it is not possible to complete the project in the shortest possible time using the number of workers found in (e). [1]

Total: 14









## 8FM0 Unit Test – Decision 1 – 4 Critical Path Analysis

4. The table below shows the activities required for the completion of a building project. For each activity, the table shows the time it takes, in days, and the immediately preceding activities.

Activity	Time taken (days)	Immediately preceding activities
A	5	–
B	8	–
C	4	–
D	14	A
E	10	A
F	3	B, C, E
G	7	C
H	5	D, F, G
I	7	H
J	9	H

Each activity requires one worker. The project is to be completed in the shortest possible time.

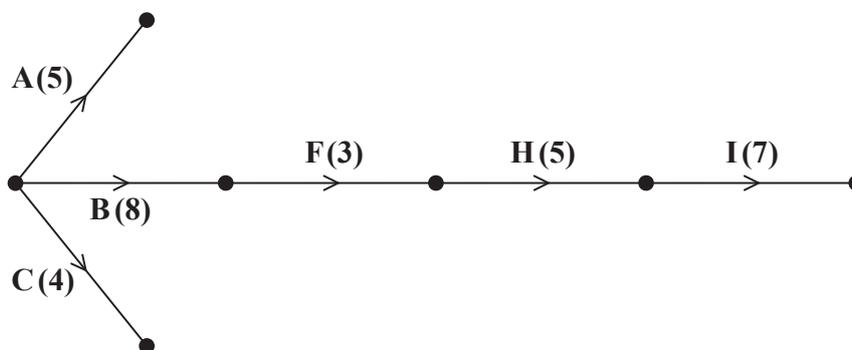


Figure above shows a partially completed activity network used to model the project. The activities are represented by the arcs and the number in brackets on each arc is the time taken, in days, to complete the corresponding activity.

- Add the missing activities and necessary dummies to Diagram 1 in the answer book. [3]
- Complete Diagram 1 in the answer book to show the early event times and the late event times. [3]
- State the critical activities. [1]

At the beginning of the project it is decided that activity **G** is no longer required.



