

Critical Path Analysis Overview (14/12/23)

Q1

(i) Draw an activity-on-arc (MEI/OCR/Edx) or activity-on-node (AQA) network to represent the following project, and establish the earliest and latest event times.

| Activity | Immediate predecessors | Duration |
|----------|------------------------|----------|
| A | - | 5 |
| B | - | 7 |
| C | B | 4 |
| D | B | 6 |
| E | D | 5 |
| F | A | 3 |
| G | F | 9 |
| H | A,C | 7 |
| I | E | 7 |
| J | F | 5 |
| K | D,G,H,I | 8 |
| L | D,G,H,I | 8 |
| M | E | 9 |
| N | J | 6 |
| O | L,M | 9 |
| P | O | 6 |

| | | |
|---|-------|---|
| Q | J,K,P | 4 |
| R | O | 7 |

(ii) State the critical path(s).

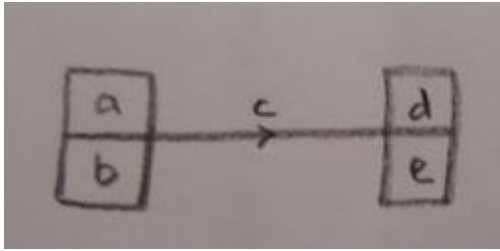
(iii) The duration of each activity can be reduced at a cost (with the amount of possible reduction varying by activity). If the project is to be completed as quickly as possible, describe how the required extra cost can be established.

Q2

Construct an activity network for the following part of a precedence table:

| | <i>depends on</i> |
|---|-------------------|
| A | - |
| B | - |
| C | - |
| D | A, B |
| E | A, C |

Q3



The diagram shows the earliest and latest event times relating to a particular activity, together with its duration.

(i) Create an example of a network to show that it is not necessary that $d \geq b$.

(ii) List the constraints that do apply.

Q4 Create an activity-on-arc network (with earliest and latest event times) for the following precedence table:

| Activity | Duration | Immediately preceding activities |
|----------|----------|----------------------------------|
| A | 1 | - |
| B | 2 | - |
| C | 1 | A |
| D | 1 | B |
| E | 4 | B |
| F | 2 | C,D |
| G | 3 | E,F |
| H | 2 | E |