

QQQ - Decision 1 - Chapter 8 - Critical Path Analysis (Version 2)

Total Marks: 22

(22 = Platinum, 20 = Gold, 18 = Silver, 15 = Bronze)

1.

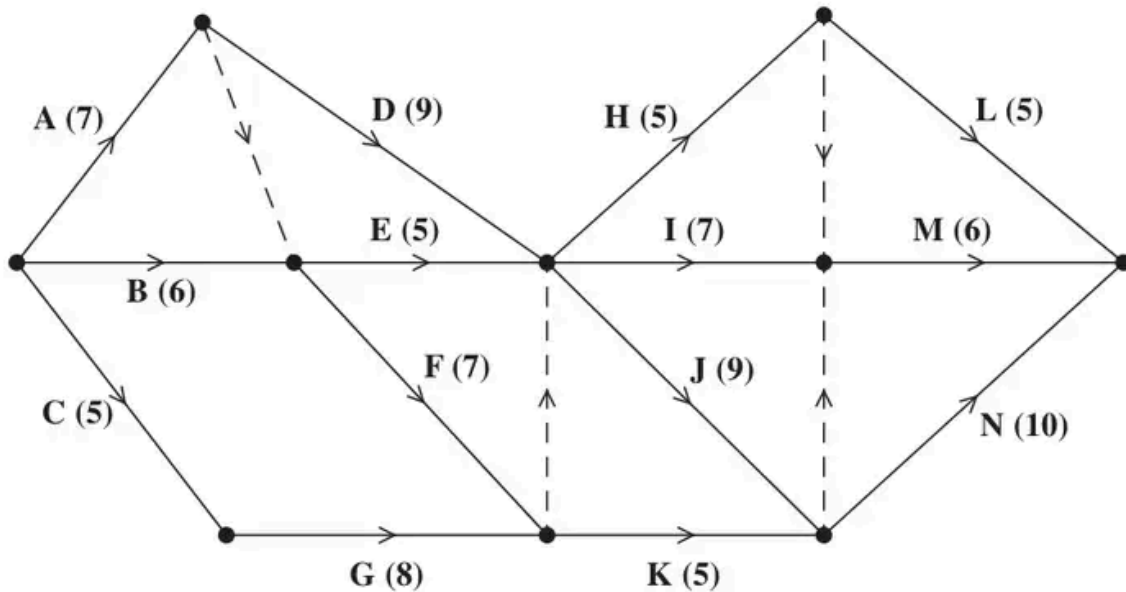


Figure 4

A project is modelled by the activity network shown in Figure 4. 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 one worker. The project is to be completed in the shortest possible time.

- (a) Complete Diagram 1 in the answer book to show the early event times and the late event times. (4)
- (b) State the critical activities. (1)
- (c) Draw a cascade (Gantt) chart for this project on the grid in the answer book. (4)
- (d) Use your cascade chart to determine the minimum number of workers needed to complete the project in the shortest possible time. You must make specific reference to times and activities. (You do **not** need to provide a schedule of the activities.) (2)

(Total 11 marks)

2. The precedence table below shows the 12 activities required to complete a project.

Activity	Immediately preceding activities
A	–
B	–
C	–
D	A
E	A, B, C
F	A, B, C
G	C
H	D, E
I	D, E
J	D, E
K	F, G, J
L	F, G

- (a) Draw the activity network described in the precedence table, using activity on arc.
Your activity network must contain the minimum number of dummies only. (5)

Each of the activities shown in the precedence table requires one worker. The project is to be completed in the minimum possible time.

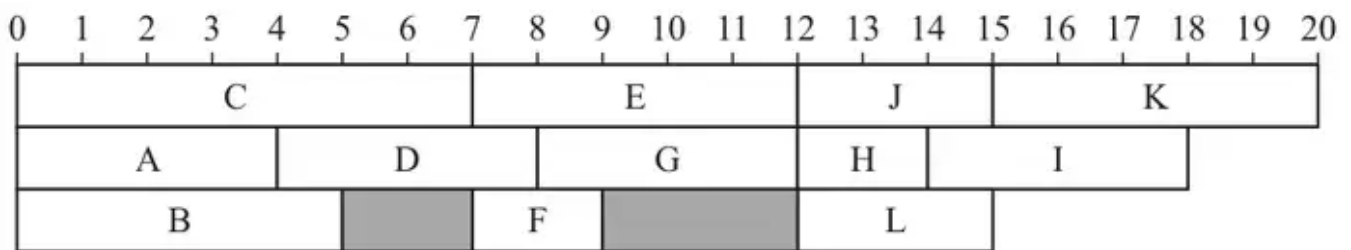


Figure 3

Figure 3 shows a schedule for the project using three workers.

- (b) (i) State the critical path for the network.
(ii) State the minimum completion time for the project.
(iii) Calculate the total float on activity B.

- (iv)** Calculate the total float on activity G. **(4)**

Immediately after the start of the project, it is found that the duration of activity I, as shown in Figure 3, is incorrect. In fact, activity I will take 8 hours.

The durations of all the other activities remain as shown in Figure 3.

- (c)** Determine whether the project can still be completed in the minimum completion time using only three workers when the duration of activity I is 8 hours.

Your answer must make specific reference to workers, times and activities. **(2)**

(Total 11 marks)