5.

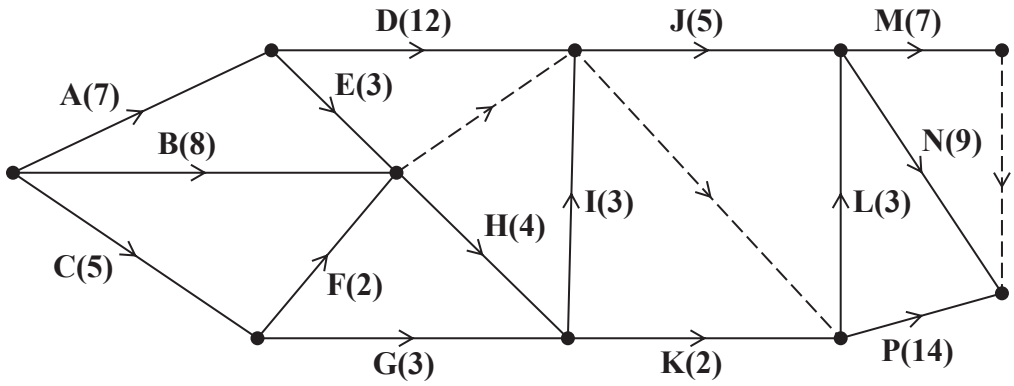


Figure 1

A project is modelled by the activity network shown in Figure 1. 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.

(a) Complete Diagram 1 in the answer book to show the early event times and the late event times.

(4)

(b) Calculate a lower bound for the number of workers needed to complete the project in the minimum time. You must show your working.

(2)

(c) Schedule the activities on Grid 1 in the answer book using the minimum number of workers so that the project is completed in the minimum time.

(4)

Additional resources become available, which can shorten the duration of one of activities D, G or P by one day.

(d) Determine which of these three activities should be shortened to allow the project to be completed in the minimum time. You must give reasons for your answer.

(2)

(Total 12 marks)