

Critical Path Analysis - Exercises (Sol'ns) (6 pages; 23/1/20)

(1***) (i) [Edx, OCR & MEI] Draw an activity-on-arc network to represent the following project, and establish the earliest and latest event times.

[AQA] Draw an activity-on-node network to represent the following project, and establish the earliest start and latest finish 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

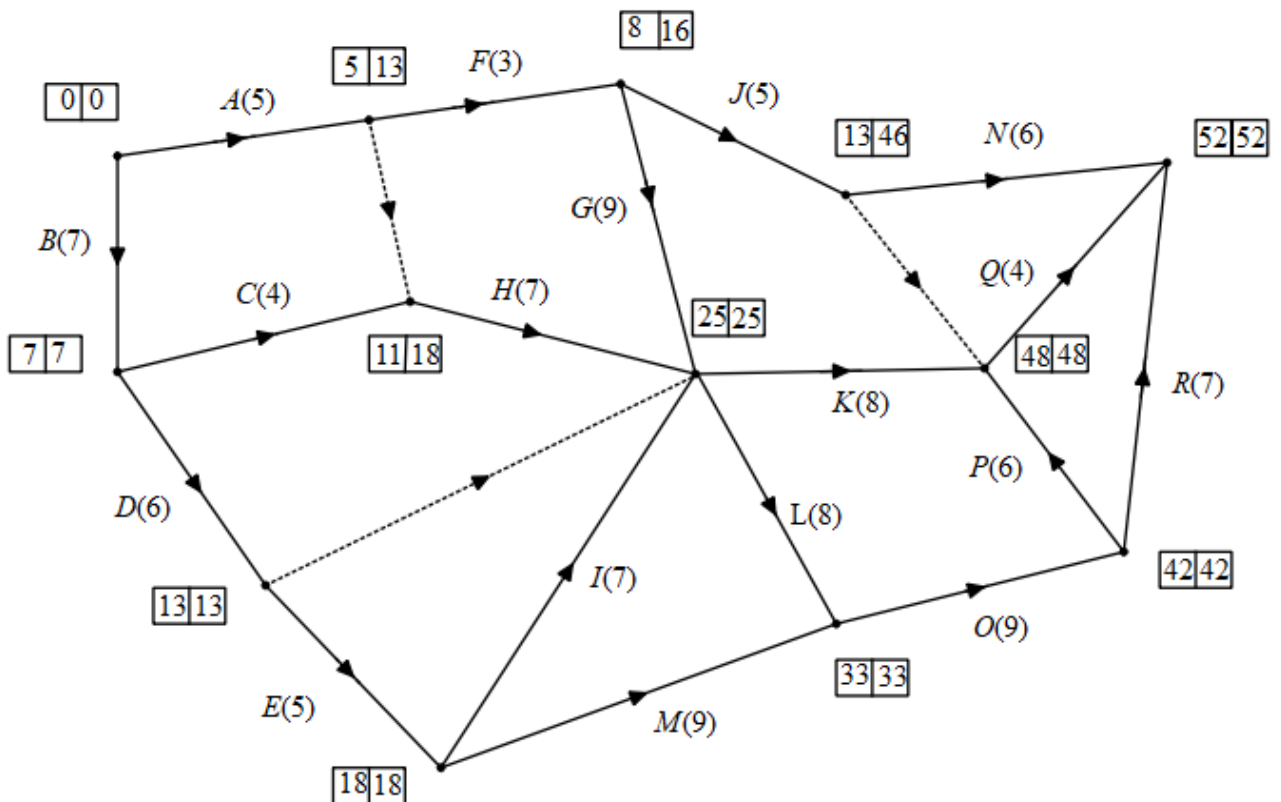
Q	J,K,P	4
R	O	7

(ii) State the critical path(s).

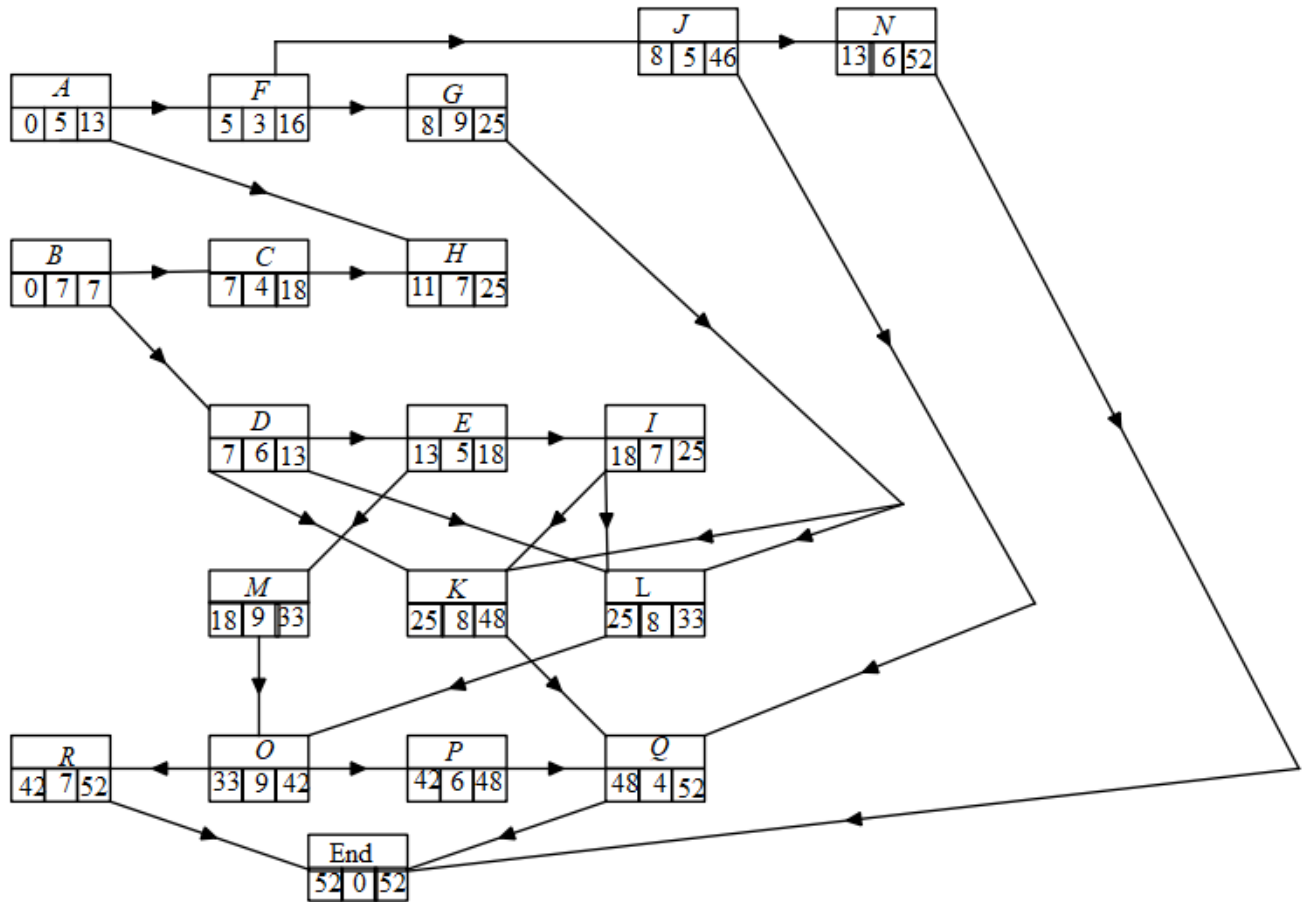
(iii) The duration of each activity can be reduced at a cost (with the amount of possible reduction varying by activity). If the project is to be completed as quickly as possible, describe how the required extra cost can be established.

Solution

(i) [Edx/OCR/MEI]



[AQA]



(ii) Minimum completion time is 52.

Critical path is BDEILOPQ

(iii) Create the network based on the minimum durations, and then increase the durations as far as possible for the non-critical activities.

(2***) [Some precedents may not be apparent from the Cascade chart, as can be seen from the following exercise.]

(i) Construct the activity network for the following precedence table:

A(5) -

B(20) -

C(10) A,B

D(20) B

E(5) C

F(25) D,E

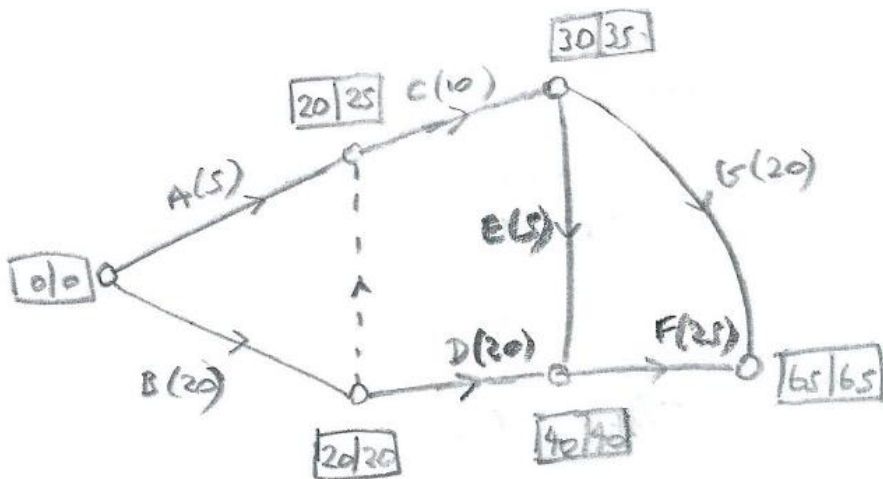
G(20) C

(ii) Construct a Cascade chart

(iii) Find the completion time if the duration of C is now 30

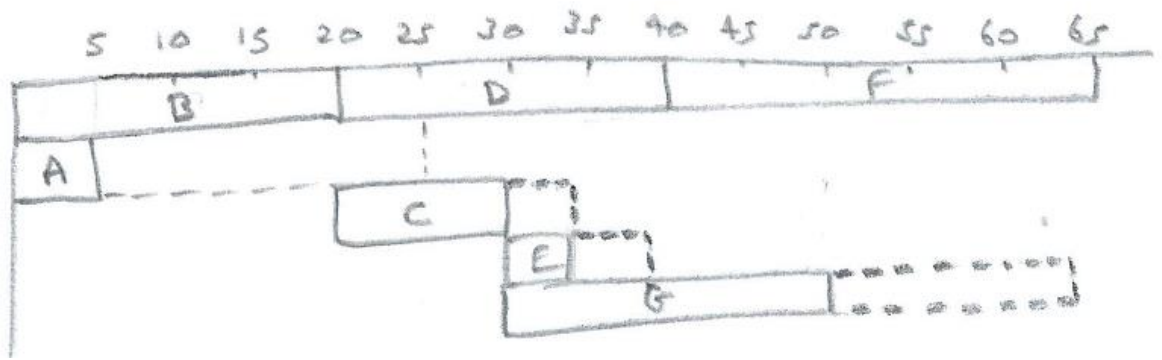
Solution

(i)



critical activities: BDF

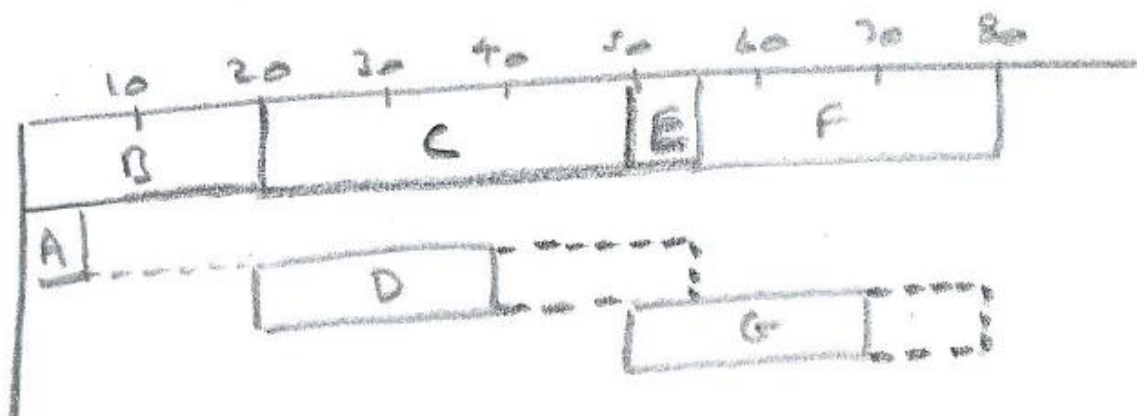
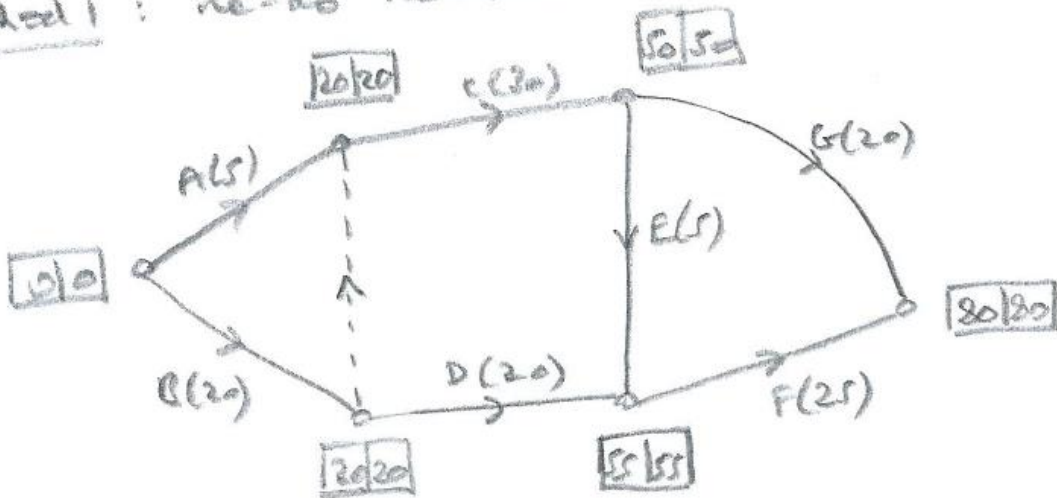
(ii)



Note: A has to be before C; C has to be before E; C has to be before G

(iii)

Network 1 : re-do network



Method 2 (just considering precedence)

