

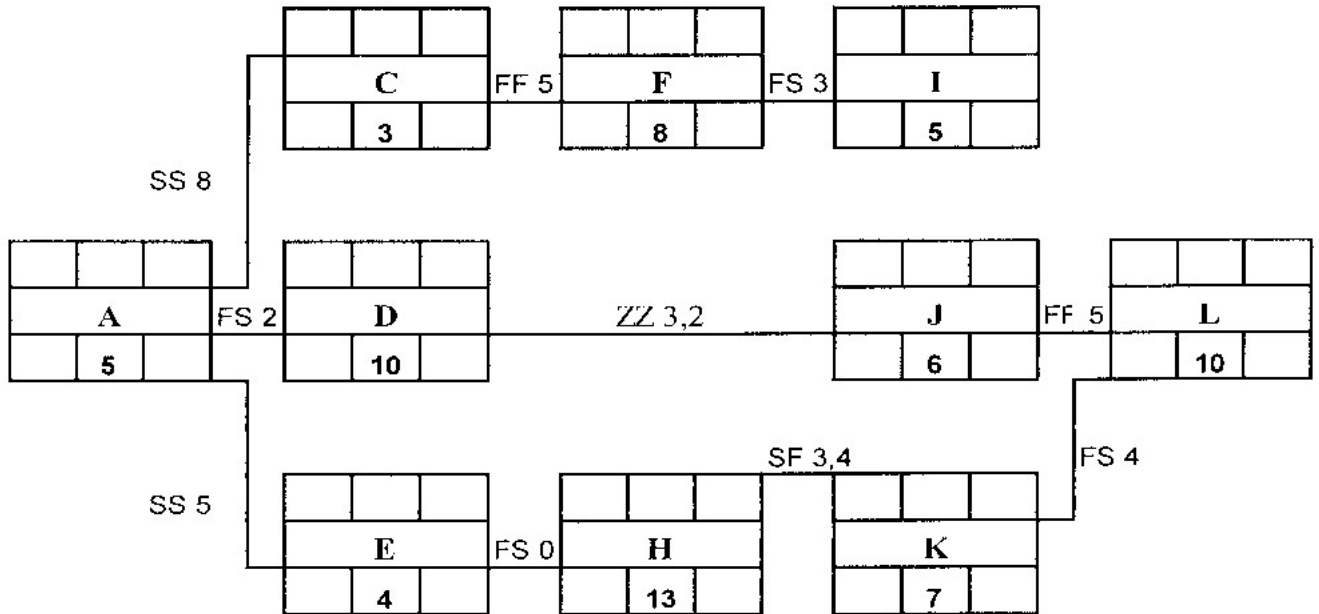
Question 1:

Draw the Activity –on- Node diagram (A-O-N) then compute the early /late start/finish time for each activity diagram.

Activity	Predece.	Duration	Activity	Predece.	Duration
A	-	6	F	C	6
B	A	3	G	D,F	7
C	A	10	H	F	9
D	B,C	4	I	G	8
E	B	8	J	H	6

Question No. 2 (25% of max. credit)

Given the precedence network for a small engineering project with activity durations in working days, it is required to compute the activity times (ES, EF, LS, and LF) and total floats (TF) and then indicate the critical activities. The equations shown below the network can be used.



$$[1] ES_j = \text{MAX}_{\text{all } i} \left\{ \begin{array}{l} \text{Initial Time} \\ EF_i + FS_{ij} \\ ES_i + SS_{ij} \\ EF_i + FF_{ij} - D_j \\ ES_i + SF_{ij} - D_j \end{array} \right\}$$

$$[2] EF_j = ES_j + D_j$$

$$[3] LF_i = \text{MIN}_{\text{all } j} \left\{ \begin{array}{l} \text{Terminal Time} \\ LS_j - FS_{ij} \\ LF_j - FF_{ij} \\ LS_j - SS_{ij} + D_i \\ LF_j - SF_{ij} + D_i \end{array} \right\}$$

$$[4] LS_i = LF_i - D_i$$

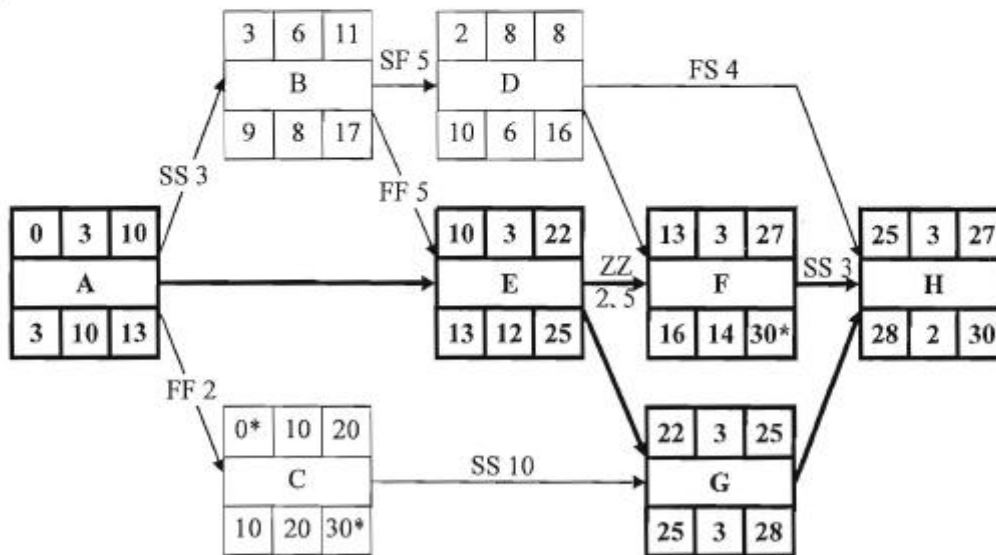
Question 3 (25%)

Consider the precedence diagram network shown below, with activity durations noted inside of each node. Find out the following:

- Compute the Early/Late start/finish times and Total Float for each activity where the initial time for the project is zero, and the terminal time for the project completion is 30.
- Write down the Critical Path (s).

$$ES_j = \text{Max}_{\text{all } i} \begin{cases} \text{Initial Time} \\ EF_i + FS_{ij} \\ ES_i + SS_{ij} \\ EF_i + FF_{ij} - D_j \\ ES_i + SF_{ij} - D_j \end{cases} \quad LF_i = \text{Min}_{\text{all } j} \begin{cases} \text{Terminal Time} \\ LS_j - FS_{ij} \\ LF_j - FF_{ij} \\ LS_j - SS_{ij} + D_i \\ LF_j - SF_{ij} + D_i \end{cases}$$

a)



b) Critical Path 1 is A-E-F, and Critical Path 2 is A-E-G-H

رقم الشعبة :

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Question 1 (50% of max. credit)

Analyse the shown AON network. Determine degree of criticality of the network paths.

Path	TF	Criticality
14-60-90-150-170-180-200	0	1
10-30	1	2
50-80-140-160	2	3
20	3	4
40-70-100-110-155-190	4	5
40-70-100-120-155-190	4	5
16	7	6

