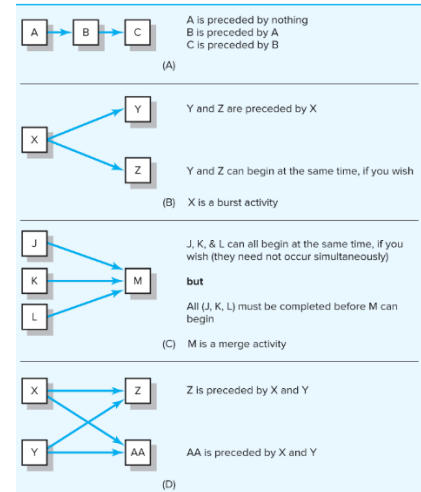


- 8 – when there are multiple starts, a common start node can be used to indicate the beginning of a project on a network. Similarly, single project end node can be used to indicate clear ending

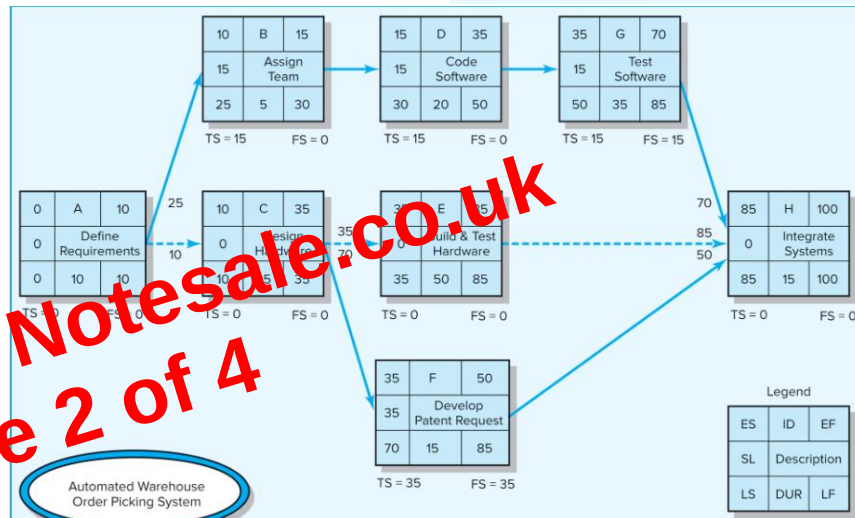
Activity-On-Node (AON) Fundamentals

- 2 methods used to develop project networks
 - AON – Activity-on-node (activity is shown on node/rectangle)
 - 3 basic relationships for activities
 - Predecessor activities - before
 - Successor activities - after
 - Concurrent/parallel activities - during
 - AOA – Activity-on-arrow (activity is shown on arrow)



Network Computation Process

- Forward pass – earliest times
 - Early start (ES) = largest EF of predecessors
 - Early finish (EF) = ES + DUR
 - Expected time (TE)
- Backward pass – Latest times
 - Late start – LS = LF - DUR
 - Late finish – LF = smallest LS of successors
 - Critical Path – CP
 - Slack/Float – SL = LS - ES
- Total slack – time an activity can be delayed without affecting project duration
 - $TS = LS - ES$
 - $TS = LF - EF$
 - Negative slack is when critical path is delayed
- Sensitivity – function of number of critical paths or near-critical paths
 - Insensitive - network schedule has 1 CP and noncritical activities with significant slack
 - Sensitive – 1+ CP and noncritical activities with very little slack
- Free Slack/Float (FS) – max time activity can be delayed from ES without affecting ES of any successor(s)
 - Can never be negative
 - Only activities at end of chain (merge activities) can have free slack



Practical Considerations

- Activity numbering
 - Activities can have gaps between their ID numbers to add missing/new activities later
- Gantt charts are used during planning, resource scheduling and status reporting
 - Extended lines from bars represent slack
 - Bar indicates ES, EF, LF, slack