

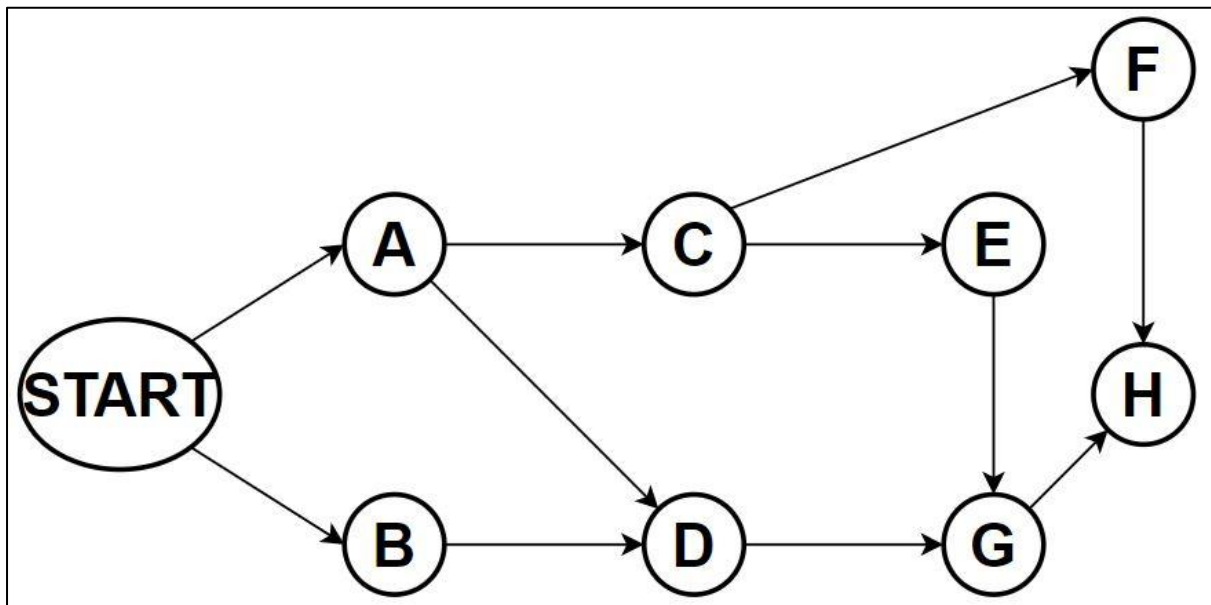
## Assignment No.: 3

1. Draw activity on node and activity on arrow diagram based on following activities of a project and their interrelationships shown in following table.

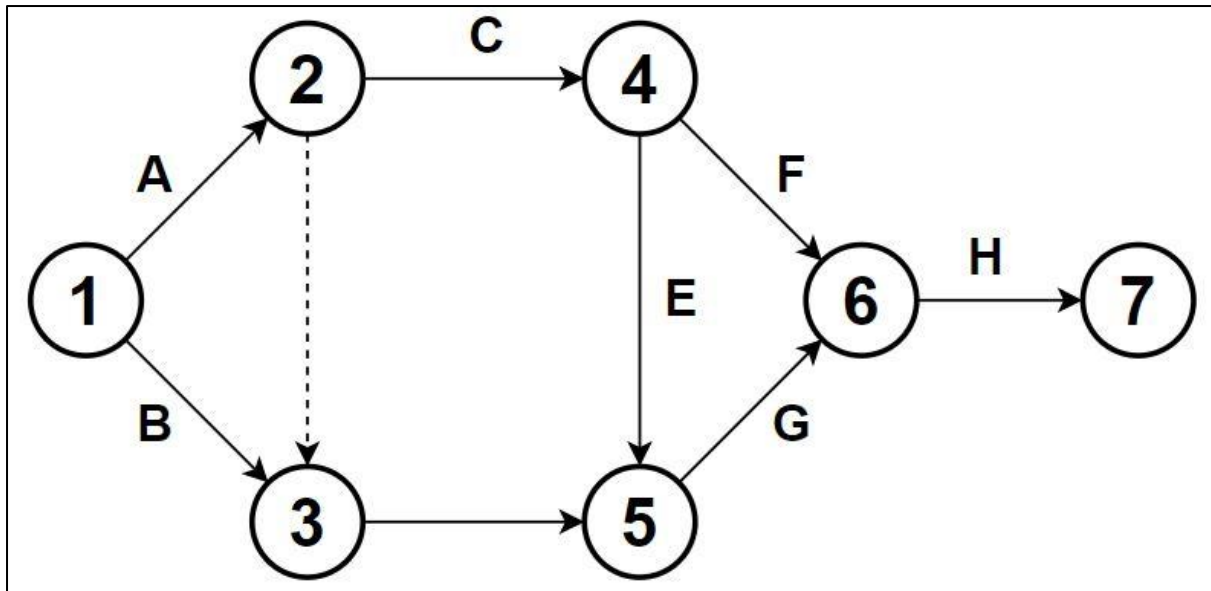
Activity	Predecessor Activity
A	-
B	-
C	A
D	A,B
E	C
F	C
G	D,E
H	F,G

**Solution:**

- ACTIVITY ON NODE-



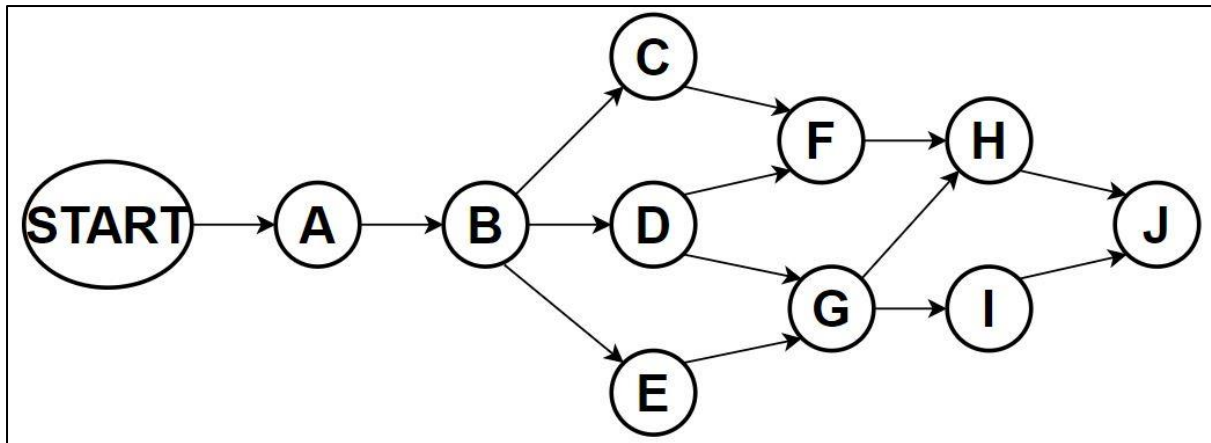
- ACTIVITY ON ARROW-



2. A project manager and team came up with the estimates as presented in table 1.1. Draw an activity on node diagram based on predecessors given, calculate expected duration for each activity and calculate and find the critical path.

Activity	Predecessors	Optimistic estimates (days) a	Most likely estimates (days) b	Pessimistic estimates (days) c
A	None	1	2	4
B	A	3	5	8
C	B	2	4	5
D	B	2	3	6
E	B	1	1	1
F	C,D	2	4	6
G	D,E	2	3	4
H	F,G	1	2	5
I	G	4	5	9
J	H,I	0.5	1	3

- ACTIVITY ON NODE-



- Calculating Critical path:

Activity	Optimistic time estimate ( $t_0$ )	4 X most likely time estimate ( $t_m$ )	Pessimistic time estimate ( $t_p$ )	$t_0 + 4t_m + t_p$	Time estimate $t_e = (t_0 + 4t_m + t_p)/6$
A	1	2	4	13	2.2
B	3	5	8	31	5.2
C	2	4	5	23	3.8
D	2	3	6	20	3.33
E	1	1	1	6	1
F	2	4	6	24	4
G	2	3	4	18	3
H	1	2	5	14	2.33
I	4	5	9	33	5.5
J	0.5	1	3	7.5	1.3

Possible paths are-

- A – B – C – F – H – J  
 $2.2+5.2+3.8+4+2.3+1.3 = 18.8$
- A – B – D – F – H – J  
 $2.2+5.2+3.3+4+2.3+1.3 = 18.3$
- A – B – D – G – H – J  
 $2.2+5.2+3.3+3+2.3+1.3 = 18.6$
- A – B – D – G – I – J  
 $2.2+5.2+3.3+3+5.5+1.3 = 20.5$
- A – B – E – G – I – J  
 $2.2+5.2+1+3+5.5+1.3 = 18.2$

- A – B – E – G – H – J  
 $2.2+5.2+1+3+2.3+1.3 = 15$

Since, the longest path is,

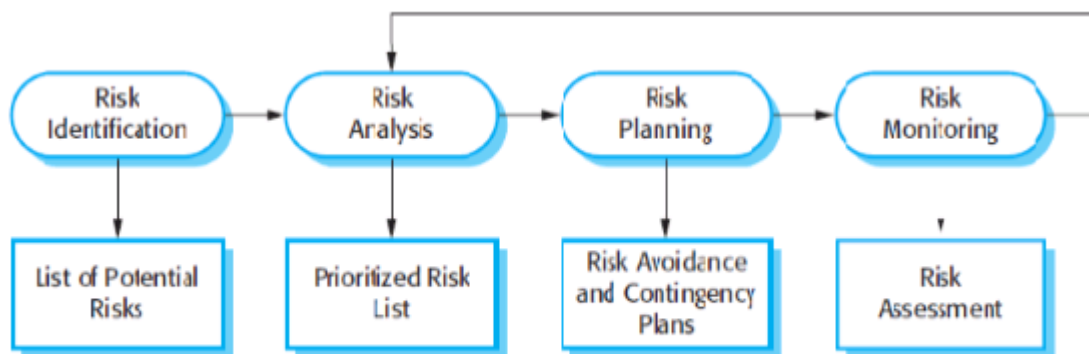
- A – B – D – G – I – J  
 $2.2+5.2+3.3+3+5.5+1.3 = 20.5$

It is the **critical path**.

### 3. Explain risk management process. Also, identify any two risks associated with software project RMMM for the same.

**Ans. Risk management**

- Risk management is one of the most important jobs for a project manager.
- Risk management involves anticipating risk that might affect the project schedule or the quality of the software being developed, and then taking action to avoid these risks.
- Risk is something that prefer not to happen. Risks may threaten the project, the software that is being developed, or the organization.
- The outline of the process of risk management is illustrated in following fig.1



**Fig 1. Risk management process**

- Risk management involves following several stages
  1. Risks identification Risk identification can be done by identifying the known and predictable risk.
  2. Risk analysis Risk can be analyse by assessing consequences of problem associated with risk.
  3. Risk planning Making plan to address the risk, either by avoiding it or minimizing its effect on the project.
- Risk monitoring regularly assessing the risk and plans for risk mitigation.
- The risk management process is an iterative process that continues throughout the project. Once initial risk management plan is drawn up, it will help to monitor the situation to detect the emerging risks. As more information about the risks become available, then it will be easier to analyse

and decide if the risk priority has changed. Referring it you may then have to change your plans for risk avoidance and contingency management.

### **1. Risk Identification**

- Risk identification is the first stage of the risk management process.
- It is concerned with identifying the risks that could pose a major threat to the software engineering process, the software being developed, or the development organization.
- Risk identification is done by team or sometimes by the project manager.
- The risk item can be identified using following and predictable components.
- After preparing a risk item checklist, a questionnaire is prepared. These set of question should be answered and based on these answer the impact or seriousness of particular risk item can be judged.
- The set of risk components and drivers list is prepared along with their probability of occurrence. Then their impact on the project can be analysed.

### **2. Risk Analysis**

- There are two way by which risk can be rated
  1. Probability of the risk is real
  2. Consequences of problems associated with the risk
- The project planner, technical staff, project manager perform following steps to perform for risk analysis
  - Establish a scale that indicates the probability of risk being real.
  - Enlist the consequences of the risk.
  - Estimate the impact of the risk on the project and product.
  - Maintain the overall accuracy of the risk projection in order to have clear understanding of the software that is to be built.
  - This steps helps to prioritize the risk. And finally, risk table will be built.

### **3. Risk planning**

- The risk planning process considers each of the key risks that have been identified, and develop strategies to manage these risks.
- For each risks, they have to think of actions that they might take to minimize the disruption to the project if the problem identified in the risk occurs.
- There is no simple process that can be followed for contingency planning. It relies on the judgment and experience of the project manager.
- Possible risk management strategies fall into three categories.

#### **1. Avoidance strategies**

Using these strategies mean that the probability that the risk will be arise will be reduced. Example of a risk avoidance strategy is the strategy dealing with defective components.

## **2. Minimization strategies**

Using these strategies means that the impact of the risk will be reduced. Example of risk minimization strategy is the strategy for staff illness (recognize team so they can understand each other's job).

## **3. Contingency strategies**

Using these strategies means that team are prepared for the worst and have a strategy in place to deal with it. Example of contingency strategy is the strategy for organizational financial problem

- Finally, team should have strategies in place to cope with the risk if it arises. These should reduce the overall impact of a risk on the project or product.

## **4. Risk monitoring**

- Risk monitoring is the process of checking that your assumptions about the product, process and business risk have not changed.
- The objective of risk monitoring is
- To check whether the predicted risks really occur or not.
- To ensure the step defined to avoid the risk are applied properly or not.
- To gather the information which can be useful for analysing the risk.

Finally, RMMM document is created, in which all the risk analysis activities are described. Sometimes project manager includes this document as a part of overall project plan.

### **Risks associated with delayed Project are**

- Customer will not satisfy with the service provided by service provider.
- Project development cost will be increases due to maximum resources are used for completion of the project.
- There might be chances of new requirement from customer because of delay in project delivery.

### **THE RMMM PLAN**

Risk Mitigation, Monitoring and Management Plan (RMMM) – documents all work performed as part of risk analysis and is used by the project manager as part of the overall project plan. RIS is maintained using a database system, so that creation and information entry, priority ordering, searches, and other analysis may be accomplished easily. Risk monitoring is a project tracking activity

### **Three primary objectives:**

- Assess whether predicted risks do, in fact, occur
- Ensure that risk aversion steps defined for the risk are being properly applied
- Collect information that can be used for future risk analysis.