PT1-Solution IT206G Even-2022

Q1 a)

Software is

- Instruction (computer program) that when executed provide desired feature, function and performance .
- Data structures that enable the programs to adequately manipulate information and..
- Descriptive information(documents) in both hardcopy and virtual forms that describes the operation and use of the program. E. g. requirements, analysis & design documents, walk-through minutes, test plan, user manuals, etc

Software Engineering

"The application of a systematic, disciplined, quantifiable approach to the development, operation and maintenance of software; that is the application of engineering to software." (IEEE 1993)

Q1 b) generic process framework

- COMMUNICATION
- PLANNING
- MODELING
- CONSTRUCTION
- DEPLOYMENT

Q1 c)

Critical path is the sequence of activities between a project's start and finish that takes the longest time to complete.

i.e longest path through the entire network.

Q1 d)

1. People
2. Product
3. Process
4. Project

Q1 e) any two communication principles

Principle 1:Listen •Focus on speakers word, rather than formulating your response. •Ask for clarification if something is unclear but avoid constant interruption. •Never become

contentious(tending to show disagreement) in your words or action(rolling your eyes or shaking your head) as person is talking.

Principle 2:Prepare before you communicate •Understand the problem befor you meet. •Do some research to understand business domain jargon(terminology). •Prepare agenda in advance if u conduct the meeting.

Principle 3: Someone should facilitate the activity

Principle 4: Face to face communication is best Use representation of relevant information or drawing.

Principle 5: Take notes and document decisions Someone should record or note down all the points and decisions.

Principle 6: Strive for collaboration Collaboration

Principle 7: Stay focused,modularize your discussion.

Principle 8: If something is unclear,draw a picture

Principle 9: a)Once you agree to something,move on b)If you cant agree to something,move on c)If a feature or function is unclear and cannot be clarified at the moment,move on

Principle 10: Negotiation is not a contest or game.It works best when both parties win

Q1 f)

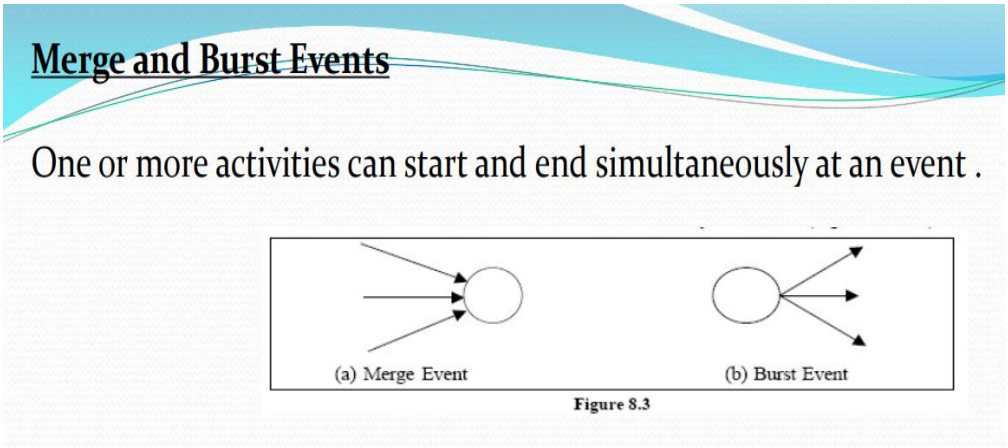


Figure 8.3

Q1 g)Any two

W5HH	The Question	What It Means
Why?	Why is the system being developed?	This focuses a team on the business reasons for developing the software.
What?	What will be done?	This is the guiding principle in determining the tasks that need to be completed.
When?	When will it be completed?	This includes important milestones and the timeline for the project.

Who?	Who is responsible for each function?	This is where you determine which team member takes on which responsibilities. You may also identify external stakeholders with a claim in the project.
Where?	Where are they organizationally located?	This step gives you time to determine what other stakeholders have a role in the project and where they are found.
How?	How will the job be done technically and managerially?	In this step, a strategy for developing the software and managing the project is concluded upon.
How Much?	How much of each resource is needed?	The goal of this step is to figure out the amount of resources necessary to complete the project.

Q2 a) Any three points

Factor	Waterfall Model	RAD Model
Name	Waterfall model is also called as the Classical or Traditional Model.	RAD Model, Rapid Development Model, is also known as the Iterative Model.
Risk	Waterfall model is a high risk model for software development.	RAD model is a low risk model for software development.
Aim	The aim of waterfall model is to develop software of high assurance.	The aim of RAD model is to develop software rapidly.
Waiting time	In waterfall model, the waiting time for running the application is long.	In RAD model, the waiting time for running software is less.
Team Size	Waterfall model requires large team to start software development.	In RAD model, team size can be increased or decreased as the development progresses.
Changes	Any changes to be done should in the earlier phases of development otherwise, it is very costly to fix.	Changes can be done in any phase.
Product Delivery	Water fall model delivers product in the end of the software development cycle.	RAD model gives earlier deliveries and seeks feedback to update the software as needed.
Waiting Time	A running or ready software is available at the end stage of development.	A running or ready software is available as soon as first iteration is complete.
Customer control	In waterfall model, the customer control over the administration is less.	In RAD model, the customer control over the administration is relatively more.

Q2 b) Any three with description. core principles of software engineering

- The first principle: the software it all exists
- The second principle: KISS(keep it simple, stupid !)
- The third principle: maintain the vision
- The fourth principle: what you produce, other will consume
- The fifth principle: be open to the future
- The sixth principle: plan ahead for reuse
- The seventh principle: think

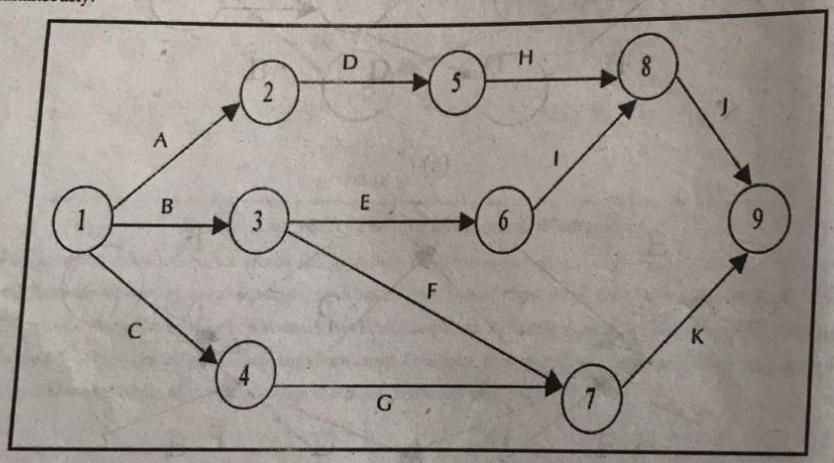
Q2 c).

Example 3: Construct a network for a project whose activities and their predecessor relationship are given in following Table.

Activity Sequence for a Project

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

Solution: The network diagram for the given problem is shown in following Figure with activities A, B and C starting simultaneously.

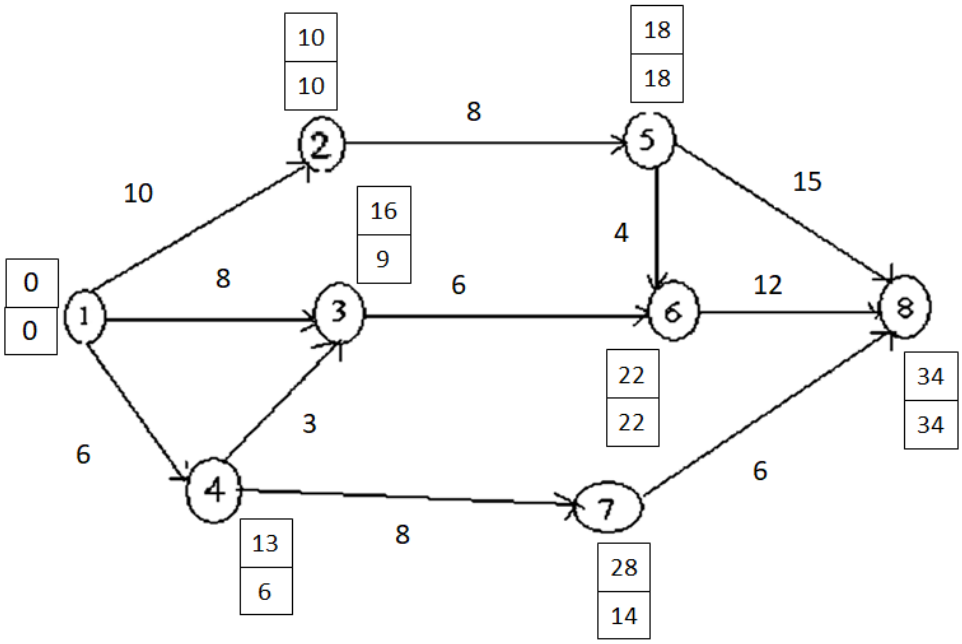


Network Diagram

Q2 d) Any three points.

CPM	PERT
• CPM works with fixed deterministic time	• PERT works with probabilistic time
•CPM is useful for repetitive and non complex projects with a certain degree of time estimates.	•PERT is useful for non repetitive and complex projects with uncertain time estimates.
• CPM includes time-cost trade off.	•PERT is restricted to time variable.
• CPM- for construction projects.	• PERT- used for R&D programs.

Q3 a)



Activity	To	Tm	Tp	Expected time	Variance
1-2	8	10	12	10	0.44
1-3	6	8	10	8	0.44
1-4	8	5	8	6	0.00
2-5	6	8	10	8	0.44
3-6	2	7	8	6	1.00
4-3	2	3	4	3	0.11
4-7	6	8	10	8	0.44
5-6	2	4	8	4	1.00
5-8	13	17	11	15	0.11
6-8	10	12	14	12	0.44
7-8	3	6	9	6	1.00

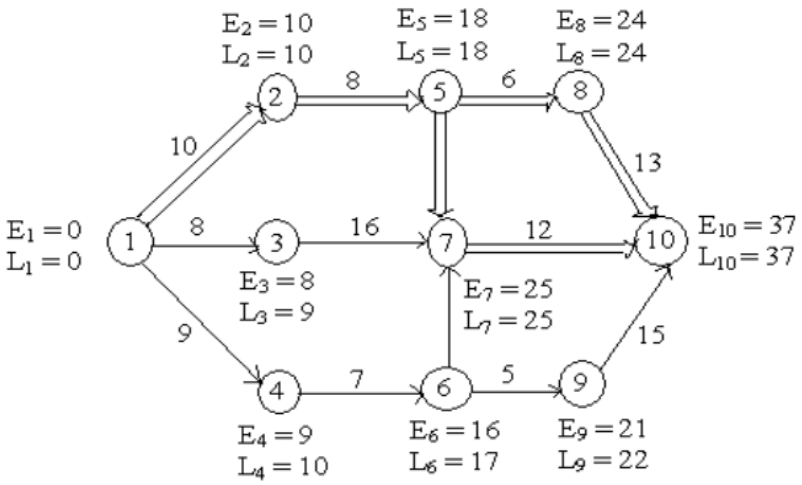
Critical Path: 1-2-5-6-8

Duration -34

Q3 b)

Solution

Calculation of E and L for each node is shown in the network



Activity(i, j)	Normal Time (D_{ij})	Earliest Time		Latest Time		Float Time ($L_i - D_{ij}$) - E_i
		Start (E_i)	Finish ($E_i + D_{ij}$)	Start ($L_i - D_{ij}$)	Finish (L_i)	
(1, 2)	10	0	10	0	10	0
(1, 3)	8	0	8	1	9	1
(1, 4)	9	0	9	1	10	1
(2, 5)	8	10	18	10	18	0
(4, 6)	7	9	16	10	17	1
(3, 7)	16	8	24	9	25	1
(5, 7)	7	18	25	18	25	0
(6, 7)	7	16	23	18	25	2
(5, 8)	6	18	24	18	24	0
(6, 9)	5	16	21	17	22	1
(7, 10)	12	25	37	25	37	0
(8, 10)	13	24	37	24	37	0
(9, 10)	15	21	36	22	37	1

Network Analysis Table

From the table, the critical nodes are (1, 2), (2, 5), (5, 7), (5, 8), (7, 10) and (8, 10)

From the table, there are two possible critical paths

i. $1 \rightarrow 2 \rightarrow 5 \rightarrow 8 \rightarrow 10$

ii. $1 \rightarrow 2 \rightarrow 5 \rightarrow 7 \rightarrow 10$