**CGGC 5005 Midterm Exam – Winter 2023: February 21, 2023**

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Question 1. [5 marks]

Describe the four components of SWOT analysis and give an example for each one.

Answer:

Strength: This is described via organization with a goal, working towards their achievements. Ex: Strong Management, futuristic leaders. Young and dynamic resources procurement.

Weakness:

Threats: Natural Disasters, calamities. Due to these organization cannot get the work done in terms of reliability, scalability when there is network outage. Ex: storm, earthquake

Opportunities:

Invest in modern technologies to get the projects in organization that achieves better results. Ex: Automation of products that can be done a robot, instead of having 100 members workforce to do the same task.

Threats:

This damages the branding of an organization. Ex: Leakage of company confidential information to outside world possesses an intense threat that makes organization vulnerable to customers, making people unsafe with respect to privacy.

Question 2. [5 marks]

Describe the characteristics of traditional Waterfall and Agile methodologies. Give an **example** of when it would be best to use each methodology.

Answer:

Waterfall methodology: - Example - construction of a bridge or building

* Sequential and linear
* Emphasizes planning and documentation
* Each phase must be completed before the next one
* Does not allow for changes once a phase is completed
* Suitable for well-defined and stable projects

Agile methodology: - Example: developing a new software product

* Iterative and incremental
* Emphasizes collaboration and communication
* Allows for changes and adjustments
* Delivers a working product incrementally
* Suitable for projects with changing requirements

Question 3. [5 marks]

What is involved in project scope management, and why is good project scope management so important on information technology projects? What is involved in collecting requirements for a project?

Answer:

Project scope management: Good for defining documents, managing the requirements, creating work break down structure. Project time estimation, meeting its objectives, deadlines, able to manage cost not crossing overboard than estimated, aligning with project needs, not go out of planned structure.

In information technology, it is best resources procurement based on project requirements, document the development, testing, execution phases of work, reporting to designated person to keep in line of cost management, meeting deadlines.

Collecting requirements is gathering documents, managing project requirements. Helps manager, team leads to match and deliver desired outcomes and deliver the meets to stakeholders/client/customers

Question 4. [5 marks]

What is a Work Breakdown Structure (WBS)? Why do you need a good WBS on projects?

Answer: WBS is a form of planning the phases of a project that can be involved deadlines, Miles stones, costing of resources based on hours worked on project and the dependencies, gathering business requirements, planning, BA analysis of scope in the market, tasks identified, project activities that are to done when analyzed. Helps allocating resources as suggested before based on requirements, approvals from management, testing of project be it quality, risks assessments, rebuilding, fixing the risks can be done. Tracking will be easier via Gantt charts, critical path and closure to the project.

Question 5. [5 marks]

In your own words, explain the following schedule development tools and concepts.

Gantt charts:

Visual representation of the project flow that includes phases, executions, milestones, cost of resources that are responsible, finishing the phases with in deadlines to monitor throughout the project. Example: Ecommerce website.

Critical path:

Referring to the example that I mentioned in Gantt chart, critical path is a plan that is estimated that work is done with certainty keeping in mind. For E commerce website, there is a lot requirements, functionality needs to be analyzed from BA, development work need to be done from developers, testing from QA, delivery to client from delivery management team, closure of the project with **dates** to follow with rigorous iterations if needed.

PERT (3-point Estimates):

PERT stands for Program Evaluation and Review Technique, is a project management tool that uses three-point estimates to determine the most likely duration of a project task or activity.

This calculates the expected duration of a task using the formula: (optimistic + 4 x most likely + pessimistic) / 6.

It helps in identifying the critical path of project, which is the sequence of tasks with the longest expected duration, it can be used to calculate the probability of completing a project within a certain timeframe, this is commonly used in conjunction with other project management tools and techniques, such as Gantt charts and WBS as explained above.

Milestones:

These are celebrated when the estimated work is done with in the time frame given for the team. In other words, it’s a goal to achieve for the team that has been set by themselves or given by management of organization.

Work Package:

Work Package is a specific task or an activity with a clear output, that is assigned to a person or to a team, managed as a smaller component of a project. It is used to organize, estimate, and track project work, assign responsibility and accountability, and facilitate communication and coordination among project team members and stakeholders.

Question 6. [5 marks]

When you would prepare Rough Order of Magnitude (ROM) vs. a definitive cost estimate for a project.

Give an example of how you would use each of the following techniques for creating a cost estimate: analogous, parametric, and bottom-up.

Ans: ROM estimate is used when little information is available in the early stages of a project while definitive cost estimate is used later when the more detailed information is available on project.

Examples of cost estimating techniques are -

Analogous - uses historical data from similar projects to estimate costs.

Parametric - uses a formula or algorithm to calculate cost based on project variables.

Bottom-up - involves estimating the cost of individual project components, then aggregating them to create a total cost estimation.

Question 7. [5 marks]

In use case diagrams:

1. What is an Actor?

Ans: A person, group or system that interacts with systems that got developed or designed.

1. What is a use case?

Ans: Use case is an Interaction with actor or system that’s developed or designed

1. What is a system boundary?

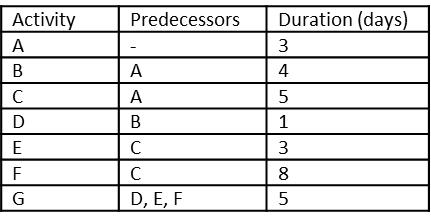
Ans: Represents the limits of system that is inside or outside that’s being developed or designed.

1. What is the different between include and extend relationship?

Ans: Include relationship is shared by multiple use cases/interaction while exclude can be defined as optional interaction/use case that may be not require to complete

Question 8. [5 marks]

Using the CPM diagram below diagram:



|  |  |  |
| --- | --- | --- |
| 3 | 4 | 7 |
| B | | |
| 11 | 8 | 15 |

|  |  |  |
| --- | --- | --- |
| 7 | 1 | 8 |
| D | | |
| 15 | 8 | 16 |

|  |  |  |
| --- | --- | --- |
| 0 | 3 | 3 |
| A | | |
| 0 | 0 | 3 |

|  |  |  |
| --- | --- | --- |
| 16 | 5 | 21 |
| G | | |
| 16 | 0 | 21 |

|  |  |  |
| --- | --- | --- |
| 3 | 5 | 8 |
| C | | |
| 3 | 0 | 8 |

|  |  |  |
| --- | --- | --- |
| 8 | 3 | 11 |
| E | | |
| 13 | 5 | 16 |

|  |  |  |
| --- | --- | --- |
| 8 | 8 | 16 |
| F | | |
| 8 | 0 | 16 |

|  |  |  |
| --- | --- | --- |
| ES | Duration | EF |
| Task Name | | |
| LS | Float | LF |

Key:

1. What is the critical path for this project?

ANS: A-> C-> F -> G = 21 days

1. What is the float for Activity E?

ANS: 3

1. If Activity C is delayed by 3 days, what will be the impact to the overall project schedule?

ANS: the new total duration will be in activity G, EF would be 24 days, for activity F the EF would be 19. Overall, the project would extend 3 days more.

1. If Activity D is delayed by 5 days, what will be the impact to the overall project schedule?

ANS: No Impact on schedule.

1. What is the latest day Activity B can start without causing a delay the overall project?

ANS: 7th day

Question 9. [10 marks]

You have a project to build a new fence. The fence is four sided as shown below. Each side is to take one day to build and is budgeted for $1,000 per side. The sides are planned to be completed one after the other. **Today is the end of day three**.

Answer the questions below using this project status chart (do the calculations to 3 decimal place accuracy):

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Activity** | **Day 1** | **Day 2** | **Day 3** | **Day 4** | **Status End of Day 3** |
| **Side 1** | S ---------- F |  |  |  | Complete, spent $1,000 |
| **Side 2** |  | S ---------PF | ---- F |  | Complete, spent $1,200 |
| **Side 3** |  |  | PS---S---PF |  | 50% done, spent $600 |
| **Side 4** |  |  |  | PS-------PF | Not yet started |

***Key****: S = Actual Start, F = Actual Finish, PS = Planned Start, PF = Planned Finish*

*At the end of the 3rd day:*

1. What is the Planned Value?

PV=3000$

1. What is the Earned Value?

EV= 1000+1200+300(50% of side 3 wall) = 2500$

1. What is the Actual Cost?

AC=1000 + 1200+ 600 = 2800$ = Total spent value till 50% of side 3 is done.

1. If this project is handled at the same cost performance as present, how much more will this project cost after the end of the third day?

Cost variance = 2500 – 2800 = -300$

Schedule Variance (SV) = ev-pv = 2500 – 300 = -500$

CPI: EV/AC = 2500/2800 = 0.8929

SPI: 2500/3000 = 0.833

EAC = 4000/0.8929 = 4479.784$

ETC= EAC-AC => 4479.784 – 2800 = **1679.78$** more for the end of 3rd day for project cost

1. What is the Variance at Completion (VAC)?

VAC= BAC – EAC: 4000- 4479.784 = **-479.784$**

**Reference Material: Earned Value Management (EVM) – Key terms and formulae**

|  |  |
| --- | --- |
| **Name** | **Formula** |
| Earned Value (EV) | % Complete x PV of Task |
| Cost Variance (CV) | EV – AC |
| Schedule Variance (SV) | EV – PV |
| Cost Performance Index (CPI) | EV / AC |
| Schedule Performance Index (SPI) | EV / PV |
| Estimate at Completion (EAC) | BAC / CPI |
| Estimate to Complete (ETC) | EAC – AC |
| Variance at Completion (VAC) | BAC - EAC |