

Venue \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Seat Number \_\_\_\_\_\_\_\_

Student Number |\_\_|\_\_|\_\_|\_\_|\_\_|\_\_|\_\_|\_\_|

Family Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

First Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**BX2077 Project Management**

Formal Exams SP21, 2020

FINAL Examination

College of Business, Law & Governance

**Applied – Calculation Case Scenario**

Lance, after years as a successful engineering career, has decided to pursue his lifelong dream of opening a photography business. Lance has been dabbling in photography for a number of years and has become quite the master. His primary products include pictures of the Australian outback. Lance has been selling his products at local markets, arts and craft fairs, and at local businesses.

Business has been picking up significantly and Lance feels that now is the time to launch a website for his business. Lance wants a website that will showcase his products, allow secure online ordering, and has social media capability. In addition, Lance would like to provide videos on the process of taking amazing photos. The videos will be free for a two week period and then there will be a nominal monthly subscription fee. This monthly fee will allow one to watch unlimited videos and download samples of his work. Lance wants to add enough videos to get the subscription service started and then he will add additional new videos each month.

He contacts Leigh, a family friend, who owns a software and website development business. They meet for lunch and Lance gives her all the specific requirements for the website. Lance would like to have a website launched in less than three weeks. He will be a vendor at a large art show in six weeks and wants a website in place so potential visitors can peruse his products prior to the show. Leigh is happy to help Lance with the website and carefully takes notes of all his website requirements. She tells Lance that she needs to estimate how long the website project will take given that she and her employees are in the midst of several projects. However, she promises that she will try her best to have the project completed within three weeks. Lance tells Leigh that he is willing to pay extra in order to have the website completed within a three week period.

Leigh goes back to her office and puts together the project activities, the time to complete each activity, and whether an activity time can be reduced (crashed) by hiring additional workers. She does not want to begin shooting videos for the subscription service (Activity J) until the videos for photography are complete (Activity B). Table 1 provides the activity, description, time to complete an activity, predecessors, and the maximum amount that an activity can be crashed (completion time reduced). Leigh needs your help. Her project management expert is on vacation this week.

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| --- | --- | --- | --- | --- | --- |
|  | | **Table 1** | | | |
| **Activity** | **Description** | | **Predecessor** | **Est. Time (days)** | **Max crash amount** |
| A | Sample pictures | |  | 3 | 1.5 |
| B | Videos on how to take pictures | |  | 5 | 3 |
| C | Design of the website and main page | |  | 2 | 1 |
| D | Design of the website and catalogue | |  | 2 | 1 |
| E | Design of the website ordering systems | |  | 2 | 1 |
| F | Completion of the website main page which includes pictures and videos | | A, B, C | 2 | 1 |
| G | Review and changes of the website main page | | F | 1 | 0 |
| H | Completion of the product catalogue and ordering systems | | A, B, D, E | 2 | 1 |
| I | Review and changes to the product catalogue and ordering systems | | H | 1 | 0 |
| J | Videos for the subscription system | | B | 15 | 5 |
| K | Design of the website subscription section | | J | 2 | 1 |
| L | Social media | | J | 2 | 1 |
| M | Final website integration, review and changes | | G, I, K, L | 2 | 0 |

**FORMULA SHEET**

BUDGET , COSTS & SCHEDULE:

Total Budgeted Costs (TBC) = summed costs of each individual work-package for an activity

Actual costs (AC) = actual costs of work done in that activity

Planned Value (PV) = Cumulative Budgeted Costs (CBC) = sum of all TBC for each activity

Rate of Performance (RP) = Actual work completed/percentage of work planned to have completed

Earned Value (EV) = % Complete x TBC (for the activity)

= PV to date x RP

Cost Performance Index (CPI) = EV/AC

Cost Variance (CV) = EV – AC

Schedule Variance (SV) = EV - PV

Scheduled Performance Index (SPI) = EV/PV

Forecasted Cost to Completion (FCAC) = TBC / CPI

Estimated Time to Completion = Original Completion Time Estimated/SPI

**PART A (20 marks)**

1. Develop a project network diagram that shows all the activities and precedence relationships. Explain the importance of a network diagram for project management, providing examples of the benefits. **(7 marks)**

**A network diagram is important as it helps project managers visualize the project. For example, the diagram shows what activity predecesses the other. Therefore, project managers will know which activity requires to be completed first before the other can begin.**

**Some of its benefits are:**

1. **It tracks what projects are dependent on other and the issues that could arise as a result.**
2. **It creates a visual representation of how the project is fairing. This visual representation can be presented to the shareholders.**
3. Determine the critical path activities. Describe the critical path, why it exists and provide justification for including those activities illustrated. **(7 marks)**

The critical path is the longest sequence of activities that can be taken to complete the project. The activities in the critical path can never be delayed as they will cause a delay in the whole project. However, the other activities that are not in the critical path cannot be delayed.

1. What is the shortest time that the project can be finished if crashing is allowed? Discuss why a project may require to be crashed, providing a specific example drawn from the provided case study. **(6 marks)**

A project may need to be crashed, if there is need to complete the project earlier than expected. Crashing will thus help reduce the overall time the project takes.

**PART B (30 marks)**

The financials for the project are listed below and forecast for the first 24 days of the project. Considering the table below, calculate the following schedule and cost variances, providing a brief paragraph explaining why each calculation is relevant to project management.

1. What is the Earned value and the planned value? **8 marks**
2. What is the Estimated Time to Completion? **8 marks**
3. What is the Actual cost of work performed (AC)? **6 marks**
4. Is this project on track to be completed on budget and time? **8 marks**

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