UNIVERSITY EXAMINATIONS

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INF3708

Software Project Management

100 Marks

Duration 2:30 Hours

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This paper consists of 7 pages.

Instructions:

1. **Answer ALL questions.**
2. **Non-programmable calculators may be used.**
3. **Show all calculations and round off all your calculations to two decimal places.**
4. **The use of textbook is not allowed.**
5. **Candidates must complete the online declaration of own work when accessing the assessment tools. Module specific declarations must be submitted as part of the answer file in a single PDF document, if so instructed in the examination question paper.**
6. **The final document containing your answer should be converted to a pdf document – similar to your INF3708 assignment 03.**
7. **Ensure that a complete PDF document containing all answers is uploaded on the official platform at the conclusion of the examination. Only the last PDF document uploaded and submitted will be marked.**
8. **The final pdf document should not be password protected**
9. **Examination responses that are submitted with a password protected PDF will not be marked.**

10. **Examination responses that are illegible due to poor image quality or are corrupted will not be marked.**

11. **Examination responses that contain a virus will not be marked.**

12. **Students should not communicate with other students, or request assistance from other students during the examination.**

13. **Plagiarism is a violation of academic integrity and students who do plagiarize or copy verbatim from published work will be in violation of the Policy on Academic Integrity and the Student Disciplinary Code and may be referred to a disciplinary hearing.**

GOOD LUCK!!

Case Study

Duglas IT is a company in the business of installing IT systems and software for businesses. It performs works of developing, upgrading and installing IT systems and software throughout East Africa. Like other companies in the IT business, Duglas IT considers each job a project and demploys project manager to meet its goal. For each job received, an overall responsibility is assigned to a project manager whose responsibility is to oversee the project.

Duglas IT has been approached by Dalaza food. The company future depends on its ability to continuously develop and market new food products. Dalaza specialises in food and drink additives. Dalaza is also a representative of all kind of firms in the industries like biotechnology, pharmaceutical computer and entertainment electronics.

The focus of Dalaza concerns maintaining market share for new food products (particularly product T) through good online marketing as that accounts for the major part of its profit. It came to Dalaza's attention that another company is beginning to market a similar product (product D) with the same functionalities to product T to their customers. To beat the competition, they decided to embark on a project for a new and a better marketing software. The exact requirements of what the system will cover were outlined. In that regards Dalaza considers the following criteria very important to them and that need to be prioritized in their project selection: Reliable marketing tools 30%; High customer reach 40%; Strong system (system that can stand the test of time) 15%; a system with high buy-in from all the stakeholders 15%. Nonetheless, there is still a possibility of adding and removing requirements. The issue of the project cost and time will emerge as the project progresses.

For this reason, Dalaza approached Duglas for a guidance of a project manager/s as there are many considerations in deciding, selecting, developing and/or modifying IT projects. Assume that you are the project manager assigned to handle the Dalaza project and you will require assistance from people who will form part of your team.

QUESTION 1 [12 Marks]

1.1 As a project manager, you do not only strive to meet scope, time, cost and quality of Dalaza's project you manage, but you also facilitate the entire process to meet the needs and expectations of people involved in the project activities

Discuss at least 3 key capabilities you should or have developed to help you run the assigned project successfully (include in your discussion why you need to develop those capabilities. (6)

Answer:

Examples of competencies a project manager should develop include:

Project risk management: A Project Manager should be able to identify, analyse, and respond to project risk. Project risk management is important because the objective is to prevent the risk from emerging. For example, if it comes to your attention that a programmer is not fully competend in the programming language which will be deployed to develop the marketing software, it is advisable that the programmer joins a training course to raise their skill level to an acceptable standard.

Communication management: this competency enables a Project Manager the ability to generate, disseminate, and store information related to projects.

Stakeholder management: is a competency that helps a Project Manager to able to identify and analyse the needs of project stakeholders. includes identifying and analyzing stakeholder needs while managing and controlling their engagement throughout the life of the proect.

Scope management – involves defining and managing all the work required to complete the project successfully

Schedule management – commonly known as project time management, includes estimating how long it will take to complete the work, developing an acceptable project schedule and ensuring timely completion of the project.

Cost management – consist of preparing and managing the budget of the project

Quality management – ensures that the project will satisfy the stated or implied needs for which it was undertaken

Procurement management – involves acquiring or procuring goods and services for a project from outside the performing organisation.

Integration management – is an overarching function that affects is affected by all of the other knowledge areas

1.2 Dalaza's project is an IT project which is slightly different from ordinary project. Provide a discussion on the unique issues of IT industry that makes IT projects different from other type of projects. Your discussion should include how you think project managers should adjust to the differences. (6)

Answer

Software projects has similar characteristics with normal projects, but the characteristics that's different and difficult from other projects are:

- **Invisibility**: progress of software projects is not immediately visible.
- **Complexity**: Software projects contain more complexity per money spent than other engineering projects.
- **Conformity**: Software project developers have to conform to the requirement of their clients.
- **Flexibility**: Software systems are subject to change to accommodate physical or organisational systems.

IT projects are different from other types of projects because they can be very diverse in terms of size and complexity, they often include team members with very diverse backgrounds and skills, and he technologies involved are also very diverse. Project managers should adjust to these differences by paying careful attention to the goals of the project and the needs of various stakeholders

QUESTION 2 [12 Marks]

(FOR SUPPLEMENTARY AND FI CONCESSION STUDENTS PLEASE ANSWER QUESTION 2.1B:

2.1A Briefly explain the actions you will take with your team to perform the following process: **Initiating and Planning** (7)

Answer:

Descriptions of what happens in each of the five process groups are listed below:

Initiating - includes actions to commit to begin or end projects and project phases. Some deliverables include defining the business need for the project, getting a project sponsor, and selecting a project manager.

Planning - includes creating workable plans for the entire project. Every knowledge area requires development of some plans

2.1B Briefly explain the actions you will take with your team to perform the following process: **Feasibility and Planning**

Answer

Feasibility -

Planning - includes creating workable plans for the entire project. Every knowledge area requires development of some plans

2.2 Given the presented case, what project development life cycle approach will your team follow for the Dalaza's project and why. (5)

Answer

The team should follow iterative life cycle
With iterative approach, project scope is determine early but time and cost are modify as the understanding of the of the product increase. This approach works best when there is a high degree of change a low frequency of delivery

In relation to the case given, there is a possibility of adding and removing requirements and the issue of the project cost and time is not clear they will emerge as the project progresses making the iterative life cycle the most appropriate approach for the project team.

QUESTION 3 [17 Marks]

Table 1 gives the estimated cash flow for the two different projects: **Project 1 and 2** in South Africa Rand (R) that Dalaza is contemplating.

Year	Project 1	Project 2
0	-R350 000	-R255 000
1	+R75 000	+R5 000
2	+R75 000	+R20 000
3	+R65 000	+R35 000
4	+R55 000	+R50 000
5	+R53 000	+R80 000

Table 1: Projects Cash Flow

Based on the information provided in **Table 1** answer questions 3.1 – 3.4 that follow.

3.1 Calculate the net profit for the two projects. (4)

Answer

Project 1 Net Profit =

75 000 + 75 000 + 65 000 + 55 000 + 53 000 = 323, 000 - R350 000 = -27 000

Project 2 Net Prof =

5 000 + 20 000 + 35 000 + 50 000 + 80 000 = 190 000 - R255 000 = -65 000

3.2 Calculate the Return on Investment (ROI) for the two projects. (4)

Answer

Project 1:

= (average annual profit/Total investment) x 100
((-27 000/5)/ 350 000) * 100
(-5 400/350 000) * 100
= -1.54%

Project 2:

= (average annual profit/Total investment) x 100
((-65 000/5)/ 255 000) * 100
(-13 000/255 000) * 100
= -5% or -5.09%

3.3 Calculate the payback period for each of the two projects in Table 1. (6)

Answer

Project 1
Payback period = breakeven year – (profit made in breakeven year/ income in breakeven year)
= 5-(-27 000/53 000)
= -**5.5 years or**

Project 2
Payback period = breakeven year – (profit made in breakeven year/ income in breakeven year)
= 5-(-65 000/80 000)
= -**5.8 years**

3.4 Advise your client company Dalaza on the best project it should consider for development and why? (3)

Answer

Based on the calculations above, none of the projects between Project 1 and Project 2 is worth implementing because there is negative net profit, the investment will yield negative return and the project will not be able to pay its investment within its life time of 5 years.

However, if forced to recommend a project, I will recommend project 1 because its net loss is less 27 000, the ROI/LOI is also less and 1.5% and finally, the company will only payback more 5 months after the end of the project instead of 8 months of project 2

QUESTION 4 [23 Marks]

N:B – PLEASE DO NOT ANSWER QUESTION 4.3 IF YOU ARE A SUPPLEMENTARY OR FI CONCESSION STUDENT. ANSWER ONLY QUESTION 4.1 AND 4.2 THEM ANSWER QUESTION 7.

4.1 Given a discount rate of 8% in Table 2 below; calculate the Net Present Value (NPV) for **project 1 and 2**. Use the cash flow in Table 1 above. Please show all your caculations. (8)

Year	8% Discount rate
1	0.9259
2	0.8573
3	0.7938
4	0.7350
5	0.6806

Table 2: 8% discount rate

Answer

YEAR	DISCOUNT FACTOR @8% Discount Rate	ESTIMATED CASHFLOW Project 1	DISCOUNTED CASH FLOW	ESTIMATED CASH FLOW Project 2	DISCOUNTED CASH FLOW
0	1	-350000	-350000	-255000	-255000
1	0,9259	75000	69442,5	5000	4629,5
2	0,8573	75000	64297,5	20000	17146
3	0,7938	65000	51597	35000	27783
4	0,735	55000	40425	50000	36750
5	0,6806	53000	36071,8	80000	54448
Net Profit		-27000		-65000	

NPV			-88166,20		-114243,50

4.2 Based on your calculation of the project Net Present Value (NPV), would you still maintain your advice on Q3.4? Motivate your answer. (3)

Answer

Again None of the project worth recommending but if one have to, Yes, I will still recommend Project 1. Because project 1 still maintains less negative NPV

4.3 The assessments your project team performed so far on projects 1 and 2, which the advice of 3.4 was based, did not take into consideration criteria that are important to the client company. Put those criteria into consideration and calculate the weighted score for the two projects and **re-advise accordingly**. The project scores are in Table 3 below.

Criteria	Weight	Project 1	Project 2
		56	70
		48	53
		30	27
		70	55
Weighted project score			

Table 3: weighted scoring as a method of project selection

(12)

Answer

Criteria	Weight	Project 1	Project 1 - Weight	Re-Advise Weight	Project 2	Project 2 Weight	Re-Advise Weight
Reliable Marketing Tools	30	56	16,8	20	70	21	30
High Customer Reach	40	48	19,2	25	53	21,2	35
Strong System	15	30	4,5	40	27	4,05	25
High Buy-In from Stakeholders	15	70	10,5	15	55	8,25	10
Weighted Project Score	100		51	100		54,5	100

On the bases of weighted score calculation, project would be recommended as it scores higher than project 1.

QUESTION 5 [23 Marks]

The project you advised Dalaza for development has the following activities with their precedents and durations listed in Table 4. The activity durations are in days.

Activity	Duration in days	Predecessor
A	3	-
B	7	A
C	8	A
D	6	A
E	14	B & C
F	9	C & D
G	11	D & F
H	5	G & E

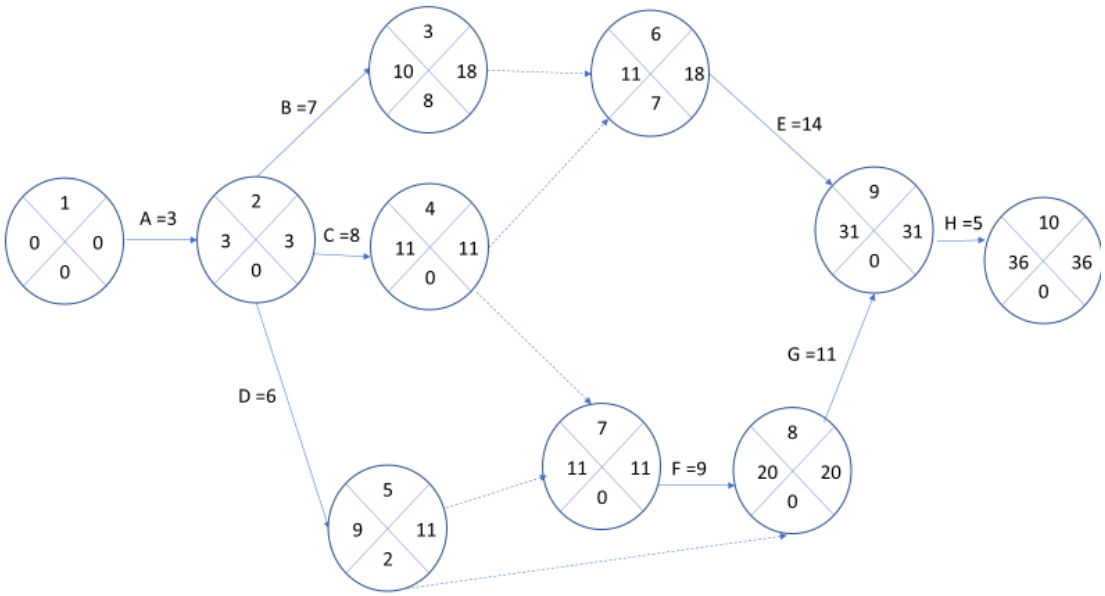
Table 4: Activity precedents and their durations

5.1 Draw a network diagram Activity-on-Arrow (AOA). Indicate the activity duration, the event number, earliest date, latest date and float on each node by completing both a forward and backward pass. (14)

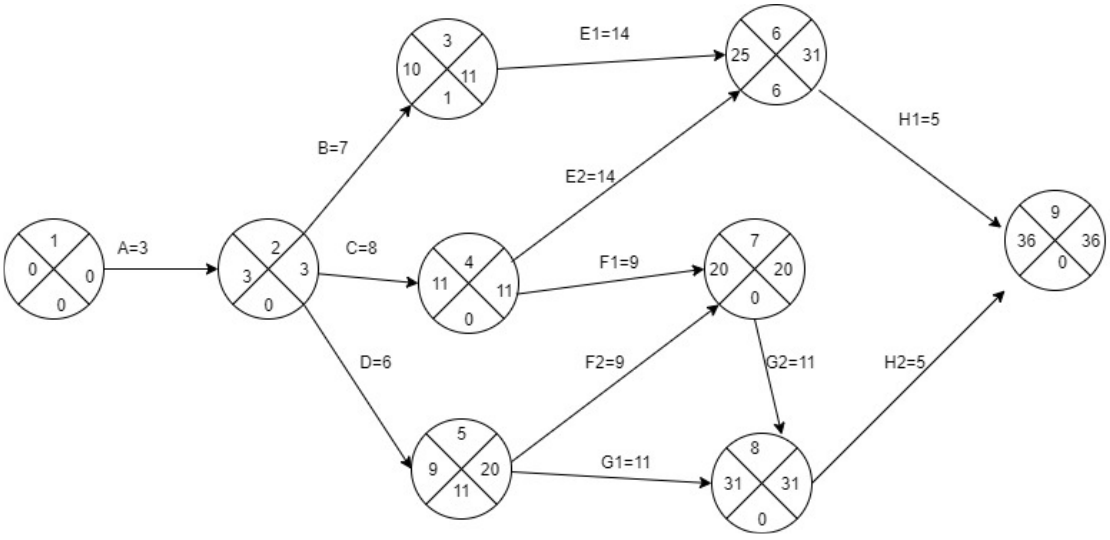
(N:B) 5 marks will be deducted from students for not drawing the correct activity diagram.

Answers

Option 1



Option 2



5.2 How would you describe what a critical path is? (2)

Answer

A critical activity is a path that shows the duration of a project and it the longest path in the project network diagram.

Why is it important to know and identify a critical path in an activity network? (2)

Answer

It helps the project team to identify the critical activities. These are activities that any delay in them will delay the duration of the project. Therefore knowing these activities will help the project team put priority on critical path activities when allocating project resources.

Indicate the critical path of your AOA diagram (2)

Answer

The critial path is A-C-F-G-H

5.3 How many paths does the project have? Which is the longest path and why do you consider it the longest path? (3)

The project has 3 paths

A-B-E-H

A-C-F-G-H

A-D-F-G-H

The longest path is the project critical path.

QUESTION 6 [13 Marks]

Based on some of the project activity depicted on Table 4. Assuming that at week 20 into the 35 weeks project the Dalaza project status is as follow:

Planned Value (Planned) = R60 000
Actual Cost (AC) = R90 000
Earned Value (EV) = R45 000

Take the budget at complete for each project to be the initial investment on the project as depicted on Table 1.

Irrespective of the project you recommended for development in Q3, still use the PV, AC and EV values presented above to calculate the following for the project you recommended:

(a) Cost variances. (2)

Answer

CV = EV – AC

CV = 45 000 – 90 000 = -R45 000

(b) Schedule valances. (2)

Answer

SV = EV – PV

SV = 45 000 – 60 000 = -R15 000

(c) Cost performance index (2)

Answer

CPI = EV/AC

CPI = 45 000/90 000 = 0.5

(d) Estimate at completion for the project you recommended after weighted score calculation (3)

Answer

EAC = Budgeted cost/CPI

Project 1
350 000/0.5 = 700 000

Project 2
255 000/0.5 = 510 000

(e) What does the a-d calculations tell you about the project? (4)

Answer

The project CV is negative meaning that performing the project work costs more than planned. Hence the project is above cost. Hence, the CPI of less than one shows that the project is over budgeted.

The same is also the case with SV. The nagetive value achieved above indicates that the project is running behind schedule.

QUESTION 7 [12]

7.1 Idenifiying and managing risks are important part of IT project management. As a project manager for the case study, **what could you have foreseen as problems that could be identified as risks that are likely to occur for the development of the marketing system and what are the reduction techniques you would employee to reduce the chances of the risks.** (6)

7.2 List and discuss at least two common risk identification approaches you used in identifying listed in Q7.1. (6)

Answer

Risk identification approaches include:

Brainstorming: with this techique a group attempt to generate ideas or fine a solution for a specific problem by amassing ideas spontaneously and without judgement

Delphi: this approach tries to derive a consensus among a panel of experts who make predictions about future developments. Delphi is based on independent and anonymous input regarding future events. It uses repeated rounds of questionning and written responses including feedback to responses in earlier rounds, to take advantage of group input while avoiding the biasing effects of oral panel deliberation.

Interviewing – fact – finding technique for collecting information in face-to-face phone, e-mail, or virtual discussion