NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF ENGINEERING

DEPARTMENT OF ELECTRONIC ENGINEERING

PROJECT MANAGEMENT (TEE 5155)

Final Examination Paper

December 2019

Time Allowed	:	3 hours
Total Marks	:	100
Examiner's Name	:	Mr Bhekisisa Nyoni

INSTRUCTIONS

1. This examination paper consists of 7 printed pages
2. Answer **ANY 4 QUESTIONS** of your choice.
3. Each question carries 25 marks
4. Show all your steps clearly in any calculation (Use of calculators is permissible)
5. Start the answers for each question on a fresh page.

MARK ALLOCATION

QUESTION	MARKS
1.	25
2.	25
3.	25
4.	25
TOTAL	100

Question 1

a) In a survey conducted by project managers at a leading telecommunications company to determine the time taken to develop the backend of their new Video-On-Demand mobile application, the following data was established:

Most pessimistic time = 14 days
Most likely time = 12 days
Most optimistic time = 4 days

What would be the most appropriate estimate for this activity in a project network diagram?

[3 marks]

b) A project consists of eight activities, the details of which are given below:

No.	*Activity*	*Duration (days)*	*Immediate Processors*
1	A	1	-
2	B	3	A
3	C	5	-
4	D	3	B, C
5	E	1	D
6	F	12	-
7	G	3	E, F
8	H	1	G

Table Q1 Project Information

i) Construct a network diagram for the project using the activity-on—node method.

[10marks]

ii) Determine the critical path of the project

[1 mark]

iii) Calculate the project completion time in weeks *(Assuming a 5 day working week)*

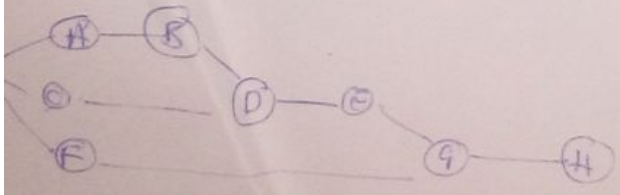
[2 marks]

iv) Determine the float (free slack) on activities A, C, E and G.

[4 marks]

v) If the activity, F, is now completed in 8 days only, what would be the critical path and the project completion time in days?

[5 marks]



Question 2

a) Projects are typically authorized and undertaken as a result of some strategic considerations such as 'market demand'. Identify five (5) other strategic considerations and discuss how each prompts organisations to plan for and implement projects. Give a good example for each identified strategic reason for doing projects.

[15 marks]

b) Write short notes on (or define):
   i. A project
   ii. Project Management
   iii. Project Triple constraints
   iv. Project charter
   v. Projectised organization

[10 marks]

Question 3

a) Consider the case of your Final year project, come up with a three level coded work breakdown structure and the WBS Dictionary showing clearly the basis used to create the WBS. *State the project title clearly.*

[9 marks]

b) Identify any two risks associated with your project (one threat and one opportunity). Come up with a sample risk register for one of these two risks.

[12 marks]

c) Discuss the risk response strategies for the two risks identifies in (b).

[4 marks]

Social Need – Tokwe
Technological → IPV4 / 6
Legal → 3G to 4G
Business → need – Installation of sophisticated (competitive) with capacity readiness to enjoy economies of scale.
Strategic opp →
Environmental → Solar – Green

/2

Continues

Question 4

a) What is the Delphi technique? → deriving a consensus among [2 marks] expe

b) State 5 selection criteria for project management software.

[5 marks]

c) With the aid of a diagram or illustration, explain the activities involved in the five (5) phases of the project life cycle

[10 marks]

d) A mining company that you work for is undertaking a project that is scheduled to take 25 days to complete. For this project the company has shortlisted a technical consultancy to do the project at a cost of US$7 000.00/day. Alternatively, the company could purchase some equipment whose cost is US$112 700.00 and undertake the project internally. However this option will incur a daily operational costs of US$5 200.00. As the Project Manager of this very project, the Technical Director has tasked you to come up with a recommendation of which option to choose. Justifying the recommendation you put forward and indicate any savings to be realised.

[8 marks]

Time → 25-days.

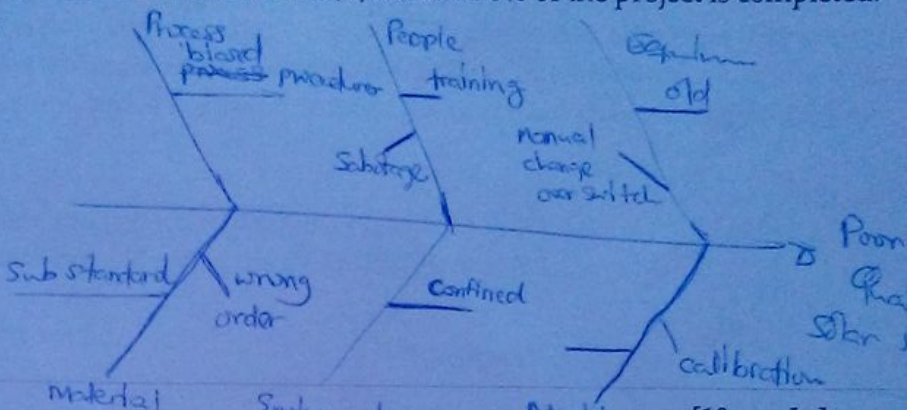
1) technical consultancy → 7000 / pd.

2) Equip → 112 700. one. + 5.200 / ~~pd~~ day.

Question 5

a) You are building a 4-sided fence. Each side is of equal length and you estimate that each side will contain the same material and labor costs as well as take the same amount of time to complete. You estimate that the project will take 4 days to complete and your budget, including a contingency reserve is $4,000. At the end of 3 days, you are asked to prepare an Earned Value calculation in order to determine how the project is progressing. You determine that as of the end of day 3, total costs incurred are $3,500 and 70% of the project is completed. Calculate the following:

i. BAC
ii. EV
iii. PV
iv. SPI
v. SV
vi. CPI
vii. CV
viii. EAC
ix. VAC
x. ETC



[10 marks]

b) A recent Herald article reported that the National University of Science and Technology is designing an electric trolley bus for Zimbabwe. The project is said to be a collaboration between the NUST innovation hub and WISE Africa. The project is reportedly a well-developed concept. Suggest at least two (2) primary stakeholders. Determine each stakeholder's information needs, the frequency with which the Project Manager will need to communicate with them, and mode of communication. *(Tabulate your answers)*

[8 marks]

Quality problems are often best addressed through the collective experience of project team members. Team members meet in brainstorming sessions to generate ideas about problems. These ideas can be recorded on an Ishikawa diagram.

Suppose you were the team leader of a project team that recently installed a solar power system with a changeover switch at a home in Burnside, Bulawayo. The client has called in to highlight his disappointment with the system and in response management has asked you to lead a brainstorming session to discover possible quality issues to revisit in this installation. Construct a sample Ishikawa diagram to illustrate possible problems that led to poor quality.

[7 marks]

Question 6

a) Distinguish between these schedule compression techniques 'fast tracking' and 'crashing'.

[4 marks]

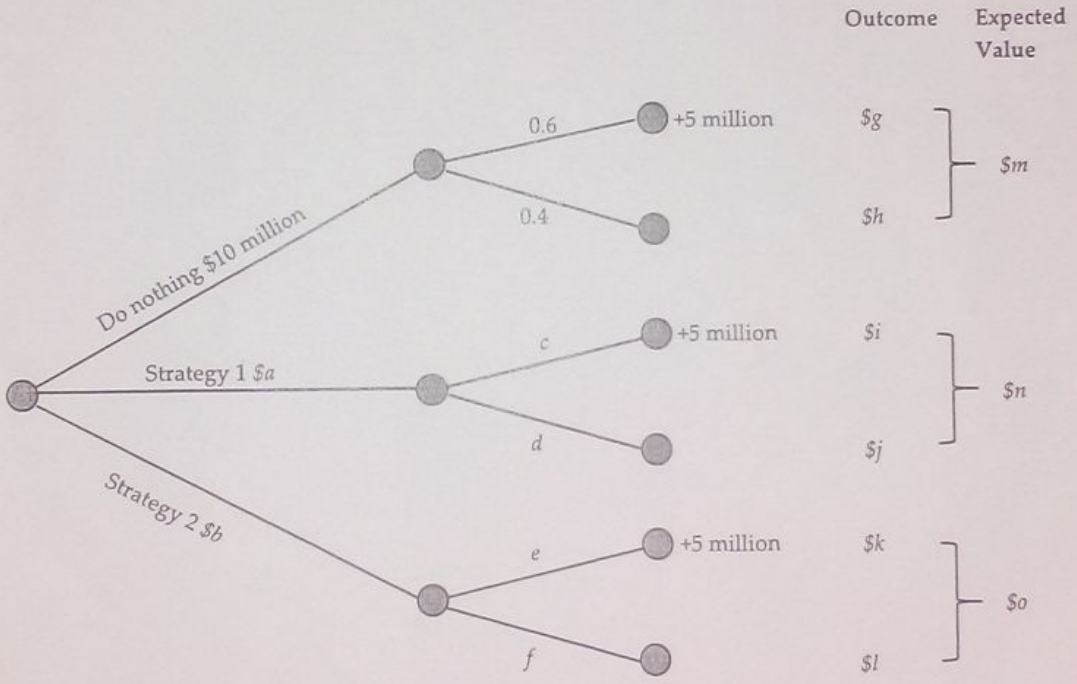
b) What constitutes the performance measurement baseline?

[3 marks]

c) An application of decision trees is in deciding between alternative risk responses. Suppose a project has a baseline cost estimate of $10 million, risk failure likelihood of 0.6, and a risk impact of $5 million. Two strategies are being considered to reduce the risk likelihood (but not the risk impact):

Strategy 1 will cost $2 million and will reduce the failure likelihood to 0.1.
Strategy 2 will cost $1 million and will reduce the failure likelihood to 0.4.

The decision tree is shown below:



i) Complete the decision tree to find the values of a – o.

[7 marks]

ii) Which is the best strategy to reduce the risk likelihood?

[1 marks]

d) Choose one project from one of the following; Software (IT) Projects/ Industrial Automation Projects/ Embedded Systems Design Projects. Describe the causes of project failure in the execution and implementation of the project.

[10 marks]