



# MANICALAND STATE UNIVERSITY OF APPLIED SCIENCES

## FACULTY OF ENGINEERING, APPLIED SCIENCES AND TECHNOLOGY

DEPARTMENT: COMPUTER SCIENCE AND INFORMATION SYSTEMS

MODULE: ICT PROJECT MANAGEMENT

CODE: INSY222

SESSIONAL EXAMINATIONS  
APRIL 2024

DURATION: 3 HOURS

EXAMINER: MR S. MARIME

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### INSTRUCTIONS

1. Answer *All* in Section A
2. Answer any *three* questions in Section B.
3. Start a new question on a fresh page
4. Total marks 100

*Additional material(s): Calculator*

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## SECTION A

### QUESTION 1

- a) Manicaland State University of Applied Sciences' ICT department has decided to develop a Students Registration and Records Management system for the institution. The activities to be done and their durations are indicated in the table below:

Activity	Duration in weeks	Dependencies
A	5	-
B	2	-
C	3	A, B
D	5	-
E	6	-
F	4	D, E
G	2	C, F
H	5	G
I	7	G
J	3	H

- i. Draw an activity network diagram for these 10 project tasks (A to J). (5)
  - ii. List the network paths. (4)
  - iii. Determine the critical path of the project and calculate the minimum duration of the project. (2)
  - iv. Determine the float for each node on the activity network diagram. (5)
- b) Task I takes one week longer than planned. Identify and explain briefly the resultant changes to the activity network diagram and critical path. (2)
- c) Draw a Gantt chart for the revised project, incorporating the changes to Task I as defined in part b). Show task durations, dependencies and critical path. (7)

## SECTION B

### QUESTION 2

- a) Describe FOUR techniques for carrying out quality control on a software system during development. (8)
- b) In addition to software what else can be tested on an ICT project? (5)
- c) Identify and explain two different techniques that can be used to estimate the size of a software project. (4)
- d) Given the following COCOMO constraints table:

Software Project	$a_b$	$b_b$	$c_b$	$d_b$
Organic	2.4	1.05	2.5	0.38
Semi-detached	3.0	1.12	2.5	0.35
Embedded	3.6	1.20	2.5	0.32

Assume that you are to use the basic COCOMO model to do estimations for a project. The project is semi-detached and a person on your team who has done this before estimates the total source lines of code to be 36200. The average salary of each software engineer is \$2500.00 per month.

- i. Calculate what COCOMO would predict for the effort to be applied for this project in person-months. (2)
- ii. Calculate what COCOMO would predict for the total duration of this project in months. (2)
- iii. Calculate the suggested number of software engineers required to do the project. (2)
- iv. Calculate the total salary bill required to complete the project. (2)

### QUESTION 3

- a) Describe a risk management plan. (5)
- b) Explain the risk management process. (10)
- c) Explain what is meant by the following quality terms:
  - i. Quality assurance
  - ii. Quality systems
  - iii. Quality control
  - iv. Quality plan
  - v. TQM (10)

### QUESTION 4

- a) Time and material contract is one of the contracts that can be entered into in project management.
  - i. With the aid of an example explain the contract. (2)
  - ii. State and explain one advantage and one disadvantage of the time and material contract. (4)
- b) Explain the four stages in contract placement (8)
- c) Alfred is the manager of a software project. It is a high-risk, large and mission critical project. His client has agreed on a Project Scope Statement at the beginning of the project, but whenever the client verifies deliverables, he comes up with features that he would like to add into the product. Alfred is working with the client to find what requirements were missed in the planning stages of the project and how to plan better in the future.
  - i. Which software development model is suitable for this project? (1)
  - ii. Identify and discuss four disadvantages of using this model for developing software . (4)
  - iii. With the aid of a diagram, discuss the main phases of the model. (6)

## QUESTION 5

- a) There are some projects that will be given approval even though the costs exceed the benefits in the business case. Describe ONE example of when this might be legitimate. (5)
- b) Before any system can go-live it must be acceptance tested by the users. Explain THREE different areas that are covered during acceptance testing. (6)
- c) MSUAS Computer Club is considering an investment of \$100 000.00. The directors have identified two alternatives, A and B. the expected annual cash flows for the two alternatives are given below:

	<b>Alternative A</b>	<b>Alternative B</b>
<b>Initial Investment</b>	(100 000)	(100 000)
<b>Cash flow year 1</b>	35 000	35 000
<b>Cash flow year 2</b>	28 000	35 000
<b>Cash flow year 3</b>	32 000	35 000
<b>Cash flow year 4</b>	40 000	35 000

- i. Evaluate each of the alternatives using NPV with the required rate of return of 10%. (8)
- ii. Which alternative will you recommend based on your calculations? (2)
- iii. What is alternative B's payback period? (2)
- iv. Should the investment be made if management wants to recover the initial investment in 2 years or less? (2)

**END OF EXAMINATION**