University of Colombo, Sri Lanka

University of Colombo School of Computing

BACHELOR OF SCIENCE IN INFORMATION SYSTEMS

First Year Examination - Semester II - UCSC AY21 [held in March/April 2025]

IS1209 Information Technology Project Management

(Two (2) Hours)

Answer ALL questions

Number of Pages = 23 Number of Questions = 4

To be completed by the candidate	
Index Number:	

120

Important Instructions to candidates:	To be completed by the examiners
I. Students should answer in the medium of English language only using the space provided in this question paper. II. Note that questions appear on both sides of the paper. If a page or a part of this question paper is not printed, please inform the supervisor immediately. III. Write your index number CLEARLY on each and every page of this Question paper. IV. This paper consists of 4 questions in 23 pages (including the Cover Page).Answer ALL questions. V. Programmable Calculators and any electronic device capable of storing and retrieving text including electronic dictionaries, smart watches and mobile phones are not allowed. VI. Non-Programmable calculators are allowed VII. Do not tear off any part of this answer book. Under no circumstances may this book, used or unused, be removed from the Examination Hall by a candidate	1 2 3 4 Total

Question 1:

Suppose that you are managing a new software development project for a healthcare organization. The project aims to create a patient management system (PMS) that streamlines appointment scheduling, medical record management, and billing. As the project manager, you need to ensure proper scope management. Answer the following sub-questions related to project scope management.

(a) Identify and explain the key components of a Project Scope Statement for the PMS project.

(2 Marks)

(b) What is "scope creep", and how can it be controlled in the PMS project?

(2 Marks)

(c) Explain the difference between Product Scope and Project Scope with examples from the PMS project.

(4 Marks)

(d) What are the key tools or techniques used in Collecting Project Requirements? Explain briefly how you would apply them for this PMS project?

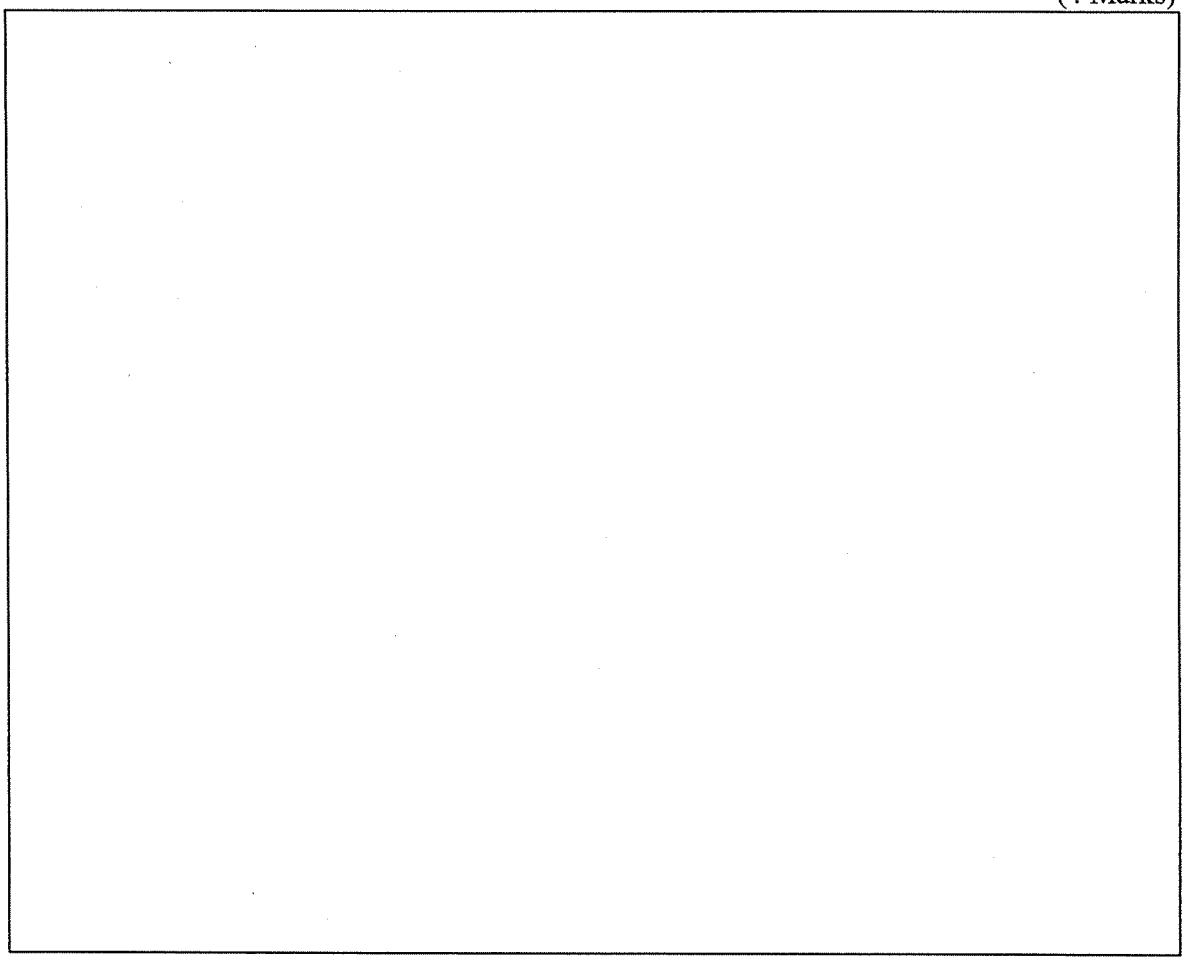
(4 Marks)

(e) Define what a Work Breakdown Structure (WBS) is, and explain the importance of it in the scope management of this PMS project?

(4 Marks)

(f) Draft a WBS for the above project at least having two (2) levels and optionally including further levels depending on the work.

(4 Marks)



Question 2:

Assume now you are going to handle the time schedules of a project and answer the following questions.

(a) What are the types of dependencies found in task schedules? Provide examples for each.

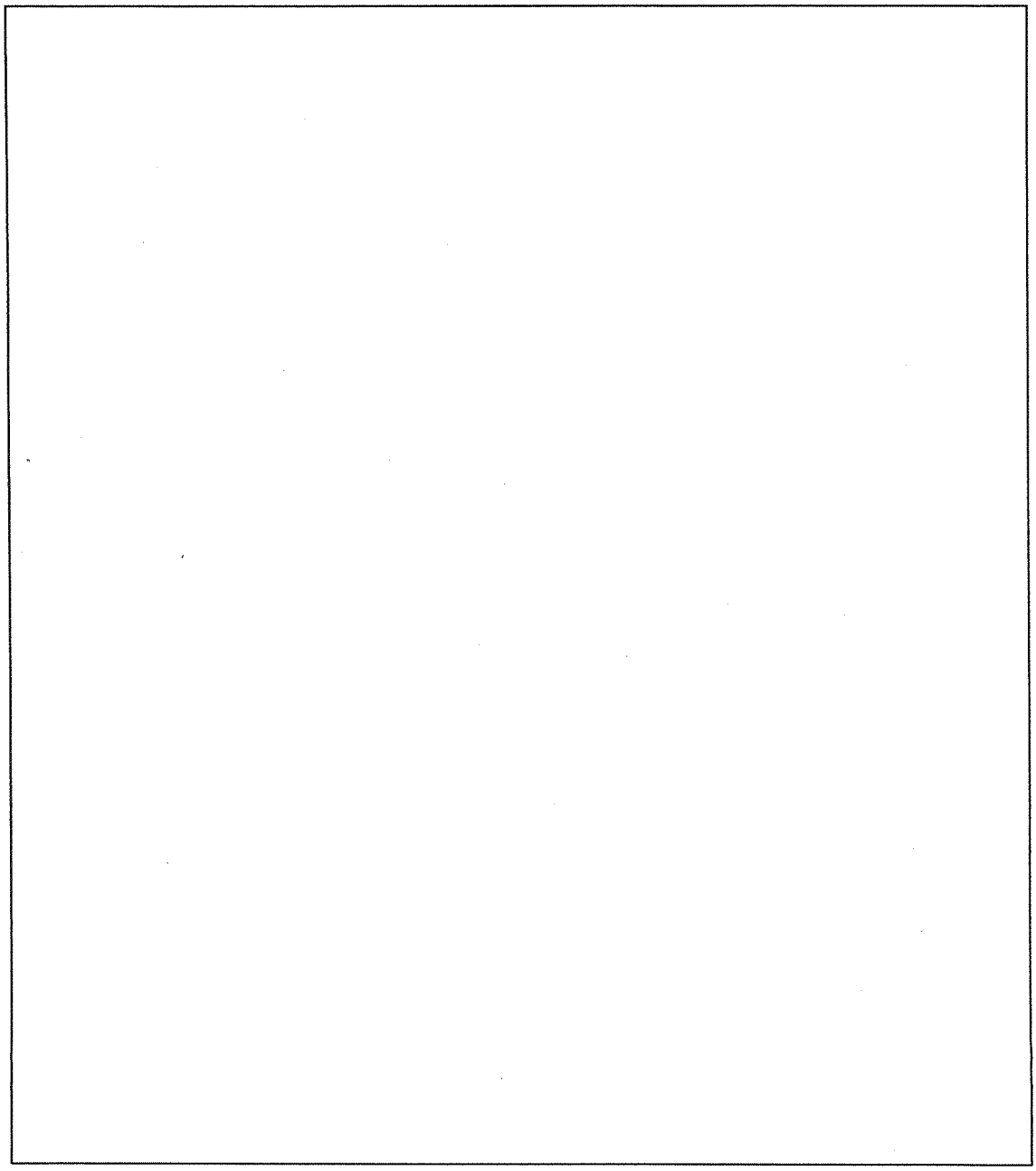
(4 Marks)

(b) Consider the following tasks listed based on a project time schedule to answer the below questions.

Task	Description	Duration (Days)	Predecessor	Dependency Type	Lag (Days)
A	Requirement Gathering	5	-	-	0
B	System Design	7	A	FS	0
C	Development	10	B	FS	2
D	Database Setup	8	B	SS	3
E	API Integration	5	C, D	FS	1
F	Testing	6	E	FS	2
G	Deployment	4	F	FS	0

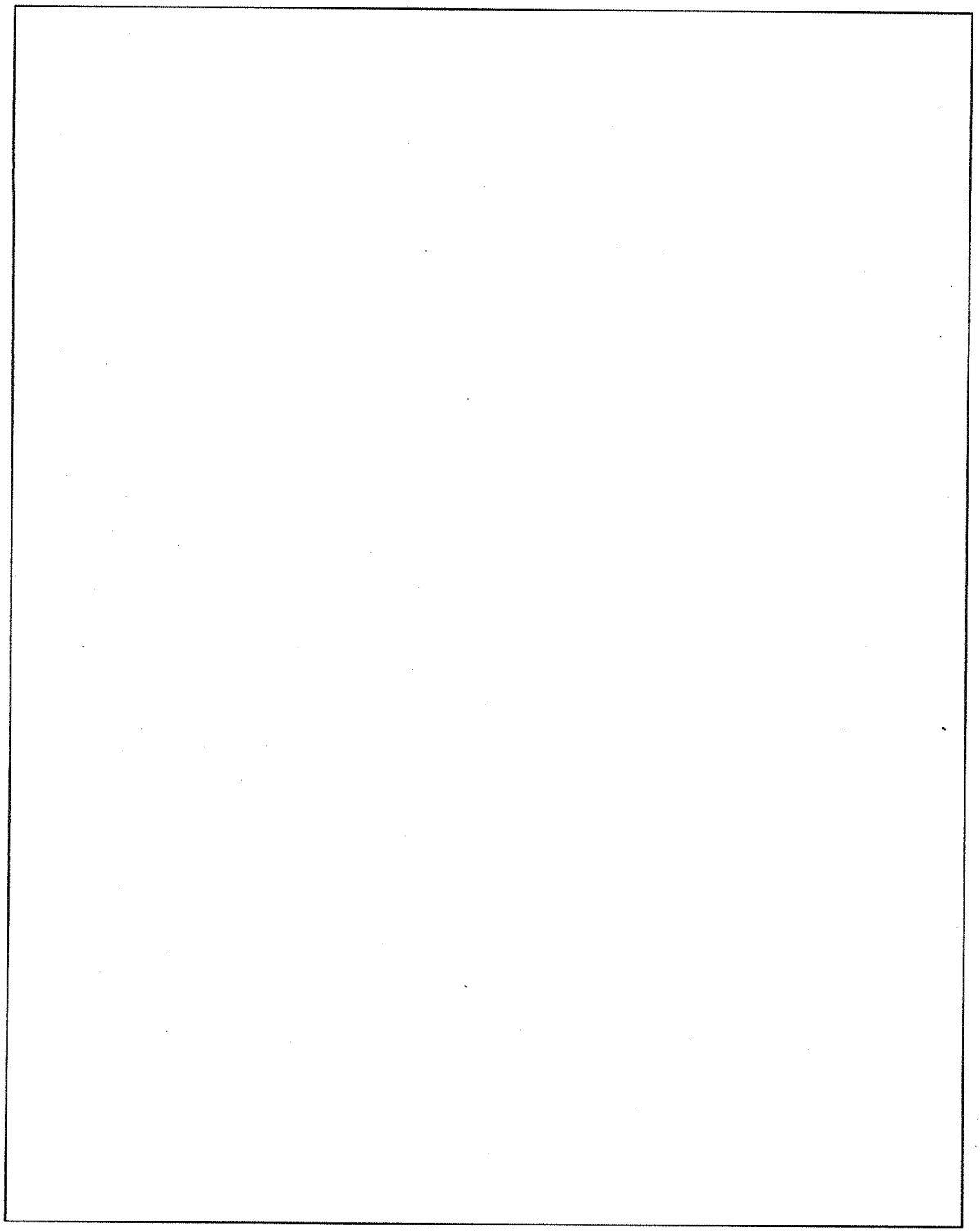
i. Draw the Gantt chart clearly showing the time and the tasks listed on the above table.

(5 Marks)



ii. Draw the PDM diagram, determine ES EF LS LF for each task and provide them on the diagram.

(5 Marks)



iii. What is the Critical path of this project?

(2 Marks)

iv. What is the duration of this project?

(2 Marks)

v. What techniques can be used to shorten the project schedule?

(2 Marks)

Question 3:

(a) Describe two (02) tools or techniques used in scheduling projects. For each tool, explain its purpose and provide an example of when it would be most useful.

(2 Marks)

(b) Define what PERT is in project management and explain how it differs from the Critical Path Method (CPM)

(2 Marks)

(c) While developing an app, midway through the project, the client insists on adding a new feature that was not part of the original scope. The team estimates this will delay the project by two weeks.

i) What steps should be taken by the project manager to handle this situation?

(2 Marks)

ii) Suggest a risk mitigation strategy for managing scope changes effectively.

(2 Marks)

(d) The following tasks and their time estimates (days) are given for an AI Healthcare project. Answer the following questions based on this information.

Task	Description	O (Optimistic)	M (Most Likely)	P (Pessimistic)	Predecessor
A	Requirement Analysis	5	7	12	-
B	System Design	10	12	18	A
C	AI Model Training	20	30	50	B
D	Frontend Development	8	10	14	B
E	Backend Development	12	15	22	C, D
F	Testing & Validation	6	8	15	E
G	Deployment	4	5	8	F

i. Calculate the Expected Time (TE) for each task using the PERT formula.

(5 Marks)

Task	Description	Expected Time
A	Requirement Analysis	
B	System Design	
C	AI Model Training	
D	Frontend Development	
E	Backend Development	
F	Testing & Validation	
G	Deployment	

ii. Calculate the Variance of each task.

(5 Marks)

Task	Description	Variance
A	Requirement Analysis	
B	System Design	
C	AI Model Training	
D	Frontend Development	
E	Backend Development	
F	Testing & Validation	
G	Deployment	

iii. Identify the Critical Path of the project and find the project completion time.

(3 Marks)

iv. If the AI Model Training (Task C) gets delayed by 5 extra days, how will it impact the project timeline?

(2 Marks)

v. If the project duration gets delayed for 10 more days, what will be the Z score that this project will be successful?

(2 Marks)

Question 4:

(a) Discuss the role of qualitative and quantitative risk analysis in project risk management with at least two (02) examples of risks that would require both types of analysis.

(4 Marks)

(b) Identify and explain the four (04) responses to negative risks (threats). For each response, give an example of how it could be applied in an IT project.

(4 Marks)

(c) Consider the following case.
During the development of an e-commerce platform, the project team identified a high-risk issue: the third-party payment gateway might not have been integrated properly due to API compatibility issues.

i) What risk response strategy would you recommend for this risk? Justify your recommendation.

(2 Marks)

ii) Outline a contingency plan for this risk.

(2 Marks)

(d) Suppose that you are managing an IT project to develop an AI-Powered Help Desk System (HDS) for an enterprise. During the risk identification phase, you identify a risk related to a system downtime event due to potential server failures. Based on historical data and expert judgment, you estimate the following:

- Probability of Risk Occurrence (P): 15% (0.15)
- Impact of Risk (I): If the system downtime occurs, it could result in a financial loss of $80,000 due to lost business, penalties, and recovery efforts.
- Cost of Mitigation (M): Implementing server redundancy and failover mechanisms would cost $10,000.

i. Determine whether it is cost-effective to implement the mitigation(M) strategy.

(4 Marks)

ii. What other risk management strategies (besides mitigation) can be applied to address system downtime risks in IT projects?

(3 Marks)

(e) Project quality management ensures that the project will satisfy the needs for which it was undertaken. Assuming you are a Project Manager, provide brief answers to the following questions.

i. What are the key processes in Quality Management in project management?

(3 Marks)

ii. Explain the difference between quality assurance and quality control.

(3 Marks)

iii. List at least two (02) types of tests that can be performed to ensure the quality of an IT project. Briefly describe each.

(2 Marks)

(f) Out of the seven basic quality tools (7QC tools) list at least four (04) tools. For each tool, explain how it can be used to improve project outcomes.

(4 Marks)

(g) A software testing team finds the following number of defects in five consecutive builds of a system:

Build	Defects
1	15
2	12
3	9
4	7
5	5

i) Calculate the defect reduction rate between Build-1 and Build-5.

(2 Marks)

ii) If the target is to reduce defects by 80% from Build-1, how many defects should be present in Build-5?

(2 Marks)

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