



University of Colombo, Sri Lanka

University of Colombo School of Computing

BACHELOR OF SCIENCE IN COMPUTER SCIENCE

BACHELOR OF SCIENCE HONOURS IN COMPUTER SCIENCE

BACHELOR OF SCIENCE HONOURS IN SOFTWARE ENGINEERING



Third Year Examination — Semester I— 2022

SCS3208 — Software Project Management

(Two (2) Hours)

Answer ALL questions

Number of Pages = 12

Number of Questions = 4

To be completed by the candidate

Index Number:

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87

Important Instructions to candidates:

- Students should answer in the medium of **English language only** using the space provided in this question paper.
- 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.
- Write your index number **CLEARLY** on each and every page of this Question paper.
- This paper consists of 4 questions in 12 pages (including the Cover Page).
- Answer **ALL** questions.
- Programmable Calculators and any electronic device capable of storing and retrieving text including electronic dictionaries, smart watches and mobile phones are **not allowed**.
- Non-Programmable** calculators are **allowed**.
- 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.

To be completed
by
the examiners

1	
2	
3	
4	
Total	

Question 1: There are 20 MCQs.

- Each MCQ has 5 (five) choices with one correct answer (Select only one option).
- Answers should be marked on the special answer sheet provided and submitted separately.
- When answering the MCQs, thoroughly read and follow the instructions given on the "Instructions to use the MCQ answer sheet" document before you shade your correct choices (See the backside of the "MCQ answer sheet").

[40 marks]

1. Which of the following **best** describes what a project is? A Project is,
 - (a.) a temporary endeavour to develop a product or deliver a service.
 - (b.) carefully planned and organized a set of activities to deliver a product or service.
 - (c.) a sequence of complex and connected activities with a clear purpose.
 - (d.) a well-organized collection of tasks to be completed on or before a specified time.
 - (e.) a series of tasks to be completed to reach a unique outcome within a pre-defined time duration.
2. Consider the following projects/activities to be conducted at the ABC company.
 - A. Transferring all data to a new database
 - B. Customizing a computer-based information system to satisfy the unique business needs
 - C. Handling customer complaints using a computer-based information system installed recently

Which of the above can be considered as (a) software project(s)?

- (a.) Only A
 - (b.) Only B
 - (c.) Only C
 - (d.) Only A and B
 - (e.) All A, B and C
3. Which of the following is NOT usually considered a project constraint?
 - (a.) Cost
 - (b.) Effort
 - (c.) Quality
 - (d.) Scope
 - (e.) Time
 4. Which of the following is NOT an agile software project management method?
 - (a.) Incremental method
 - (b.) Iterative method
 - (c.) Scrum method
 - (d.) Scrum method
 - (e.) Waterfall method
 5. Which of the following provides the correct order of processes in the project life cycle?
 - (a.) Planning, Initiating, Monitoring and Controlling, Executing, Closing
 - (b.) Initiating, Planning, Monitoring and Controlling, Executing, Closing
 - (c.) Planning, Closing, Initiating, Monitoring and Controlling, Executing
 - (d.) Initiating, Planning, Executing, Monitoring and Controlling, Closing
 - (e.) Planning, Closing, Initiating, Executing, Monitoring and Controlling

6. The correct order of activities in the initiation phase of a project is,
- Establish Project Office, Form the project team, Conduct Feasibility Study, Prepare PID, Prepare Business Case
 - Conduct Feasibility Study, Prepare Business Case, Prepare PID, Form the project team, Establish Project Office
 - Prepare the business case, Conduct Feasibility Study, Prepare PID, Form the project team, Establish Project office
 - Form the project team, Prepare PID, Conduct Feasibility Study, Prepare Business Case, Establish Project Office
 - Prepare PID, Form the project team, Establish Project Office, Conduct Feasibility Study, Prepare Business Case
7. The list of major activities of a project management office includes,
- administrative records handling.
 - assuring the quality of the deliverables.
 - communication handling.
 - disseminating project information.
 - reporting lessons learnt.
8. "Benefit Map" is a tool used at the project initiation phase. It does NOT help to,
- map the organization's business strategy with the benefits to be derived from the project outputs.
 - match the project deliverables with project objectives.
 - assure that the user requirements are met at the end of the project.
 - convince the stakeholders of what benefits the project will bring.
 - depict the alignment of project deliverables with the expected business goals.
9. Technical feasibility assessment is conducted to,
- assess whether a project fits the long-term goal of the organization.
 - evaluate individual projects against the organization's strategic plan.
 - determine opportunities, business requirements, or problems that need to be solved.
 - evaluate whether the required functionalities of the product can be achieved.
 - define how the achievement of the strategic goals will be measured.
10. Match the following cost types with suitable examples.

Types of Costs	Examples
A. Development cost	I. Costs for system upgrades
B. Operational cost	II. Staff recruitments and training costs
C. Maintenance cost	III. Software developer wages, Hardware costs
D. Setup cost	IV. System administrator wages, utility bill payments

- A-I, B-II, C-III, D-IV
- A-II, B-III, C-IV, D-I
- A-III, B-IV, C-I, D-II
- A-IV, B-I, C-II, D-III
- A-IV, B-III, C-II, D-I

TVT company has received two alternative projects: Project A and Project B. Consider the expected cash flows of each project and the discount factors at a 10% discount rate provided in the following table to answer **questions 11 to 15**.

Year	Project A	Project B	Discount factor at 10%
0	-150,000	-100,000	1
1	20,000	18,000	0.9091
2	40,000	32,000	0.8264
3	90,000	60,000	0.7513
4	100,000	80,000	0.6830

11. What is the net profit of Project B?
 - (a.) 47,500
 - (b.) 58,000
 - (c.) 90,000
 - (d.) 100,000
 - (e.) 190,000
12. What is the NPV (Present Net Value) of Project B?
 - (a.) 9,288.75
 - (b.) 10,631.65
 - (c.) 37,155.00
 - (d.) 42,526.60
 - (e.) 47,500.00
13. What is the annual ROI of Project B?
 - (a.) 18.00%
 - (b.) 20.00%
 - (c.) 22.50%
 - (d.) 66.00%
 - (e.) 90.00%
14. What is the pay-back period of Project B?
 - (a.) 2.12
 - (b.) 2.83
 - (c.) 3.00
 - (d.) 3.12
 - (e.) 4.00
15. Which of the following is CORRECT regarding Project A and Project B?
 - (a.) Project A's pay-back period is lesser than that of Project B.
 - (b.) Project A's annual ROI is larger than Project B's annual ROI.
 - (c.) Project A should be selected over Project B.
 - (d.) Project B's net profit is larger than Project A's net profit.
 - (e.) Project B should be selected over Project A.

16. An evaluation of five projects' IRR (Internal Rate of Return) values resulted in the following.
Project A = 16%, Project B = 31%, Project C = 23%, Project D = 11%, Project E = 6%
Which project would be selected?
- Project A
 - Project B
 - Project C
 - Project D
 - Project E
17. Project communication management should be taken place,
- only during the project initiation.
 - only during the project initiation and execution.
 - only during the project planning and execution.
 - only during the project initiation and closure.
 - during the whole project period.
18. Nihal is a project manager. He is managing a massive project with international collaboration. He has to communicate regularly with all of the project stakeholders. There are 42 stakeholders in this project. How many communication channels exist in this project?
- 42
 - 861
 - 903
 - 1722
 - 1764
19. Which of the following is NOT a component of a Communication Management Plan?
- Stakeholder requirements related to the project
 - Information to be communicated, including format, content, and level of detail
 - Who will receive the information, and who will produce it
 - Suggested methods or technologies for conveying the information
 - A glossary of common terminology used in communication
20. Match the following communication types with suitable descriptions.

Types of Costs	Examples
A. Push Communication	I. Exchanging information via meetings, phone calls, or videoconferencing.
B. Pull Communication	II. Information is distributed among the participants via reports, e-mails, faxes, voice mails, and other means for common understanding.
A. Interactive Communication	III. Information is sent to recipients at their request, usually in written form.

- A-I, B-II, C-III
- A-II, B-III, C-I
- A-III, B-II, C-I
- A-III, B-I, C-II
- A-I, B-III, C-II

Question 2:

- (a) Describe how a software project's Work Breakdown Structure can be created. Write down the steps to create it.

[3 marks]

- (b) Consider the list of activities given in the table below.

Task	Duration	Predecessor
A	4	-
B	5	A
C	4	B
D	4	A
E	3	B
F	2	D, E
G	7	C, F

- (i) Draw the Activity-on-Arrow (AOA) network for the activities given in the above table. Find the latest dates, earliest dates, total floats, and free floats and provide the relevant information on the nodes.

[14 marks]

Question 3:

- (a.) XYZ company has undertaken a project to be completed within a year. The project mainly depends on a data centre which is vulnerable to heavy floods. It is estimated that this year, there is only a 1 in 1000 chance of a heavy flood happening. If a flood occurred, a new server could be established for Rs.4,000,000. Find the risk exposure. Write down the formula used to find the answer.

[3 marks]

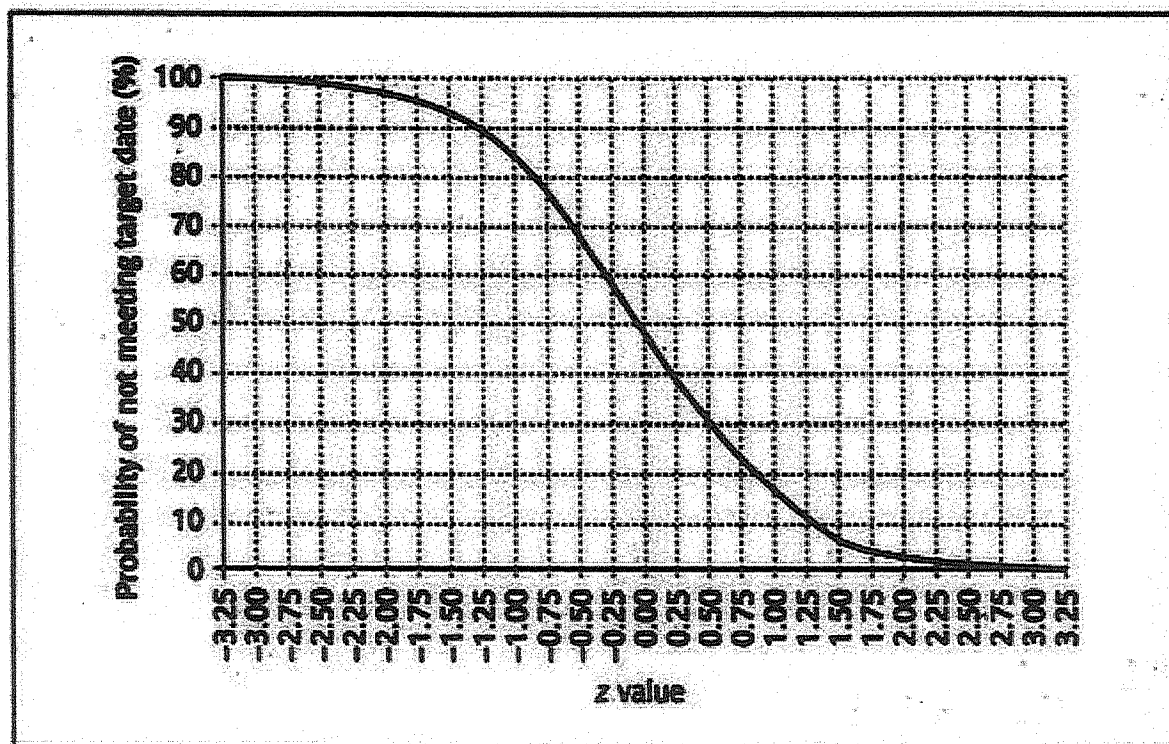
- (b.) The following table shows information about activities to be done in a project. Each activity has a risk. Therefore, the project was planned using PERT (Program Evaluation Review Technique) with three-time estimates (a, m and b) in weeks. The expected completion time of the project was determined to be 20 weeks.

Find the Expected Duration and the Standard Deviation of each activity and complete the following table.

Activity	Predecessor	Optimistic Time (a)	Most Likely Time (m)	Pessimistic Time (b)	Expected Duration (t_e)	Standard Deviation (s)
A	-	2	3	4		
B	-	4	5	6		
C	-	3	4	4		
D	A	4	5	7		
E	B	3	4	5		
F	C	4	5	7		
G	D, E, F	9	11	13		

(14 marks)

- (c.) Will this project be able to complete in 20 weeks as planned? Find the probability of missing the target date (Calculate the z value of the last node and use the following graph to find the probability of missing the target date).



(3 marks)

[illegible]

Question 4:

(a.) What are the two (2) main resource optimization techniques? Briefly explain each technique.

(4 marks)

1
2

(b.) State two (2) non-algorithmic models that are used to estimate software effort.

(2 marks)

1
2

(c.) A project requires developing an information system with the following function points (see the table below).

- (i) Consider only the average complexity weights (multipliers) given in the following table and calculate the UFP (Unadjusted Function Point) value.

Function Point (FP) type	FP count	Average complexity weight
User Inputs	30	5
User Outputs	20	10
User Inquiries	15	6
User Files	2	8
External Interfaces	4	6

(6 marks)

- (ii) Suppose there is an average degree of influence (of value =3) on each of the 14 factors in General System Characteristics (GSCs). Calculate the VAF (Value Adjustment Factor) considering the total influence of GSC.

(2 marks)

(iii) What is the Adjusted Function Point (AFP) value?

(2 marks)

(d.) Briefly describe “Earned Value Analysis (EVA)” and how it can be used in the procurement management process to select a suitable source (seller).

(4 marks)
