062

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING
EXAMINATION
REGISTRATION

UCSC

UNIVERSITY OF COLOMBO, SRI LANKA

University of Colombo School of Computing

BACHELOR OF SCIENCE IN INFORMATION SYSTEMS

Second Year Examination – Semester II – 2021

IS2108 – IT Project Management

TWO (2) HOURS

To be completed by the candidate

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Important Instructions to candidates:

1. The medium of instruction and questions is **English**.
2. Write your answers in **English**.
3. If a page or a part of this question paper is not printed, please inform the supervisor immediately.
4. Note that questions appear on both sides of the paper. If a page is not printed, please inform the supervisor immediately.
5. Write your index number on each and every page of the answer paper.
6. This paper has **4** questions on **18** pages.
7. Answer **ALL** questions. All questions carry equal marks (**25** marks).
8. Any electronic device capable of storing and retrieving text including electronic dictionaries and mobile phones are not allowed.
9. **Non-Programmable** calculators are **allowed**.

For Examiner's use only	
Question No	**Marks**
1	
2	
3	
4	
Total	

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Question 1

(a)

(i) Explain what project is and mention two (02) of its characteristics.

[02 Marks]

(ii) Explain the difference between software projects and other projects using two (02) characteristics.

[04 Marks]

(b) Briefly explain following IT project life cycle types.

[03 Marks]

i) Adaptive project life cycle

ii) Predictive project life cycle

iii) Iterative project life cycle

(c) Software development company "SoftW Pvt Ltd" recently started working on developing an autonomous vehicle system. If the product fails verification and validation tests it will cost $4000 to detect the problem, additional $2000 to fix the problem and another $6000 to assemble the system. The estimated failure rate is 3 in 40.

(i) Calculate the risk exposure for the above scenario.

[02 Marks]

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(ii) Give two (02) risk controlling methodologies and briefly explain how to control risks using them.

[03 Marks]

(d) Senior management of ABC Pvt Ltd considers investing in the most suitable software project from project A or Project B which needs initial investments of $100,000 and $150,000 respectively. Following table shows return on investments for each project for the initial three (03) years.

Year	Project A ($)	Project B ($)
1	30,000	60,000
2	45,000	89,000
3	90,000	105,000

(i) Calculate the payback period for project A.

[03 Marks]

(ii) Calculate the total Net Present Value (NPV) at the end of year 3 for each project indicating NPV values for each year. Consider discount rates for Project A and B as 15% and 25% respectively.

[06 Marks]

(iii) Clearly indicate the most suitable project to invest from Project A and B. Briefly justify your answer using the values of NPV for each project.

[02 Marks]

Question 2

(a) Write down two (02) approaches that can be used to identify project activities and briefly explain each approach.

[04 Marks]

(b) A project has the following schedule for its activities:

Activity	Duration	Precedent Activity
A	3	-
B	4	A
C	2	A
D	5	B,C,E
E	3	A
F	4	E
G	4	D,F
H	2	A
I	1	H
J	3	B,G,I

(i) Draw an activity-on-node diagram using the standard 9-partition node convention and do forward and backward passes.

[06 Marks]

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(ii) State alternative paths and the critical path/s for the above project.

[03 Marks]

(I) Alternative paths
(II) Critical path/s

(iii) Order the project activities based on the total float.

[02 Marks]

(c)

(i) Briefly explain two (02) strategies that can used to shorten the project schedule.

[02 Marks]

(ii) Briefly explain resource leveling and resource smoothing.

[02 Marks]

(d) Following is the activity schedule for a project:

Activity	Predecessor	Duration (Days)		Cost ($)	
		Normal	Crashed	Normal	Crashed
A	-	2	1	30	50
B	A	4	4	40	40
C	A	5	3	60	80
D	B,C	3	2	30	70

(i) Draw the Gantt chart for the project when activities A,B and C are crashed.

[04 Marks]

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(ii) What is the crashing cost and duration?

[02 Marks]

(I) Crashing cost
(II) Project duration after crashing

Question 3

(a) Briefly explain the following statements regarding project management and give one(01) real world example for each.

[04 Marks]

I) Parkinson's Law
II) Brooks' Law

(b) State two (02) non-algorithmic software effort estimation techniques and briefly explain each of them.

[02 Marks]

(c)

(i) Briefly explain five (05) components of benefits to a user through a software system, according to the Albrecht function point analysis.

[05 Marks]

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(ii) Assume that you are the project manager of ABC Pvt Ltd, and you are supposed to create effort estimation for a newly proposed ERP system (Project A). Following table gives related two parameters for project A and for three other previous projects B,C and D.

Project	Input	Output
A	7	4
B	5	3
C	3	6
D	4	2

Clearly indicate the most similar project to project A out of three previous projects (B, C, D) by comparing their Euclidean distances.

[06 Marks]

(c)

(i) Write down four (04) characteristics of semi-detached projects.

[02 Marks]

(ii) Assume that the project manager has estimated a traffic control software system size as 1100,000 lines of code. Average salary of a software engineer is $108,249 per year. Determine the required effort and development cost for the software project using COCOMO (Constructive Cost Model).
Note: Use following c, k values for your calculations

System type	c	k	Development time
Organic	2.4	1.05	$2.5(\text{Effort})^{0.38}$
Semi-detached	3.0	1.12	$2.5(\text{Effort})^{0.35}$
Embedded	3.6	1.20	$2.5(\text{Effort})^{0.32}$

[06 Marks]

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Question 4

(a)

(i) Write down the four (04) categories of project reporting and give one (01) example for each reporting category.

[04 Marks]

(ii) Give two (02) types of progress charts and compare and contrast between them.

[03 Marks]

(b) The Table 1 shows the budgeted cost and time while Table 2 indicates the field report at day 5 with actual cost, and time that spent for a particular project.

Activity	Duration	Predecessor	Cost per day ($)
A	2	-	200
B	3	A	300
C	4	B,D,E	45
D	1	A	230
E	2	A	400

Table 1

Activity	Actual % complete	Cost spent ($)
A	100%	450
B	50%	100
C	0	0
D	20%	60
E	35%	1000

Table 2

Activity	Week number (days)								
	1	2	3	4	5	6	7	8	9
A									
B									
C									
D									
E									

Figure 1 - Gantt chart of project

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(i) Using the above two tables calculate total values of Budgeted Cost of Work Performed (BCWP), Actual Cost of Worked Performed (ACWP) and Budgeted Cost of Work Scheduled (BCWS) for the project.

[06 Marks]

(ii) Calculate total CPI and CV values for the project. Using those values describe the current progress of the project.

[03 Marks]

(c) Briefly explain the typical software change control process.

[03 Marks]

(d)

(i) Agile is a software development methodology that has a proven record of boosting the success rate of projects. Briefly explain two (02) different types of agile methodologies.

[03 Marks]

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(ii) Briefly explain the Agile workflow.

[03 Marks]

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