

# Department of Computer Science & Engineering

University of Asia Pacific (UAP)

Program: B.Sc. in Computer Science and Engineering

**Final Examination**

**Spring 2021**

**3<sup>rd</sup> Year 1<sup>st</sup> Semester**

**Course Code: CSE 305**

**Course Title: System Analysis and Design**

**Credits: 3**

**Full Marks: 120\* (Written)**

**Duration: 2 Hours**

\* Total Marks of Final Examination: 150 (Written: 120 + Viva: 30)

## Instructions:

1. There are **Four (4)** Questions. Answer all of them. All questions are of equal value. Part marks are shown in the margins.
  2. Non-programmable calculators are allowed.
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1. a. Define Return on Investment (ROI). [5]  
b. How is ROI beneficial for an investment, explain? [10]  
c. The cost summary of business includes facilitation fees of Tk.100, 000 materials costing Tk.70, 000, salaries of staffs amounting Tk.170, 000. The total annual benefit results as Tk.460, 000. Calculate ROI. [15]
  2. Suddenly A, B, and C have come to visit D's house. As they met after a long time they wanted to enjoy their time together and decided to visit a historical place. Hence, they decided to go the historical place by Uber. Uber is the most popular 'transport service providing app' in our country. To get service using the app we need to register in the app using our location, mobile number and email address. Uber app has to collect users' information. Uber provides the services through drivers and received the payment from us. As the driver was experienced, so 'A' was satisfied with the services. So 'A' gave him positive feedback.  
  
a) Discover the purpose of the use case diagram. [5]  
b) Distinguish between the use case diagram and the class diagram. [5]  
c) Analysis and design Uber's system using use case diagram. [20]
  3. After the dullness of Covid-19, Cox's Bazar came up with a New Normal tourist place with

highly maintained Covid-19 protocols. Two friends X and Y decided to cut the boredom of the lockdown and go to Cox's Bazar as soon as the lockdown ended. Furthermore, Hotel Cox at Cox's Bazar is offering buy 1 get 1 hotel room for the students. So 'X' decided to surprise 'Y' with hotel cox reservation for them. To avail this opportunity, every student must have to register at their website. X's login information will be stored in the database. 'X' selected two rooms as of hotel's offer. After selecting everything 'X' paid the total amount with his/her credit card. This information's are all stored in the database.

- a) Differentiate between use case diagram and sequence diagram. [5]
  - b) Explain the Sequence Diagrams Notation briefly. [10]
  - c) Design a sequence diagram based on the above requirements. [15]
4. a. A planning of a customer oriented computer project is given in the following Table. Construct a Gantt chart using the data presented in the following Table. [30]

Task	Earliest start	Length	Type	Dependent on...
A. High level analysis	Week 0	1 week	Sequential	
B. Selection of hardware platform	Week 1	1 day	Sequential	A
C. Installation and commissioning of hardware	Week 1.2	2 weeks	Parallel	B
D. Detailed analysis of core modules	Week 1	2 weeks	Sequential	A
E. Detailed analysis of supporting modules	Week 3	2 weeks	Sequential	D
F. Programming of core modules	Week 3	2 weeks	Sequential	D
G. Programming of supporting modules	Week 5	3 weeks	Sequential	E
H. Quality assurance of core modules	Week 5	1 week	Sequential	F
I. Quality assurance of supporting modules	Week 8	1 week	Sequential	G
J. Core module training	Week 6	1 day	Parallel	C,H

K. Development and QA of accounting reporting	Week 5	1 week	Parallel	E
L. Development and QA of management reporting	Week 5	1 week	Parallel	E
M. Development of Management Information System	Week 6	1 week	Sequential	L
N. Detailed training	Week 9	1 week	Sequential	I, J, K, M

**OR**

b. In the following example there are seven tasks, labeled *A* through *G*. Some tasks can be done concurrently (*A* and *B*) while others cannot be done until their predecessor task is complete (*C* cannot begin until *A* is complete). Additionally, each task has three time estimates: the optimistic time estimate (*o*), the most likely or normal time estimate (*m*), and the pessimistic time estimate (*p*). Calculate the expected time (*et*) using the data of the following Table. [30]

Activity	Predecessor	Time estimates			Expected time ( <i>et</i> )
		Optimistic ( <i>o</i> )	Most likely or Normal ( <i>m</i> )	Pessimistic ( <i>p</i> )	
<i>A</i>	—	2	4	6	
<i>B</i>	—	3	5	9	
<i>C</i>	<i>A</i>	4	5	7	
<i>D</i>	<i>A</i>	4	6	10	
<i>E</i>	<i>B, C</i>	4	5	7	
<i>F</i>	<i>D</i>	3	4	8	
<i>G</i>	<i>E</i>	3	5	8	