Department of Computer Science & Engineering

University of Asia Pacific (UAP)

Program: B.Sc. in Computer Science and Engineering

Final Examination	**Spring 2020**	**3rd Year 1st 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.

1. You need to design an online exam system. There will be account for teachers and students and they both needs to login and register. Teacher can schedule an exam and set questions. Question can be of three types: mcq, short question, and broad question. Students can either type the answers or write in paper and upload the image. There will be invigilators at the time of exam. Invigilator will monitor the exam using video, and audio surveillance. Teacher can also return grades to the students using the system. **Draw the use case diagram of the online exam system.** 30

OR

Consider an ecommerce site for electronic goods. The site sells mobile, laptop, and accessories. For each item system stores its price, brand name, tag, arrival date, and other information. Customer can search and add items to cart. When customer checks out each item in the cart is processed and total price is calculated. Customer provided the billing and shipping info and place the order. System stores name, email address and other necessary information for each customer. Each customer has an account history where he can see his previous purchases and pending orders. **Draw the class diagram of the ecommerce site**. You need to show the class attributes with their visibility and relationship between classes. 30

2. You need to design a library management system. There will be account for librarians and students. Librarians can grant membership to the students. Students need to login to view the book list. Students can search for books and order books. If the books are available students will send a request, and librarians will accept the request and lend the book. Database will be updated accordingly. Librarians can also manage students accounts. Students can see his account history, pending return books, and pending payments. **Draw the dataflow diagram of the library management system.** 30

3. Consider the library management system of question 2. You need to design the use case "order books". First, a student will login and selects desired books. The student can also search for a specific keyword. System will show a list of matching books and student will select the desired ones. For each selected book, system will check if the book is available, or waiting for return from other students. If a book is available system will add it to granted list. If a book is waiting for return from other students, system will add it to waiting list and specify the approximate return date. Then system will show the granted and waiting list to the student. Finally, if the student confirms the order, librarian will lend the books of granted list to the student. **Draw the sequence diagram of the "order book" use case.** 30

4. Suppose you are scheduling a project. You have broken down your project into 10 tasks. The number of days required to complete each task and dependencies among them are given bellow. 30

Task	Required number of days	Dependencies
T1	5	
T2	10	T1
T3	5	T1
T4	10	
T5	10	T1, T3
T6	10	T2, T3
T7	10	T6
T8	10	T3, T5
T9	20	T6
T10	5	T9

Assume you have enough employees, and you can schedule tasks parallelly if there are no dependencies among them. **Draw an activity bar chart of your project schedule and determine the minimum number of days to complete the project**.