Department of Computer Science & Engineering

University of Asia Pacific (UAP)

Program: B.Sc. in Computer Science and Engineering

Final Examination **Fall 2020** **3rd Year 2nd Semester**

Course Code: CSE 321 **Course Title: Software Engineering** **Credits: 3.0**

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. Programmable calculators are allowed.

1. a. The size of the code for the project in KLOC (kilo lines of code) is last four digit of your registration number. Project manager hires developers of very low quality but a lot of experience in programming language. Calculate the effort (E) and scheduled time for development (D) according to cost drivers table for semi-detached and embedded type project. **[15]**
[If your registration number is 18101001, then KLOC will be 1001]

Table 1: Cost drivers

Cost Drivers	Very Low	Low	Nominal	High	Very High	Extra High
AEXP	1.29	1.13	1.00	0.95	0.82	0.78
LEXP	2.29	2.13	1.00	0.95		

b. A defect, which could have removed during the initial stage, is removed in a later stage.

I. How does this affect the cost? Justify every SDLC level of cost. **[10]**

II. What are the relationships between cost effect and verification process in this scenario? **[5]**

2. In pandemic times, e-commerce is one of the most-talked-about economic issues of recent times. Electronic payment (e-pay) system showed in figure is a subspecies of the payment system, which provides the process of passing online payment transactions over the internet and a significant issue for e-commerce.

Simply put - payment systems are a way to pay for goods and services with a bankcard or electronic money (cashless). The most common payment systems in Bangladesh are debit card, master card and mobile banking. To make payment through e-pay consumer may need to go authentication process. Payment gateway will ensure the user authentication security. Corresponding financial authorities will responsible for payment gateway. Finally, Bank will pay money to the merchant and complete the payment transaction.

a) List major threats related to e-pay system and describe each threat briefly. **[24]**

b) How will you prevent SQL injection attack for this e-pay system? **[6]**

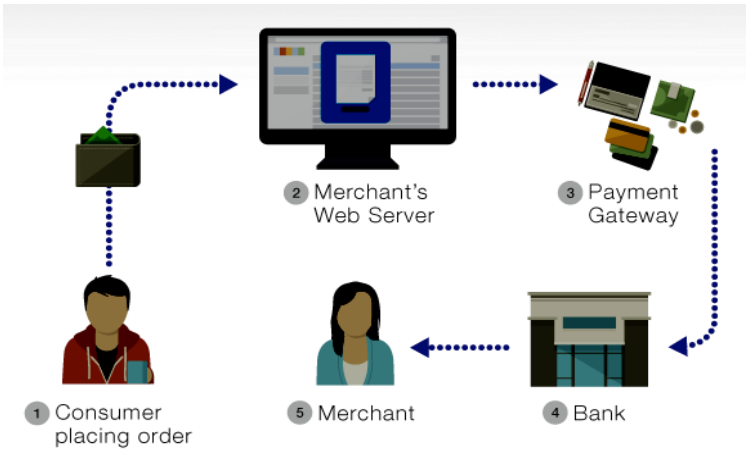

Figure 1: e-pay sytem

3. a. Explain, for re-used software development, validation is a particularly difficult process. **[15]**

   b. Under what circumstances do you think that software be re-engineered rather than re-written? **[15]**

4. Imagine you are a software architect at Central Bank Corporation (CBC). CBC runs its business with **1012** branches across the country including **4** overseas branches in United Arab Emirates and more than **20,000** employees. Computers, at the CBC have many different technologies, platforms, and operating systems. The bank has workstations and data-store-houses also. The data must be secure even if users are scattered all over the country. Some modules of the system can access only by a select group of employees at the HR department. This system includes modules such as employee administration, performance-evaluation, career path planning, training programs and payroll. You have been asked to develop a software system for managing the human resources aspect of the bank.

   a) What is the architectural solution model for the system? What is the business problem and how will you address this requirement? **[10]**

   b) Draw the architectural diagram for this business setting and describe it step-by-step. **[20]**

Or

4. You have been a software architect at First Insurance Company (FIC) for the last ten years. The FIC has offices in **30** different cities and more than **3300** employees. You have been asked to develop a software system for managing new insurance policies for your clients' staff in different industries like manufacturing, finance, textile, automobiles and IT. Each industry has different customs and requirements for managing employee benefits. Software system have to handle different industry requirements in one single system. This system can separate common requirements for all industries and specific requirements for each industry.

   a) What is the architectural solution model for the system? What is the business problem and how will you address this requirement? **[10]**

   b) Draw the architectural diagram for this business setting and describe it step-by-step. **[20]**