Date of Examination: 05/06/2021

AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

Department: Computer Science and Engineering
Program: B.Sc. in Computer Science and Engineering
Semester Final Examination: Spring 2020
Year: 3rd Semester: 2nd
Course Number: CSE3223
Course Name: Information System Design and Software Engineering

Time: 3 (Three) Hours **Full Marks: 60**

Use single answer script

Instructions:	i)	Answer script should be hand written and should be written in A4 white paper. You must submit the hard copy of this answer script to the Department when the university reopens.
	ii)	You must write the following information at the top page of each answer script: **Department:** **Program:** **Course no:** **Course Title:** **Examination:** **Semester (Session):** **Student ID:** **Signature and Date:**
	iii)	Write down Student ID, Course number and put your signature on top of every single page of the answer script.
	iv)	Write down page number at the bottom of every page of the answer script.
	v)	Upload the scan copy of your answer script in PDF format through provided **google form** at the respective course site (i.e., **google classroom)** using institutional email within the allocated time. Uploading clear and readable scan copy (uncorrupted) is your responsibility and you must cover all the pages of your answer script. However, for clear and readable scan copy of the answer script student should use only one side of a page for answering the questions.
	vi)	You must avoid **plagiarism,** maintain **academic integrity, and ethics**. You are not allowed to take any help from another individual and if taken so can result in stern disciplinary actions from the university authority.
	vii)	Marks allotted are indicated in the **right margin.**
	viii)	Necessary **charts/tables** are attached at the end of the question paper. You may use graph papers where necessary.
	ix)	Assume any reasonable data if needed.
	x)	Symbols and characters have their usual meaning.
	xi)	Before uploading, rename the PDF file as **CourseNo_StudentID.pdf** e.g., CSE3223_170204001.pdf

The answer script **(one single PDF file)** must be uploaded at designated location in the provided **Google Form link** available in the Google classroom.

There are 7 (Seven) Questions. Answer any 5(Five).

Question 1. [Marks: 12]

a) Construct a network for a project whose activities and their predecessor relationship are given in the following Table: **[8]**

Activity	A	B	C	D	E	F	G	H	I
Predecessor	-	A	B	B	C, D	D	C	A	B
Completion Time (Weeks)	2	2	3	3	4	5	5	5	7

- Construct a PERT (Program or Project Evaluation and Review Technique) network.
- Determine how many dummy activities you need to include in order to draw the network and explain why you need those dummy activities.
- Find the critical path in the network using Earliest Start (ES), Latest Start (LS), Earliest Finish (EF), Latest Finish (LF) and slack times for each activity.
- Construct the GANTT chart.

b) Draw a UML Class Diagram representing the following elements from the problem domain for a Bangladesh Premier League. **[4]**

Bangladesh Premier League is made up of at least eight cricket teams. Each cricket team is composed of eleven players, and one player captains the team. A team has a name and a record. Players have a number and a position. Cricket teams play games against each other. Each game has a score and a location. Teams are sometimes lead by a coach. A coach has a level of accreditation and several years of experience and can coach multiple teams. Coaches and players are people, and people have names and addresses.

Question 2. [Marks: 12]

a) Explain the phases of the waterfall model? Identify the problems in the waterfall model? How to solve the problems of the waterfall model? Give one real-world example for the waterfall model. **[6]**

b) Considering the following scenario, create a Class-Responsibility Collaborator (CRC) card. **[4]**

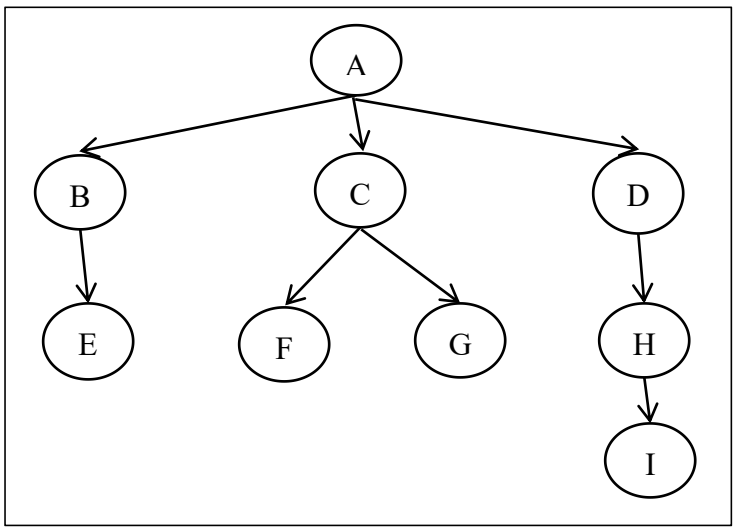
User Maik Theile buys the track "Road" from the iTunes store for 1GBP. Maik has an account with iTunes. He has enough credit to buy the track. He does not already have it in his library. Once he has purchased it, it gets downloaded to his library and his account is debited accordingly.

c) Explain the concept of regression testing with an example. **[2]**

Question 3. [Marks: 12]

a)	Examine the interview structure presented in the sequencing of the following questions: i. What kind of documents do I require to open a bank account? ii. How can I add a nominee to my account? iii. How long will it take to get my cheque book? iv. What are the charges of the debit card? v. How can I operate my account? vi. What loan am I eligible for? vii. How can I apply for a loan? viii. How do I repay the loan? ix. Could you please explain your online banking system? x. Can I send money overseas through your bank? ● What structure is being used and justified your answer. ● Rearrange the interview by changing the sequence of the questions (you may omit some if necessary). Label the reordered questions with the name of the structure you have used.	**[6]**
b)	What is the difference between alpha and beta testing? Explain with an example.	**[6]**

Question 4. [Marks: 12]

a)	Draw a sequence diagram for the following scenario: *The customer specifies an author on the search page and then press the search button. The system validate the customer's search criteria. If the author is entered, the system searches the catalog for books associated with the specific author. When the search is complete, the system displays the search result on the search result page. As an alternative path, if the customer did not enter the name of an author before pressing the search button, the system displays an error message.*	**[6]**
b)	Consider the following scenario and show how the bottom-up and top-down integration testing will be performed:  	**[4]**

c)	What is an open source software?	**[2]**
Question 5. [Marks: 12]		
a)	What is Agile? Distinguish between Extreme Programming (XP) and Adaptive Software Development (ASD).	**[6]**
b)	What is meant by project feasibility? Describe all types of project feasibilities with examples.	**[6]**
Question 6. [Marks: 12]		
a)	What are the differences between prototyping and spiral models? Explain the formal method model with an example?	**[5]**
b)	Describe SCRUM framework with necessary diagrams.	**[5]**
c)	What is verification and validation in software testing?	**[2]**
Question 7. [Marks: 12]		
a)	Draw a Data Flow Diagram (DFD) on Context Level and Level-1 for the following scenario: *Video-Rental LTD is a small video rental store. The store lends videos to customers for a fee, and purchases its videos from a local supplier.* *A customer wishing to borrow a video provides the empty box of the video they desire, their membership card, and payment – payment is always with the credit card used to open the customer account. The customer then returns the video to the store after watching it.* *If a loaned video is overdue by a day the customer's credit card is charged, and a reminder letter is sent to them. Each day after that a further card is made, and each week a reminder letter is sent. This continues until either the customer returns the video, or the charges are equal to the cost of replacing the video.* *New customers fill out a form with their personal details and credit card details, and the counter staff gives the new customer a membership card. Each new customer's form is added to the customer file.* *The local video supplier sends a list of available titles to Video-Rental LTD, who decide*	**[8]**

	whether to send them an order and payment. If an order is sent then the supplier sends the requested videos to the store. For each new video a new stock form is completed and placed in the stock file.	
b)	Identify the tangible and intangible cost from each of the following scenarios: *i) Let's examine the costs associated with a customer who has received broken merchandise and the company refund the value of the product to the customer.* *ii) If a toy company produces a toy that ends up injuring a portion of the children that play with it, that company will likely have damage to their reputation.* *iii) If you buy a new computer system for your company and ask your staff to learn the system and to adjust their work routines to the new technology.* *iv) A startup company pays their employee paychecks and also purchases some office components.*	**[4]**