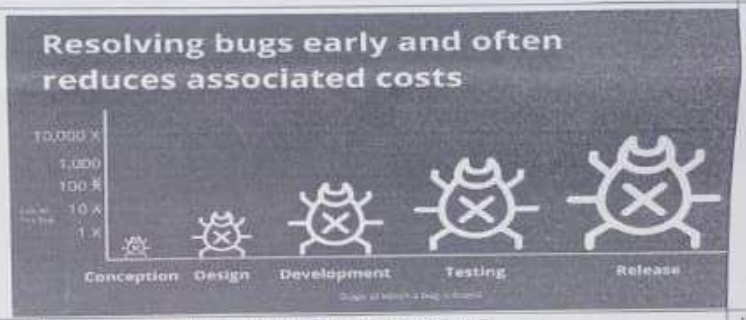
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
UNIVERSITY OF BARISHAL

FINAL EXAMINATION

Course Title: Software Engineering and Information System Design
Course Code: CSE-3103
3rd Year 1st Semester
Session: 2020-21(Admission: 2018-19)

Time: 3 Hours **Marks:** 60

(Answer any FIVE questions)

1.	a)	Write down the principles that need to be followed during Software Development life cycle.	[3]
	b)	Define agile and scrum in software engineering process model. Write down their procedures along with scenario when the processes are suitable.	[3]
	c)	What is software engineering? Is it applicable when WebApps are built? If so, how might it be modified to accommodate the unique characteristics of WebApps?	[3]
	d)	Why software project planning and tracking is necessary in software engineering?	[3]
2.	a)	What do you mean by Risk analysis and management? What steps are involved in it. Explain in details.	[3]
	b)	The requirements engineering process is accomplished through the execution of seven distinct functions. Specifically, requirements engineering encompasses requirements elicitation, analysis, specification, verification, and management. Briefly describe these processes.	[3]
	c)	Define people, process, and product. Explain the process quality and product quality in details.	[3]
	d)	Test early, test often. Prevention is better than the cure in software development. Justify your answer considering the following diagram. 	[3]
3.	a)	Define design patter. What do you mean by coupling and cohesion?	[2]
	b)	Suppose you are working on a user interface toolkit and you wish to support adding borders and scroll bars to windows. Also suppose that scroll bars on the window can be either horizontal or vertical. Now, draw the UML for the scenario and implement the code.	[4]
	c)	Avoid coupling the sender of a request to its receiver by giving more than one object a chance to handle the request. Linking the receiving objects and pass the request along the chain until an object handles it. Which design patter is used to address the scenario? Write down the UML and Implementation of the design pattern.	[4]
	d)	Why singleton design pattern is used? Write down the reasons along with its implementation.	[2]
4.	a)	What do you mean by Code Smells and Refactoring?	[2]
	b)	Write down the following code smells problems with solutions i. Feature Envy ii. Middle man iii. Shortgun Surgery iv. Refused Bequest v. Long method vi. Primitive obsession	[6]
	c)	A project has 100 nos. Regression cases 80 nos, test cases executed during regression testing. Find the percentage of test case executed.	[1]
	d)	Write down the comparisons among Black Box, White Box, and Gray Box Testing.	[3]

5.	a)	What do you mean by testing? Do you think CMMI level is necessary? Justify your answer.	[3]
	b)	Write short notes on: i. Reliability, Security, Downtime, authentication ii. Error, bugs, mistakes, and faults	[3]
	c)	Define basic path testing and test case. How to find out the cyclometric complexity.	[2]
	d)	Define project management. Write down the qualities of a good project manager.	[4]
		Do you know about GST? I think you all know about GST. It reduces the hassles of the students to travel from one university to another and costs as well. But some universities faced problems regarding open calls after the 4th or 5th migration. The main challenge was to take viva and check the documents of approximately two to three thousand students. How to solve the problem? One of the developers would like to address the problems using an ML-based image-processing application. The main idea is to register students before the open call within the range. For example, A unit (merit 2000 to 4000); B unit (merit 1500 to 2500); C unit (merit 1700 to 2700). During their registration, the system will ask for their live picture with a different angle and their signature, which they provided in their GST application. After the registration deadline, the system will learn all the registered student's pictures and signatures. On the physical appearance day, the student will appear to the system's camera and provide their signature to the signature pad of the system. Then, the system will automatically identify the students and store their attendance. The overall design of the system will eventually reduce the processing time. The system will use the same GST authentication system. Now your task is to,	
6.	a)	Briefly elaborate the overall scenario and find out the required requirements.	[3]
	b)	Determine all required activity and swimlane diagram for the system.	[4]
	c)	Draw the state and sequence diagram for the scenario.	[5]
7.	a)	Find out all possible use case for the scenario along with use case diagram.	[6]
	b)	Which type of software testing can be used to test the software with justification?	[3]
	c)	Draw required data flow diagram for the system.	[3]
8.	a)	Derive the potential classes from the user story in 6(a) with CRC class cards.	[6]
	b)	Write down all possible test cases in detail for the system.	[3]
	c)	Draw an E-R diagram for the system.	[3]