King Saud University

College of Computer and Information Sciences
Computer Science Department

Course Code:	**CSC 342**	
Course Title:	**Software Engineering**	
Semester:	**Fall 2020**	
Exercises Cover Sheet:	**Midterm 1**	**1 h 30 mn**

Student Name:	……
Student ID:	……
Department Name:	……

This exam comprises 3 exercises. Make sure you read each exercise carefully before attempting an answer. Be sure to clearly indicate your final answer for each exercise. Also, be sure to state any assumptions that you are making in your answers.

Good luck!

Exercise 1: *(6 marks)*

1. Briefly describe what each of the following types of UML diagrams are typically used for:
   i. Use case diagram: Shows interactions between roles/actors and the system.
   ii. Class diagram: Depicts a system's classes, attributes, operations and relationships

2. The critical path can be defined as the longest track through a network. The computation of the network will determine that there are:
   i. Only one critical path
   ii. One or more critical paths
   iii. Always more than one critical path
   iv. Always more than two critical paths

3. Which one of the following is a functional requirement?
   i. Maintainability
   ii. Portability
   iii. Robustness
   iv. None of the mentioned

4. Functional requirements capture the intended behavior of the system.
   i. True
   ii. False

5. Which of the following is a non-functional requirement?
   i. The system enables users to place lunch orders.
   ii. The system always responds to user clicks in less than one tenth of a second.
   iii. The system displays a list of hotel vacancies.
   iv. The system notifies the user when a new order arrives.
   v. None of the above

Exercise 2: *(5 marks)*

Suppose a large project related to the "College Registration System" is to be developed. The system has three major subsystems whose requirements are well known. The Dean of the College wants to use each subsystem once is completed.

Suggest the most appropriate software process model that might be used as a basis for managing the development of the system. Giving reasons for your choice based on the type of system being developed.

Answer:

We choose the incremental process model to develop the whole system because is composed of three subsystems and the costumer wants to use each one if its development was completed. But each subsystem must have developed using the waterfall process model because their requirements are well known.

Exercise 3: *(5 marks)*

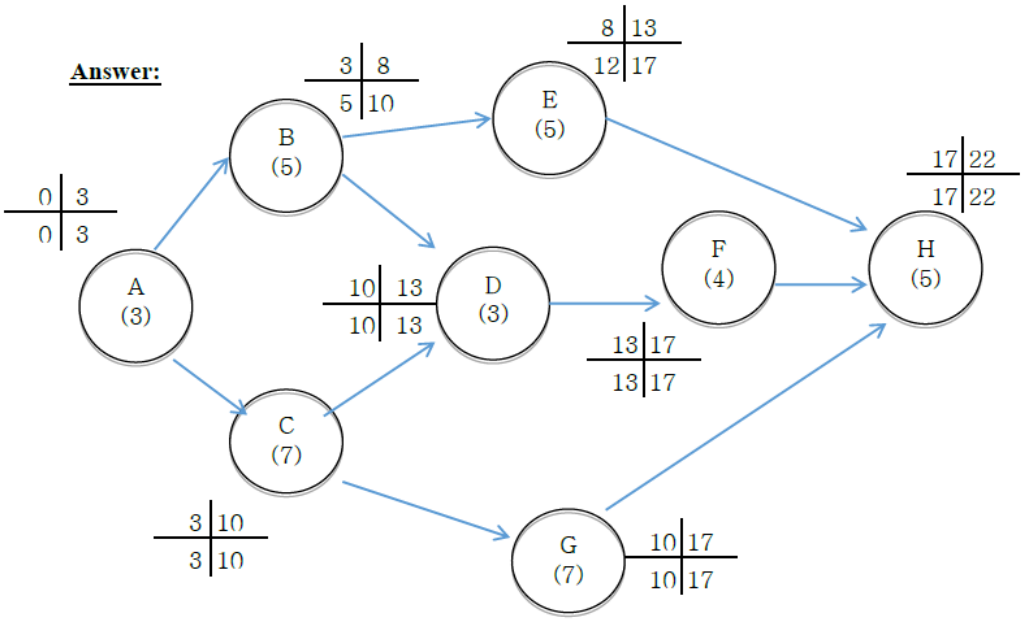
Consider a project with the following activities. Times are given in weeks.

Activity	Preceding	Time (week)
A	--	3
B	A	5
C	A	7
D	B, C	3
E	B	5
F	D	4
G	C	7
H	E, F, G	5

1. Draw the network activity diagram and find the earliest and the latest start/finish time for each activity?
2. If activity E is delayed by 5weeks, will the project completion time be affected? Justify your answer.
3. If activity F is delayed by 5weeks, will the project completion time be affected? Justify your answer.
4. Identify critical path.

Answer:

Answer:

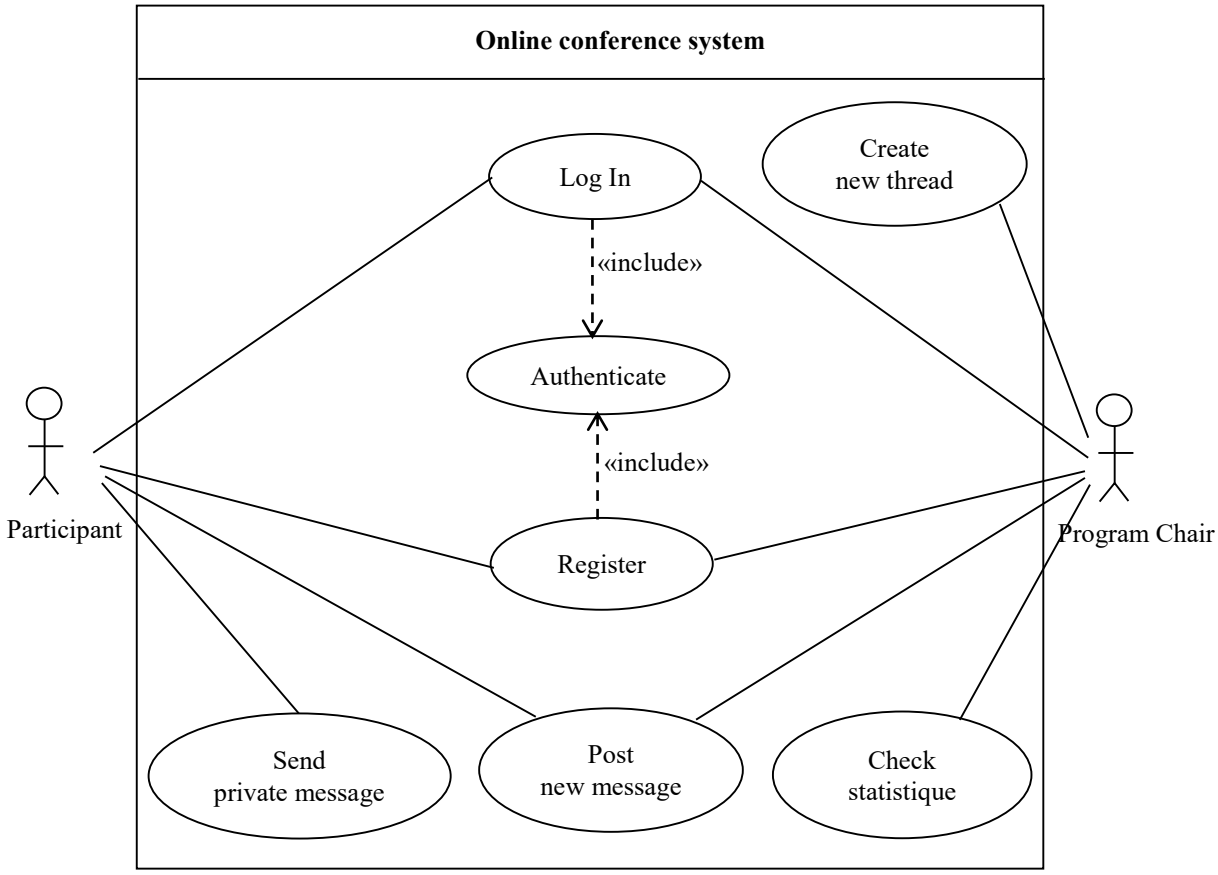


1. Yes, the project will be delayed. The slack of activity E is 4, and it can be delayed by 4 weeks without affecting the project. If it delays by more than 4 weeks the project will be delayed.
2. Yes, the project will be delayed. Activity F is part of the critical path, and any delays in activity F will affect the project.
3. There are 2 critical paths: A-C-D-F-H;; A-C-G-H

Exercise 4: *(7 marks)*

Imagine that you are analyzing requirements for an online conference system. We have two kinds of users that interact with our system with different responsibilities: Participant and Program Chair. Both can log in to the system, and part of logging in is an internal authentication process. Both can also register with the system, which also uses internal authentication. After logging in, everybody can post new messages to the board, however only Program Chair can check statistics and create new threads. Participant on the other hand can send private messages to other users, while Program Chair do not have this ability.

Draw a Use Case diagram that contains Actors, Use Cases and their relationship from the scenario described above.


Online conference system
Log In
Create
new thread
«include»
Authenticate
«include»
Participant
Program Chair
Register
Send
private message
Post
new message
Check
statistique