	<h1>King Saud University</h1> <p>College of Computer and Information Sciences Computer Science Department</p>		
	Course Code:	CSC 343	
	Course Title:	System Analysis and Design	
	Semester:	First 1445 H – Fall 2023	
Exercises Cover Sheet:	Midterm Exam	1:30 h	
Student Name:		
Student ID:		
Department Name:		

CLOs		Question No. Relevant Is Hyperlinked	Covering %	Full Mark	Student Mark
1	Knowledge and Understanding				
1.1-K1	Apply key elements and common methods for elicitation and analysis to produce a set of software requirements.	Ex-2-4-5	66.5%	10	
1.2-K2	Use necessary tools for analysis and design activities (process model, diagrams,).	Ex-3	20.0%	3	
2	Skills :				
2.1-S1	Choose an appropriate method to design the software using a software requirement specification, an accepted design methodology (e.g., structured or object-oriented), and appropriate design notation.				
2.2-S1	Use a software testing strategy.	---			
2.3-S3	Work on team and Write project reports.	---			
3	Values:				
3.1-V1	Make ethical professional decisions and practice ethical professional behavior.	Ex-1	13.5%	2	
Total			100%	15	

This exam comprises 4 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: (2 points)

Situation: A project manager is assigned to a new client who needs an e-commerce website for selling products online. After assessing the scope of work, the manager decides that three Software Engineers (Web Developers) would be sufficient, and that they will work at the client's site. The manager assigns the work to the first three people listed on the available staff sheet, knowing that each of them has less than two months' experience at the company and the list contains more experienced people as well. He just selected the first three staff members without putting the effort to trace more experienced persons from the available staff sheet.

Question: *Read the above situation carefully and answer if there is a violation of the Software Engineering Code of Ethics and Professional Practice? If yes, which principle(s) might the manager have violated? Give the reason for your choice(s).*

- a. Ensure good management for any project on which they work, including effective procedures for promotion of quality and reduction of risk.
- b. Ensure that software engineers are informed of standards before being held to them.
- c. Ensure that software engineers know the employer's policies and procedures for protecting passwords, files and information that is confidential to the employer or confidential to others.
- d. Assign work only after taking into account appropriate contributions of education and experience tempered with a desire to further that education and experience.
- e. Attract potential software engineers only by full and accurate description of the conditions of employment.
- f. Offer fair and just remuneration.

Answer:

- Answer is “a”. Manager picked the first three software engineers without spending time to search for more experience software engineers from the available staff. This can affect the quality of the product as risk of the low quality will increase with his selection.
- Answer is “d” also as the Manager did not put effort to trace more experienced people from the list.

Exercise 2: (2.5 points)

According to chapter 2, several processes are part of requirements engineering. One of them is Feasibility study: *An estimate is made of whether the identified user needs may be satisfied using current software and hardware technologies.* Name and describe three of the other processes in requirements engineering that the chapter 2 lists.

Answer:

- Requirements elicitation and analysis (1)
- Requirements specification (1)
- Requirements validation (0.5)

Exercise 3: (3 points)

1- What is a RUP (1 point)

Rational Unified Process (RUP) is a software development process for object-oriented models.

2- Cite the main phases of RUP. (1 point)

- inception
- elaboration
- construction
- transition

3- Which process model is more suitable for the development of a software which is based on the existence of a significant number of reusable components. The system development process focuses on integrating these components into a system rather than developing them from scratch. (1 point)

Reuse-oriented software engineering

Exercise 4: (3.5 points)

Decide, if following requirements are functional or non-functional (0.5 each)

	Functional	Non-Functional/Class
The system shall be usable by novice users without any prior training		✓
System shutdown in the case of a cyber-attack.	✓	
Verification email is sent to user whenever he/she registers for the first time on some software system.	✓	
A strong password might contain a certain number of characters and a capital letter.		✓
The system shall print a login prompt when the program starts up	✓	
The system shall ensure that all data is stored securely and that unauthorized access is prevented		✓
For every presented vocable the student should be able to choose “Agree”, “Neutral”, or “Disagree”.	✓	

Exercise 5: (4 points)

1. Cite at least 3 universal management activities:

- *Project planning*
- *Risk management*
- *People management*
- *Reporting*

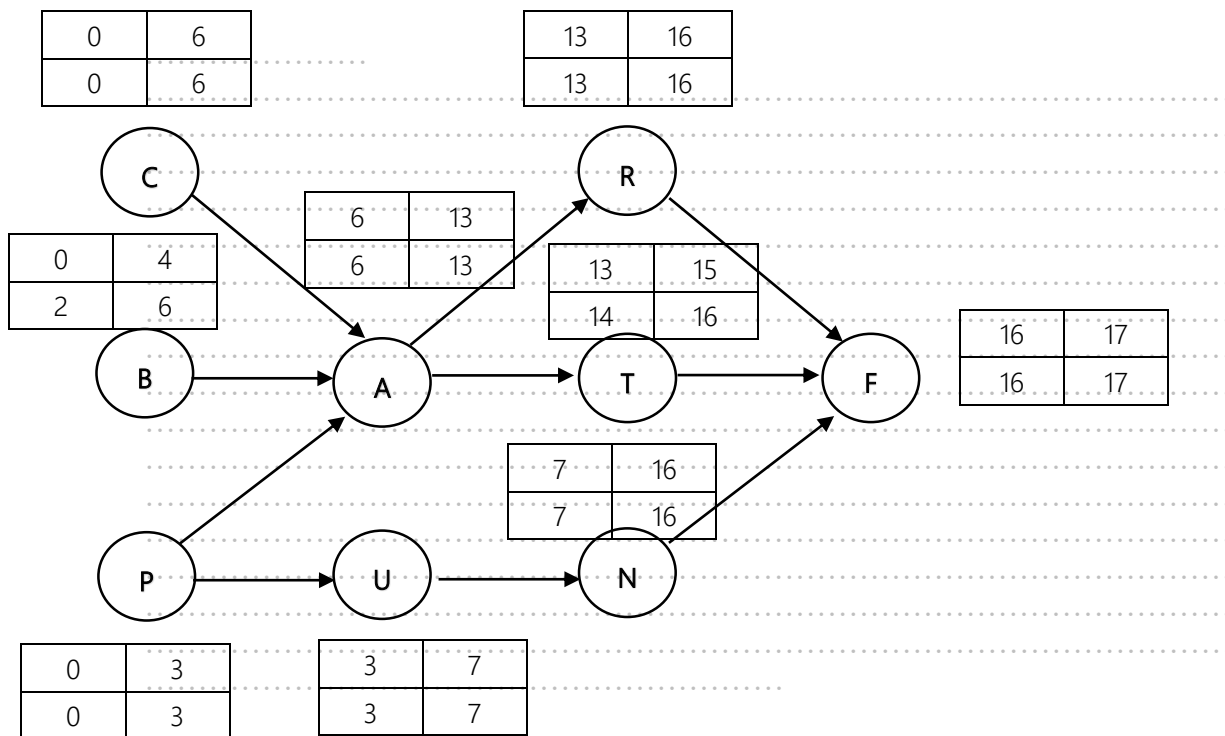
- *Proposal writing*

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

Activity	Preceding	Time (week)
C	--	6
B	--	4
P	--	3
A	B, C, P	7
U	P	4
T	A	2
R	A	3
N	U	9
F	T, R, N	1

1. Draw the network activity diagram and find the earliest and the latest start/finish time for each activity? (1)
2. Identify critical path(s). (1)
3. What is a free float? Give the free float of activity T. (0.5)
4. What is the impact to the project if activity B takes three weeks longer than planned? (0.5)
5. What is the impact to the project if activity T takes one week longer than planned? (0.5)

Answer:



2. **Critical paths:**

- CARF
- PUNF
- PARF

3. Free Float of T = $\min(\text{suc. ES}) - \text{ES} - \text{Duration} = 16 - 13 - 2 = 1$
4. If activity B takes three weeks longer than planned, the latest finish of it will be at week 7 (delayed by 1 week). This is will affect the critical task A (will be delayed by 1 week) and the final project be delayed by 1 week.
5. The free float of T = 1, then T can be delayed one week without delaying the Early Start of its successor task (F: final task). No delay of the final project.