



United International University

Department of Computer Science and Engineering

CSE 3421: Software Engineering Final : Fall 2023

Total Marks: 40 Time: 2 hours

Any examinee found adopting unfair means will be expelled from the trimester / program as per UIU disciplinary rules.

Answer all the questions. Numbers to the right of the questions denote their marks.

1. You're a proprietor of a television manufacturing company. The television can only be in two modes: on, and off. It may go from on to off if the power button is pressed. It goes from off to on similarly. Follow an appropriate design pattern and draw an UML diagram for this scenario. (8)
Later, you have decided to add surveillance mode (the front camera acts like a CCTV camera) and a constant-display mode (used to display some portraits letting the TV behave like wall art). These two features are independent and optional. You plan to add more features like these in the future. Which design pattern would you use to support this addition? Give a brief explanation.
2. (a) **Explain the Schneiderman's 8 Golden Rules** with a **suitable example** for each rule. (5)
What are these following **UI Design Components** used for: Menus, Radio Buttons, Sliders, Dialog Boxes ?
(b) **Explain** the following testing methods with a **suitable example**: (3)
 1. Dynamic Testing
 2. Regression Testing
 3. Stress Testing
3. (a) You are working on a new social media software called **Chill**. This social media platform provides you with the usual post sharing mechanism such as status, photo or video sharing. You also have a gaming section, where you can compete in competitive games with an AI or another user online. You have a market place section, where you can easily buy and sell products on your social media platform. (5)
Which **software architecture pattern** is best suited for the above scenario? **Explain the workings** of the architectural pattern with **proper reasoning**. Write **2 advantages** and **2 disadvantages** of the architectural pattern that you have selected.
(b) **Describe** the following terms: (3)
 1. SDK
 2. REST
 3. JSON
4. (a) A software company **X** is working on a project named **Y**. The developers of the project gave an estimate of 1.5 times the required cost of the necessary resources. The project schedule is also long as these developers gave schedules that are 1.5 times longer than the usual time required. The leads of the project picked the developers based on their personal preferences, notably picking someone they know personally. The employees are worked overtime, and their payments are very less compared to other software companies. (5)
Which **ethics principles** are **violated** in this scenario? **Explain** with **proper reasoning**.
(b) Why is **Docker** a **better solution** for running project application on different environments than **Virtual Machines**? Give a **proper comparison** between the two. (3)

5. (a) Find the Earliest Start, Earliest Finish, Latest Start, Latest Finish and Critical Path using the Critical Path Method for the following tasks (6)

Tasks	Duration	Precedents
A	10	-
B	5	-
C	7	B
D	9	A,B
E	6	B,D
F	10	E
G	14	D,F
H	16	-
I	13	H
J	18	I
K	12	G,J
L	10	H

- (b) Now, we are adding these entries to the table. How will you incorporate the change for the calculation? (2)

M	2	L,N
N	2	M