ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
Department of Computer Science and Engineering (CSE)

SEMESTER FINAL EXAMINATION   SUMMER SEMESTER, 2022-2023
DURATION: 3 HOURS   FULL MARKS: 150

SWE 4401: Software Requirement and Specifications

Programmable calculators are not allowed. Do not write anything on the question paper.
Answer all **4 (four)** questions. Figures in the right margin indicate full marks of questions with
corresponding COs and POs in parentheses.

1. A client intends to launch a new video sharing mobile app called "MeTube." Unlike the traditional   33
design of existing platforms like YouTube, MeTube aims to revolutionize the user experience with   (CO2)
distinct design elements and enhanced functionality on its landing page, channel page, and video   (PO2)
page. Consider the following information provided by the client:

   *"Lets start with the Landing Page. Forget static thumbnails; imagine a dynamic, interactive video
   grid where all the video's previews come alive. Videos should subtly grow or shrink based on what
   users seem to enjoy most. And for navigation, we're going beyond genres; what if we filter videos by
   mood? We could use categories like Happy, Sad, or Educational. Oh, and don't forget to integrate
   our AI assistant right there on the landing page. It should effortlessly offer suggestions based on user
   interactions, using natural language queries.*

   *Moving on to the Channel Page; we're making it modular and creator-friendly. Creators should have
   complete freedom to drag-and-drop elements like video playlists, bios, and merchandise links wher-
   ever they like on their channel page. We need real-time engagement tools too: polls, Q&As, anything
   to keep audiences involved during premieres and live streams. And how about giving creators the
   option to add ambient, dynamic backgrounds? We could let them reflect the time of day or seasons;
   anything to bring viewers closer to their favorite channels.*

   *Finally, the Video Page should be all about customization and immersion. A rigid sidebar isn't good
   enough; users should choose what related videos or playlists to show up, and even choose their pre-
   ferred layout. The comment section needs an overhaul too. Lets do a tiered system where insightful
   responses can start their own threads and get upvoted. Then there's Cinema Mode: everything but
   the video fades out, and audio settings get a boost. This way, users can immerse themselves fully in
   the content."*

   Using the requirements from the monologue above, construct a detailed wireflow illustrating the
   landing page, channel page, and video page for the MeTube app. Your wireflow should depict the
   placement and functionality of each unique feature, along with transitions and the flow between
   the different pages and their states.

2. A university is launching an application (app) tailored to the operations and services of its cafe-
teria, catering to various stakeholders within the campus community. This app is designed to
facilitate several key activities around dining services, aiming to make the cafeteria more user-
friendly and efficient.

   Users of the app include students who frequently utilize the cafeteria. They can browse daily
   menus, place orders ahead of time, and complete payments directly through the app. Additionally,
   they have the ability to review the nutritional information for each dish and provide feedback on
   their meals.

   Cafeteria staff are heavily involved with the daily operations facilitated by the app, such as updat-
   ing the menu based on availability and managing incoming orders. They also interact with user
   feedback to enhance service quality and handle the financial transactions processed through the
   app.

The app also caters to the needs of the kitchen staff, who monitor the flow of orders to manage food preparation effectively. This allows for adjustments in cooking schedules and quantities based on real-time order data.

Another group that interacts with the app is the maintenance crew. They are alerted about any technical issues within the cafeteria that require attention, ensuring that all equipment functions smoothly and efficiently.

Among the functionalities, a crucial component allows users to view the menu and link directly to ordering if they choose to do so. Furthermore, the app offers the chance for users to receive personalized promotions and discounts under certain conditions, adding a layer of interaction based on user activity and special occasions.

a) Create a use case diagram that captures the interactions and services facilitated by the app. 20 (CO2) (PO1)

b) Create four detailed personas representing users of this system, each with at least one specific special need (e.g., perceptual limitations, physical limitations, cognitive limitations, etc.). Consider these personas' goals, challenges, and motivations in their lives and how their special needs might affect their interactions. 20 (CO2) (PO2)

c) Construct a data flow diagram. 12 (CO2)

3. You are tasked with developing an Automated Laundry Management System app for your university. To ensure the app meets the needs of all stakeholders, you must conduct a comprehensive stakeholder interview. Consider various cognitive biases that might influence the process and outcome. (PO1)

a) Describe how you would identify and select stakeholders for the interview regarding the university laundry system. Explain your criteria and strategy for stakeholder selection to avoid the Status Quo Bias and Outgroup Homogeneity Bias, ensuring a diverse and representative sample of interviewees. 10 (CO1) (PO1)

b) Formulate a set of five interview questions designed to gather comprehensive information about the current laundry system's functionality, user preferences, and pain points. Include at least one question that addresses the Anchoring Bias by exploring initial expectations about the system and another that mitigates the Confirmation Bias by probing for information that might contradict common beliefs about the system's efficiency. 15 (CO3) (PO2)

c) Discuss how you would prepare the physical or virtual environment for conducting the interview to ensure comfort, confidentiality, and freedom from distractions. Highlight the importance of setting an environment that minimizes Framing Effect influences, ensuring that the way information is presented during the interview does not lead to biased responses. 8 (CO1) (PO1)

d) After conducting the interview, explain how you would analyze the data while considering biases such as the Availability Heuristic and Hindsight Bias. 7 (CO1) (PO1)

4. Imagine you are a scrum master for a software development team at a mid-sized tech company. Your team has recently completed a challenging project where you implemented a new e-commerce platform. The project, while successful, faced several hurdles that tested the team's understanding and application of Scrum methodologies.

a) During the project, the development team frequently bypassed the daily scrum due to time constraints, choosing instead to update each other informally throughout the day. Considering how this change might affect the scrum process, discuss the potential impacts on project transparency, inspection, and adaptation. 5 (CO3) (PO1)

b) The product owner introduced new features in the middle of a sprint, which led to significant changes in the sprint backlog. Analyze how this scenario aligns or conflicts with scrum principle, and suggest how the scrum master should handle such a situation to maintain the integrity of the scrum framework.

5
(CO3)
(PO3)

c) Outline a detailed plan for how you would address and rectify the deviations mentioned in Questions 4.a) and 4.b) from agile practices in future projects. Your plan should include:

15
(CO3)
(PO3)

i. Strategies for ensuring that daily meetups are held regularly and effectively, detailing how you would communicate their importance to the team.

ii. Methods for managing changes to the backlog after a iteration has commenced, ensuring that the agile principles of flexibility and rapid adaptation are balanced with the need for order and predictability.