**COMSATS University Islamabad, Lahore Campus**

**Terminal Examination FA2024**

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| Course Title: | Human Computer Interaction | | | | Course Code: | CSC356 | Credit Hours: 3(2,1) |
| Course Instructor/s: | Samia Arshad, M. Junaid Anjum | | | | Programme Name: | CS/SE | |
| Semester: | 7th | Batch: | FA21 | Section: [redacted] | Date: | 14 January 2025 | |
| Time Allowed: | 120 minutes | | | | Maximum Marks: | 50 | |
| Student Name: | [redacted] | | | | Reg. No. | [redacted] | |

**Important Instructions**

1. Attempt all questions.
2. Return the Question paper with the answer sheet.
3. Use of electronic devices will result in an F grade.

**Question 1 [CLO-1] <Understanding>** **[2.5+2.5+5=10 Marks]**

Consider the scenario and answer the questions below:

You are tasked with developing an educational tool for children with dyslexia to improve their reading and comprehension skills. The tool will include interactive features such as customizable text display options (e.g., font type, size, and background colours) and mini games to reinforce learning. These mini games will cover activities like matching words to pictures, assembling words based on their sounds, and answering simple comprehension questions after reading interactive storybooks. The tool is designed to be accessible on tablets and computers, with a clean and distraction-free interface, allowing children to use it individually or in group settings for collaborative learning.

a) Which interface type would be best suited for the above scenario?
b) Which GUI elements would you consider for the design of said tool and why?
c) Identify at least 2 interaction types that might occur during the scenario. Provide your reasoning for the identified interaction types.

**Question 2 [CLO-2] <Applying>** **[07+03 = 10 Marks]**

**Part 1:** [2.5+2.5+2=7 Marks]

In an effort to enhance student engagement and participation, a grade 5 teacher, Ahmed, noticed that traditional classroom methods were losing their effectiveness with some learners. He decided to explore whether incorporating outdoor learning activities could positively influence student engagement, teamwork, and creativity. Ahmed began his research by observing his students during outdoor activities, such as group science experiments in the school garden and team-based problem-solving games on the playground. Over the course of the second school term, he video-recorded these activities to analyse patterns of behaviour, collaboration, and

participation levels among his learners. From his observations, Ahmed noticed that a significant number of students were more engaged and willing to participate in tasks when they were conducted outside the traditional classroom environment. However, some students remained disengaged, even during outdoor activities.

Curious to understand the varying responses, Ahmed decided to conduct focus group discussions with two sets of students:

- A group of five students who showed increased engagement during outdoor activities,
- A group of five students who exhibited little to no change in their engagement levels.

Ahmed compiled his findings into a report and presented it during a school faculty meeting. The report highlighted the potential of outdoor learning to improve student engagement and proposed practical ways to incorporate such activities into the curriculum. Inspired by Ahmed's findings, the school administration decided to pilot an outdoor learning program across different grades and encouraged teachers to adopt Ahmed's strategies.

a) Based on the above scenario, which type of data gathering techniques Ahmed has incorporated, Qualitative or Quantitative? Present your reasoning.
b) Based on the above answer, during his further research, which analytical framework did Ahmed utilize for analysing or interpreting the gathered data.
c) Based on your answer to the first question, what would have Ahmed done to present his findings to the school administration.

**Part 2:** [1.5+1.5 = 3 Marks]

Consider the below products and determine which data gathering technique would be best suited:

a) A mobile application focused on mental health, offering guided meditation, mood tracking, and self-care tips tailored to users' emotional needs.
b) A web-based platform designed to help individuals and teams organize tasks, set deadlines, and track progress, featuring collaborative tools and automatic reminders.

**Question 3 [CLO-3] <Applying>** **[03+04+03 = 10 marks]**

**Scenario:**
A Ring looks like a normal ring by appearance but it is embedded with sensors, network connectivity, and software which allow us to share or exchange the data. It has intelligent technologies such as Program lock, automatic running, business card share, link share, soft voice, net file share, intelligent door lock. Every function just needs a simple finger approach. If you have that ring, then you don't need to carry credit cards, door keys, car keys, etc. By using the ring, you can pay bills without having credit cards. Also, it helps you in metro ticketing. The ring helps you to unlock your home's door Similarly, you can unlock your car by the Ring. When we connect the Ring to the smartphone; it allows making phone calls.

a) Identify the primary persona from the following personas?

**Personas:**

- A Tech-Conscious Senior Citizen who wanted to Simplify daily activities, such as managing keys and payments.
- An Eco-Conscious College Student who wanted to reduce the need for physical items like wallets, cards, and keys
- An urban professional which Streamlines daily tasks such as payments, unlocking doors, and ticketing.

**b)** Write a contextual scenario for the selected primary persona?

**c)** Write one functional, one data and one environmental requirement of this system?

**Question 4 [CLO-4] <Applying>** **[05+05 = 10 marks]**

Applying the concepts regarding evaluation of designs, for each of the scenarios below please state how you will evaluate the product/system. Also provide justification for your answer.

**Part 1:**

You are designing a personalized assistive app for autistic users that helps them complete daily routine tasks. The app adapts to individual sensory preferences and developmental needs, offering visual schedules, calming activities, and task breakdowns. You aim to evaluate whether first-time users (or their caregivers) can navigate and use the app effectively. No resource limitation for evaluation. Making use of your concepts of evaluation, please explain what evaluation technique would be suitable for this scenario and also elaborate the steps for the selected technique.

**Part 2:**

Consider a company's need to evaluate the two AI chatbots, ChatGPT and Gemini. According to research, ChatGPT is the most popular chatbot. The company needs to identify why Gemini is not as popular as ChatGPT. Making sure of the concepts of evaluation please explain how the company can plan out the comparison between the two chatbots.

**Question 5: [CLO-5] <Understanding>** **[05+05=10 Marks]**

Consider the following scenarios and provide answers to the below questions:

**Scenario:**

A smart farming system is designed to assist farmers in managing and optimizing the resources required for crop growth. The system consists of a tabletop model that visually represents the farmland, with distinct areas indicating different crops, irrigation zones, and paths for drone deployment. Physical tokens are used to represent resources such as water, fertilizer, and drones. The farmers interact with the system by placing or moving these tokens on the model to perform tasks like:

- Allocating water to specific crop areas by placing a water token in the corresponding irrigation zone.
- Applying fertilizer to areas of the field that need it, represented by a fertilizer token.

- Deploying drones for crop inspection by positioning the drone token at the desired location on the farm.

Farmers can simulate different resource management strategies and see how their decisions affect the health and yield of the crops in real-time. The system is designed to give farmers a more tangible, interactive way to experiment with their agricultural strategies before applying them to actual fields.

a) In the context of the smart farming system, how do the farmers engage with experimental cognition and reflective cognition while using the tabletop model to manage their resources? Present the respective design implications as well.
b) In the context of the smart farming system, how do the different aspects of mental models play a role in shaping farmers' interactions with the tabletop model and physical tokens?

----------Good Luck----------