00565

The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Electrical and Computer Engineering

Study Programme	: Bachelor of Software Engineering Honours Bachelor of Technology Honours
Name of the Examination	: Final Examination
Course Code and Title	**: EEI3269/EEX3269** **Introduction to Mobile Application Development**
Academic Year	: 2022/23
Date	: 31st October 2023
Time	: 0930 - 1230hrs
Duration	: **3 hours**

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of **Four (4)** questions on **Four (4)** pages.
3. This is a Closed Book Test (CBT).
4. Answer all questions and answers should be in clear handwriting.
5. Do not use red colour pen.

Question No 1 [40 Marks]

The Case for Question No 1:

OUSL BSE Degree program offers innovative technical knowledge to the students via different types of projects. In the first year, students can do the group project as a team to resolve real world problems. Sahan is one student who following this degree program and he decided to design a mobile app with his team. Especially, this app domain is targeted to the BSE degree program and that app helps to communicate among students and lecturers in the degree program. The proposed app is named ***BSE Smart Desk***. It's a smart educational app. As a preliminary stage, Sahan's team decided to collect basic requirements from their university friends. According to the lessons learned from their subjects, they have followed the mobile app development life cycle stages from the beginning. Sahan has divided tasks among all four members.

The Application simply consists of the following key areas.

- App Dashboard: Users will access a dashboard displaying course timelines, milestones, and progress indicators.
- Communication Tools: The app will include discussion forums, chat, and document sharing to facilitate real-time collaboration among students and lecturers.
- Document Repository: A document repository will allow users to upload, and access documents and all course materials.

- Notifications: The app will send notifications for task updates, milestones achieved, and announcements.

a) Before developing an educational smart mobile application, it's essential to define various types of application requirements to ensure its effectiveness and usability. List down **three** categories of application requirements.

(3 Marks)

b) In this project, Sahan listed four basic parts of mobile applications. State that identified **four** basic parts for the suggested mobile application.

(4 Marks)

c) Ruvini is one of a member of this project team. In the preliminary discussions, she suggested to develop an Android application for the project. For this project, state **two advantages** and **two disadvantages** of developing Android applications.

(4 Marks)

d) Sahan did not agree with Ruvini's suggestion. He suggested a browser-based mobile web app for the project. But other two members of the team explained the importance of a cross-platform mobile app development approach to Sahan and Ruvini. Write down **one** example of a cross-platform framework and discuss **two advantages** and **two disadvantages** of cross-platform mobile application development.

(5 Marks)

e) Sahan started mobile application UI design according to the six stages in the Design Classes. Distinguish the **five** steps of the UX design and UI design in mobile app development.

(5 Marks)

f) Once the design of the application was completed, the other two members decided to add extra User interface elements to the design. Describe the major **four** types of user interface (UI) elements that exist in mobile applications with one example for each type.

(4 Marks)

g) In the middle of the project implementation, the Supervisor of Sahan's team suggested to integrate new trending technologies and features into the App. Critically evaluate **two** trending technologies that can be integrated with the educational Mobile App.

(2 Marks)

h) At the end of the project, the team supervisor instructed them to use a White Labeling Model for their application monetization. Critically evaluate why they need to use a white labeling monetization strategy for this application.

(3 Marks)

i) You have been assigned to develop the **App dashboard** UI for the proposed app. As a team member, you are requested to fill in the blanks using appropriate React Native components against the given output. (Write down the answers in the provided answer book in the given order)

(1*10 = 10 Marks)

```
import { View, Text, StyleSheet, FlatList, {____(a)____)} from '(____(b)____)';

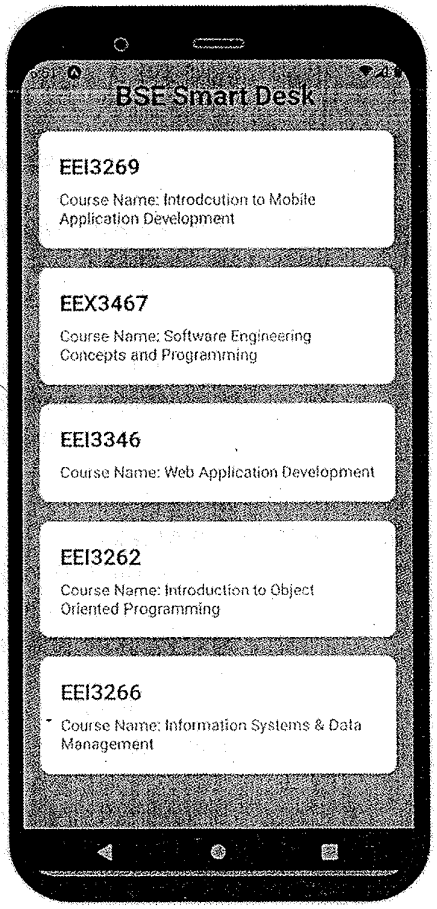
const coursesData = [
  { id: '1', courseCode: '(____(c)____)', courseName: 'Introdcution to Mobile Application Development' },
  { id: '2', courseCode: 'EEX3467', courseName: 'Software Engineering Concepts and Programming' },
  { id: '3', courseCode: 'EEI3346', courseName: 'Web Application Development' },
  { id: '4', courseCode: 'EEI3262', courseName: 'Introduction to Object Oriented Programming' },
  { id: '5', courseCode: 'EEI3266', courseName: 'Information Systems & Data Management' },
];

function DashboardPage() {
  return (
    <(____(d)____) style={styles.container}>
      <Text style={styles.title}>BSE Smart Desk</Text>

      <(____(e)____)
        data={coursesData}
        keyExtractor={(item) => item.id}
        renderItem={({ item }) => (
          <TouchableOpacity style={styles.courseItem}>
            <(____(f)____) style={styles.(____(g)____)}>{item.courseCode}</Text>
            <Text style={styles.courseName}>Course Name: {item.courseName}</Text>
          </(____(h)____)>
        )}
      />
    </View>
  );
}

const styles = (____(i)____).create({
  container: {
    flex: 1,
    justifyContent: 'center',
    alignItems: 'center',
    backgroundColor: '#9e9291',
    padding: 16,
  },
  title: {
    fontSize: 28,
    fontWeight: 'bold',
    marginBottom: 20,
    color: '#333',
  },
  courseItem: {
    backgroundColor: '#fff',
    width: '100%',
    padding: 20,
    marginBottom: 20,
    borderRadius: 10,
    shadowColor: '#000',
    shadowOpacity: 0.2,
    shadowRadius: 5,
    elevation: 3,
  },
  courseCode: {
    fontSize: 22,
    fontWeight: 'bold',
    color: '#333',
  },
  courseName: {
    fontSize: 16,
    color: '#666',
    marginTop: 8,
  },
});

export default (____(j)____);
```



Question No 2 [20 Marks]
There are several mobile operating systems on the market today.

a) What is a mobile operating system, and how does it differ from traditional desktop operating systems?

(3 Marks)

b) List **two** of the prominent mobile operating systems in use today. List down **three specific features** of each operating system.

(5 Marks)

c) The mobile operating system (mobile OS) plays a crucial role in managing the hardware and software resources of mobile devices. It performs several functions to ensure the device functions properly. Describe the above statement using **two** examples.

(6 Marks)

d) Mobile operating systems are organized into various layers that collectively manage the device's hardware and software resources. Discuss **four** main layers of a mobile operating system, along with an explanation of one main functionality of each layer.

(6 Marks)

Question No 3 [20 Marks]
Google Play Store and Apple App Store are two major application publishing stores.

a) List **three** prerequisites for publishing Android apps to the Google Play Store.

(3 Marks)

b) What is Monetization? Briefly describe the following monetizing strategies using **two** sentences.

i. Freemium Model ii. Subscriptions Model

(5 Marks)

c) What is Mobile Advertising? Briefly describe the following Key Performance Indicators using **two** sentences.

i. CTR ii. CPI

(6 Marks)

d) "Choosing a suitable partner for mobile application development is indeed a critical stage in the development process, and it can significantly impact the success of your project." Justify your answer using **five points** with examples, whether the above statement is true or false.

(6 Marks)

Question No 4 [20 Marks]

a) Briefly explain the following security mechanisms using **two** sentences.
   i. Patch App and Operating System Vulnerabilities
   ii. Encrypt mobile communication

(4 Marks)

b) How does iOS handle security and privacy compared to other mobile OSs? List **four** specific features.

(4 Marks)

c) Cross-platform development tools fall into **three** main categories. Draw a concise table to list **two advantages** and **two disadvantages** and **two examples** for each main category.

(12 Marks)