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

SEMESTER FINAL EXAMINATION **SUMMER SEMESTER, 2020-2021**

DURATION: 3 HOURS **FULL MARKS: 150**

CSE 4643: Mobile Application Development

Programmable calculators are not allowed. Do not write anything on the question paper.

There are **6 (Six)** questions. Answer **all** of them.

Marks of each question and corresponding CO and PO are written in brackets.

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1. a) Elucidate Native Applications and Hybrid Applications with appropriate examples and assess which is suited for your mobile development applications. 9 (CO1) (PO2)

   b) Answer the following questions:

   i. Despite of Android applications in Google Play Store having much more downloads than Apple applications in iOS store, why is the revenue generated by Apple app downloads much more than Android Applications? 2 (CO2) (PO2)

   ii. What components and elements should be declared in the Manifest file for any Android Application? 3 (CO2) (PO2)

   iii. What is Intent in Android Applications? Explain the different types of intents used in mobile application development. 4 (CO2) (PO1)

   c) What is API? What features do they provide? Explain them with some modern API's that we use in our day to day lives. 7 (CO2) (PO1)

2. a) Describe the SDK version relationship with appropriate examples and what measures should you take for selecting SDK version/API Levels for your application. 8 (CO2) (PO2)

   b) In Shared Storage of any android application if a user wants to store video or audio type data then the system enables which directories to store them? Will these data disappear from those directories if the application is uninstalled, if not then explain why? 8 (CO3) (PO2)

   c) Answer the following questions: 3x3

   i. "The data delay or sampling rate of Sensor Events should be set at maximum capability" – Justify this statement. (CO4) (PO2)

   ii. Why should you unregister Sensor Event Listener?

   iii. Describe the parameters that are passed while registering listeners.

3. a) Google's Voice Search require a lot of computational resources and processing power for speech processing and semantic analysis in mobile phones. Elucidate which technique is used to circumvent these shortcomings and what advantages does it offer to the users. 7 (CO3) (PO2)

   b) A finance mobile banking application named ***"Vkash"*** is gaining popularity within the general mass. This app contains features such as sending money to ***"Vkash"*** users, recharging mobile balance, paying utility bills, transferring money to bank accounts, adding money from debit/credit cards or banks, cashing out amongst many others. Before using this application, you need to register yourself using your National ID and your recent photo taken through the camera of your phone. This application requires your current location for smoothly operating various transactions. It also notifies you when a transaction is complete or if you have received money. 15 (CO4) (PO3)

   Write a Java Code requesting various permissions (by **yourself method**) for this app.

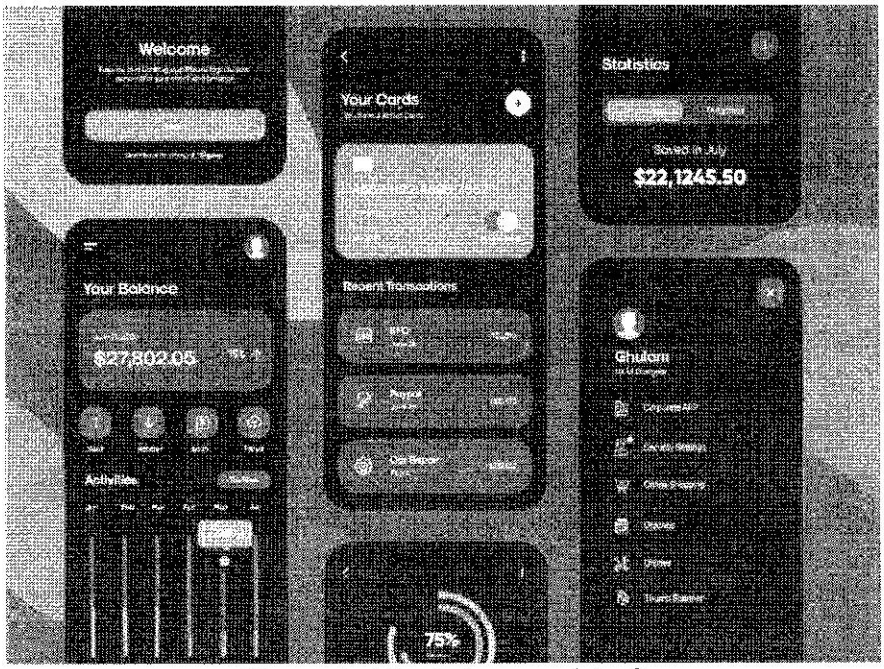

Figure 1: Vkash App user interface

c) Briefly explain a workaround the App permissions with an example. 3 (CO4) (PO1)

4. a) Is it suitable to use App Specific storage for storing pictures? Give your opinion. 5 (CO3) (PO2)

b) Explain the workflow of requesting permissions in Android Mobile Applications with appropriate diagrams and an example. 10 (CO4) (PO1)

c) Describe some of the challenges you faced while developing your application for the course ***"CSE 4644"*** that is in line with standard mobile application development challenges. 10 (CO5) (PO2)

5. a) Describe the different parameters on which you should rely to select a storage type for your application. 5 (CO3) (PO2)

b) You have an app named ***"Gambare"*** which you developed by yourself. This app has a special button which generates a file ***"Cicada"***. You want to store a cryptic message in this file whenever you click the button. Write the Java codes for the following: 5+10 (CO3) (PO3)

i. Store the string ***"Your_ID_Number's birthday will be celebrated at Yokohama on Your_brith_date"*** in your file ***"Cicada"***. For instance, **"154419's birthday will be celebrated at Yokohama on 3rd January, 2022"**. Use different string variables to store your name and birthdate.

ii. Access the file ***"Cicada"*** and check if the file contains the string you stored. If the match is found then print the **matched string** in the ***Android console*** or else print ***"Match not found"***.

c) Why is the Data Access Object an interface/abstract class? Briefly describe the design behind this model. 5 (CO4) (PO3)

6. a) The callback methods that are exposed through the SensorEventListener method invokes the onAccuracyChanged() and onSensorChanged() methods. 8 (CO4) (PO1)

```
@Override
Public final void onAccuracyChanged(Sensor sensor, int accuracy){
//Access Sensor capabilities
}

@Override
Public final void onSensorChanged(SensorEvent event){
//Access SensorEvent information
}
```

Code Snippet 1: Code Template for question 6.a)

Describe the **Sensor capabilities** from code snippet 1 that can be accessed via the Sensor class when the onAccuracyChanged method is triggered along with the **SensorEvent information** that is available if the onSensorChanged() method is invoked.

b) Two entities named ***"Otaku" and "Anime_list"*** of the ***Room Database*** is provided. An otaku only has a single anime list. These entities represent the following tables in the database as shown in Figure 2.1 and Figure 2.2. A Data Access Object (DAO) as ***MyAnimelist*** is defined for this database. Using the Room Components write the following Java codes. 3+4+5 (CO3) (PO2)

Otaku
• **otakuID (primary key)** • **f_name (first name)** • **l_name (last name)** • **favoriteAnime**

Figure 2.1: Otaku Entity

Anime_List
• **animelistID (primary key)** • **otakuCreatorID (same as otakuID)** • **animelistName**

Figure 2.2: Anime_list Entity

i. Create the Entity Class for Otaku and Anime_List separately.
ii. Write a DAO query for displaying the otakuID & animelistID whose favorite anime is **"Tonikaku kawai"**.
iii. Write a DAO query for displaying otakuID, f_name, animelistID and animelistName where the **length of the string of animelistName is greater or equal to the average length of the string favoriteAnime**.

c) What is software-based sensors? Elucidate these sensor types with two examples. 5 (CO4) (PO1)