[This question paper contains ***Seven*** printed pages]

BSc(IT)/2021/IV/F/ITW202/I **Student No: .....**

Semester End Examination, Spring 2021
Royal University of Bhutan
Gyalpozhing College of Information Technology
BSc in Information Technology - Year II, Semester II
ITW202 : Mobile Application

Time: 3 Hours **Max. Marks: 50**

Write your Student number on the top immediately on receipt of this question paper. All questions are compulsory, and marks are given at the end of each question. Parts of a question should be answered together. Spend the first 10 minutes in reading the questions.

PART A **[5]**
Multiple Choice Questions **[5 x 0.5 = 2.5]**

Q1) What is a system broadcast?

A. A message that your app sends and receives when an event of interest occurs in the app.
B. A message that is sent from an app to a different component of the same app.
C. A message that the Android system sends when a system event occurs.
D. A message that the Android system receives when an event of interest occurs in your app.

Q2) When the user rotates the device, how do AsyncTask and AsyncTaskLoader behave differently if they are in the process of running a task in the background?

A. A running AsyncTask becomes disconnected from the activity, but keeps running. A running AsyncTaskLoader becomes disconnected from the activity and stops running, preserving system resources.
B. A running AsyncTask becomes disconnected from the activity and stops running, preserving system resources. A running AsyncTaskLoader automatically restarts execution of its task from the beginning. The activity displays the results.
C. A running AsyncTask becomes disconnected from the activity, but keeps running. A running AsyncTaskLoader automatically reconnects to the activity after the device rotation. The activity displays the results.

Q3) Which steps do you perform to test a View interaction, and in what order? Choose one:

A. Match a View, assert and verify the result, and perform an action.
B. Match a View, perform an action, and assert and verify the result.
C. Perform an action, match a view, and assert and verify the result.
D. Perform an action, and assert and verify the result.

Q4) Which folder would hold the strings.xml file for translation into French for Canada? Choose one:

A. res/values-fr-rFR/
B. res/values-ca-rFR/
C. res/values-fr-rCA/
D. res/values-en-rFR/

Q5) Which of the following statements about a RecyclerView is false? Choose one.

A. A RecyclerView is a more resource-efficient way to display scrollable lists.
B. You need to provide a layout for just one item of the list.
C. All list items look the same.
D. You don't need a layout manager with a RecyclerView to handle the hierarchy and layout of View elements.

Fill in the blanks **[5 x 0.5 = 2.5]**

Q6) ..... method in a SharedPreferences.Editor object is used to remove all the data stored in the preferences.

Q7) To process the incoming Intent associated with a broadcast, you subclass the ..... class and implement .....

Q8) ..... runs on the UI thread after the background computation is finished..

Q9) ..... annotation is used to mark a method as an actual test.

PART B **[5 x 3 = 15]**

Q1) If an AsyncTask is defined as follows: **[3]**

private class DownloadFilesTask extends AsyncTask<URL, Integer, Long>

A. What is the type of the value that is passed to **doInBackground()** in the AsyncTask?

B. What is the type of the value that is passed to the callback that reports the progress of the task?

C. What is the type of the value that is passed to the callback that is executed when the task completes?

Q2) Explain **three** reasons on why Mobile Applications? **[3]**

Q3) **Operating system, Screen size and orientation, and Connectivity** issues are three of the app design issues. Explain them **[3]**

Q4) Write down the **differences** between Native apps and Cross-platform apps with an example? **[3]**

Q5) Explain **why** size of the APK matters? **[3]**

PART C **[30]**

Q1) Draw Activity state and callback graph in android. **[5]**

Q2) Two methods **size and toString** are implemented in an Arraylist class(Figure 1). Create a **Unit test** class named **ArrayListUnitTesting.java** and implement the testing. **[5]**

ArrayList.java ArrayListUnitTesting.java

```java
public class ArrayList{
    int[] arr;
    int size;
    public ArrayList(){
        arr = {1,5,6,7};
        size = 4;
    }
    public int size(){
        return size;
    }
    public String toString(){
        String str="";
        for (int i=0;i<size ;i++ ) {
            str+=arr[i]+", ";
        }
        str=str.substring(0,str.length()-2);
        str="["+str+"]";
        return str;
    }
```

Figure 1: ArrayList.java

Q3) Implement the implicit intent for sharing the text in android. The layout sample is attached in Figure 2. You can have one xml file and one java file for this. Hardcode the strings. **[5]**

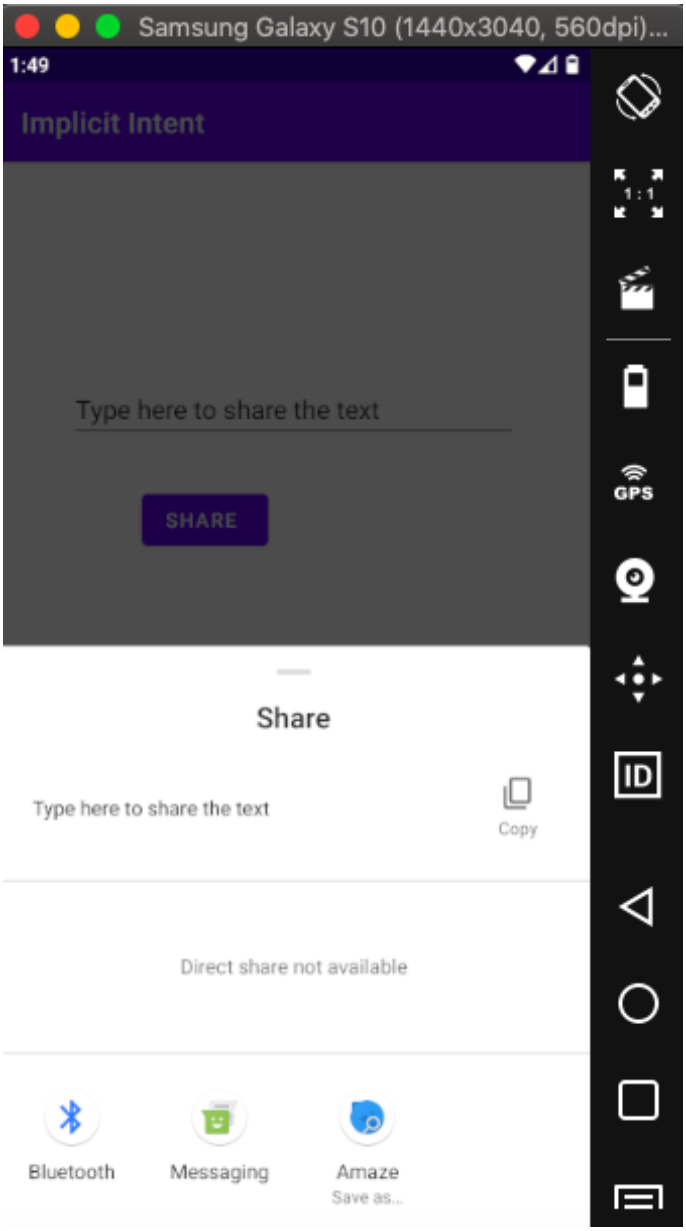

Figure 2: Implicit Intent: Sharing

Q4) The **Overflow Optional Menu** is shown in the given figure 3. Implement only the **menu_main.xml** to show the menus item with its properties. **[5]**

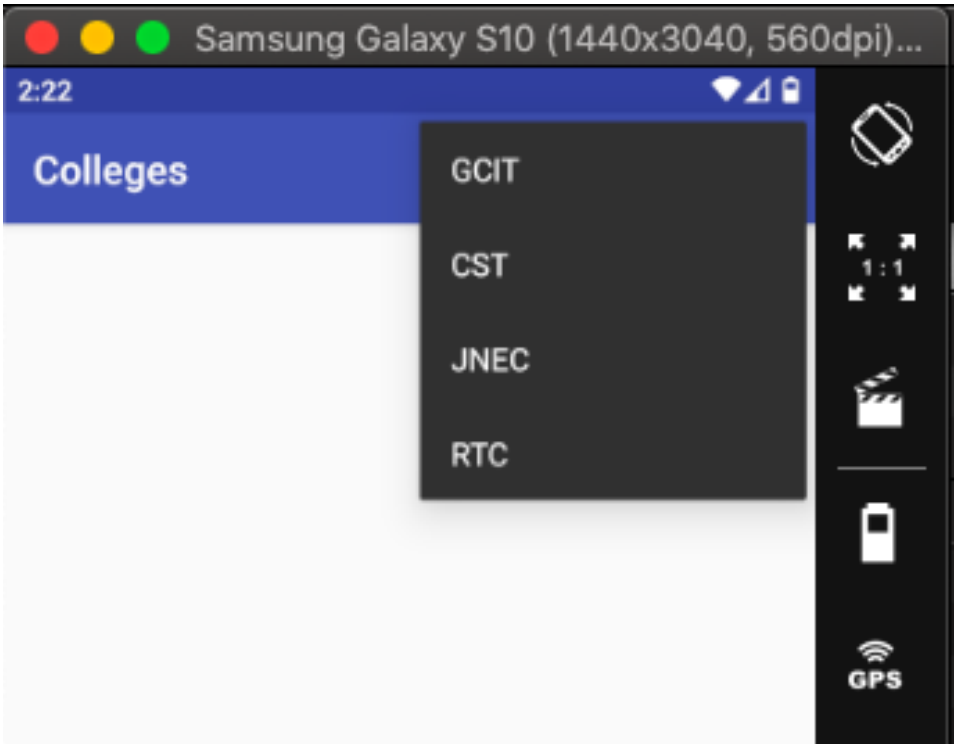

Figure 3: Overflow optional menu

Q5) You will build an app(Figure 4 and Figure 5) that contains an EditText and a Button. **[10]**

- The user enters the name of the book in the EditText and taps the button.
- The button executes an AsyncTask that queries the Google Books API to find the author and title of the book the user is looking for.
- The results are retrieved and displayed in a TextView below the button

  Implement the internet connection in worker thread. The details of bookAPI are given below:
- **BOOK_BASE_URL = "https://www.googleapis.com/books/v1/volumes?";**
- **QUERY_PARAM = "q";**
- **MAX_RESULTS = "maxResults";**
- **PRINT_TYPE = "printType";**
- **Note: No need to check network availability.**

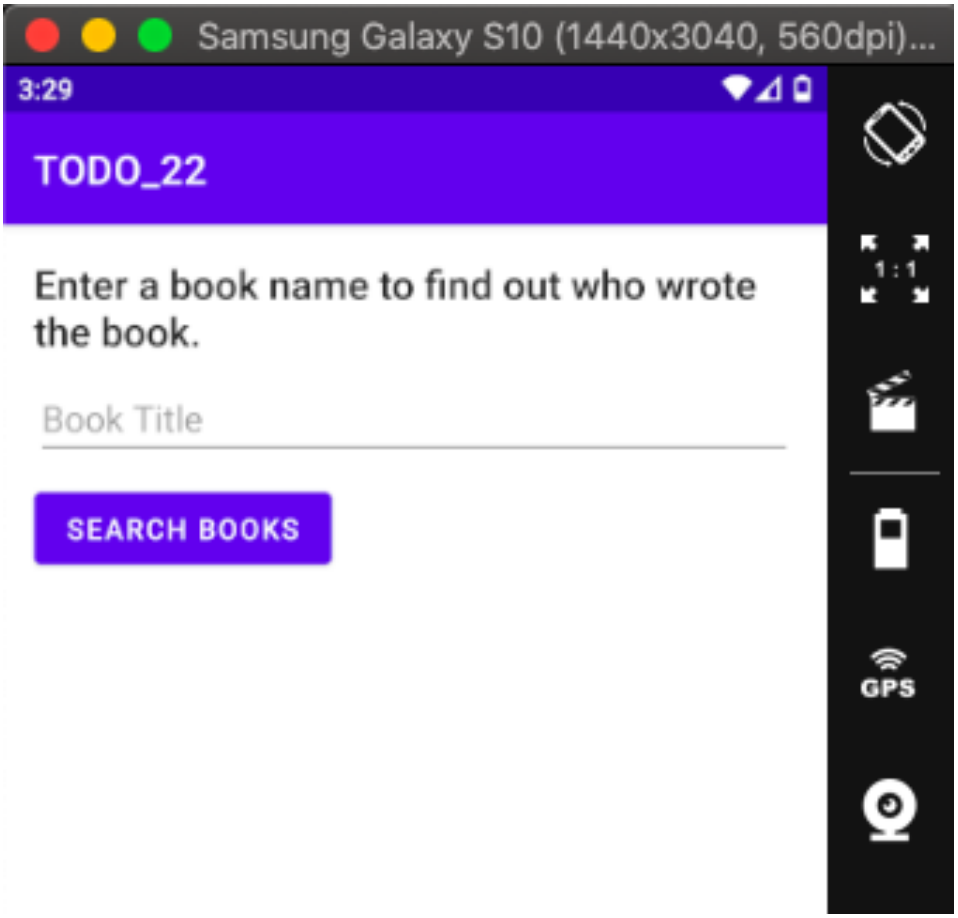

Figure 4: BookAPI_I

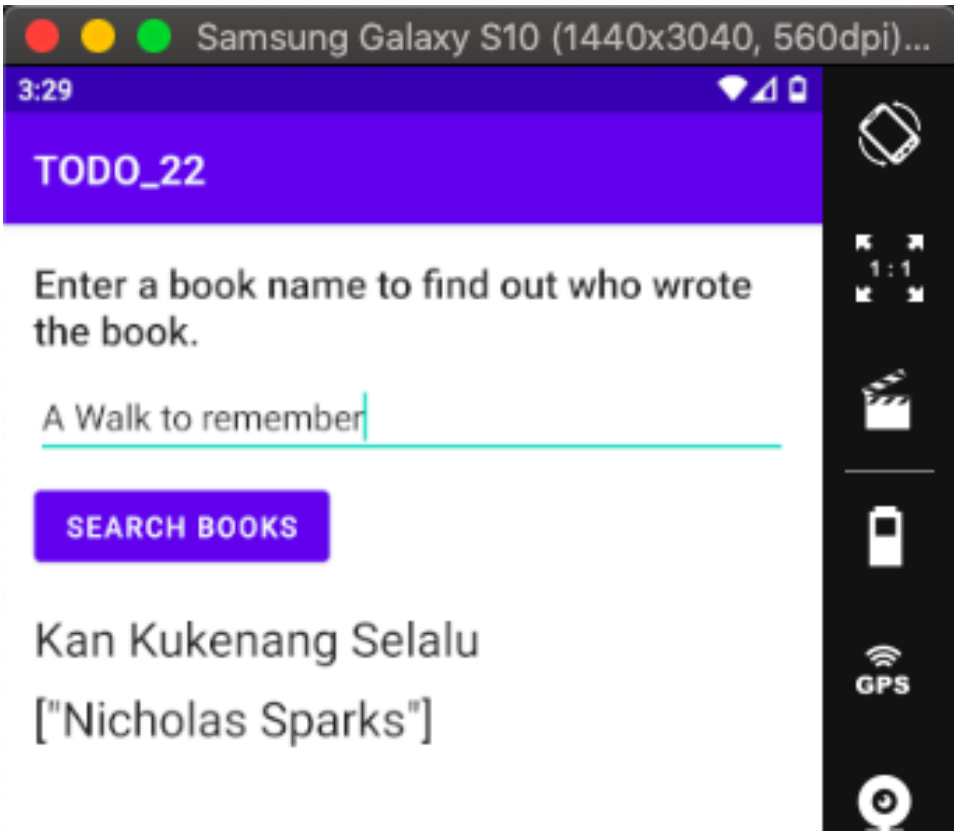

Figure 5: BookAPI_ii