



Sri Lanka Institute of Information Technology

B.Sc. Honours Degree in Information Technology
Specialized in Software Engineering

Final Examination
Year 2, Semester I (2022)

IT2010 – Mobile Application Development

Duration: 2 Hours

June 2022

Instructions to Candidates:

- ◆ This paper has 4 questions.
- ◆ Answer all questions in the given spaces on this paper.
- ◆ The total mark for this paper is 100.
- ◆ This paper contains 16 pages, including the cover page.
- ◆ Candidate is allowed to refer to the starter project open with either Android Studio or Notepad or Notepad++ **if necessary, not compulsory.**
- ◆ Candidate is given extra 10 minutes before starting the exam to open the project and read the questions.
- ◆ Electronic devices capable of storing and retrieving text, including calculators and mobile phones are not allowed.

The “YouHealth” pharmacy is available with their services online to their customers with an Android mobile app. The mobile app has the following features.

- An Admin can add new pharmacies.
- Customers can View available pharmacies.
- Customers can select a pharmacy from pharmacies list and make an order for drugs.
- Customer can do payments for the order.

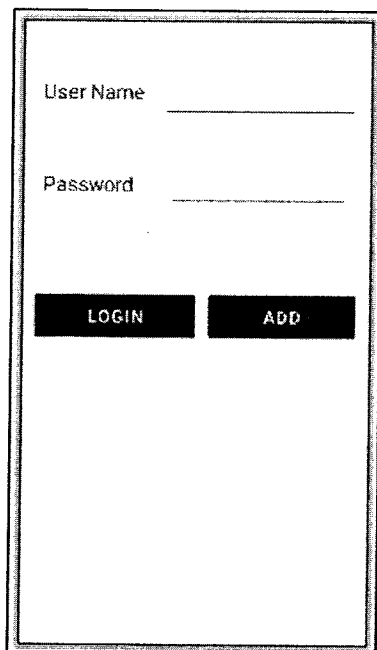
The following questions are based on the above scenario. Answer all questions in the given spaces.

Question 01 – LoginActivity

(20 marks)

The following Activity is designed to do the following.

Note: Database related functions are written in Database.java class. addInfo() function in Database.java class is written to add new user and readInfo() function is written to read all users and return Boolean true if the entered user exists in the database.



The image shows a screenshot of an Android application's LoginActivity. It features a white background with a black border. At the top, there are two input fields: "User Name" and "Password", each followed by a horizontal line for text entry. Below these fields, there are two black buttons with white text: "LOGIN" on the left and "ADD" on the right.

- a) Username and password should be aligned with their dedicated text fields to be appeared in a same horizontal line. Which constraint do you need to make for this? (2 marks)

- b) Once the user enters a username and password and click on Add button, it will add the user if he /she is not available in the database. Fill in the blanks to complete the button click event of Add button.

```
add.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {

        if (TextUtils.isEmpty(uName.getText().toString()) || TextUtils.isEmpty(uPass.getText().toString())) {
            Toast.makeText(context Login.this, text "Please insert name and password!", Toast.LENGTH_LONG).show();
        } else if (db.readInfo(uName.getText().toString(), uPass.getText().toString()) == true) {
            Toast.makeText(context Login.this, text "Data Already Exist!", Toast.LENGTH_LONG).show();
        } else {
            boolean isInserted = db.addInfo(uName.getText().toString(), uPass.getText().toString());

            if ( i.  )
                Toast.makeText(context Login.this, text "Data Inserted!", Toast.LENGTH_LONG).show();
                ii. 
            } else {
                Toast.makeText(context Login.this, text "Couldn't Inserted!", Toast.LENGTH_LONG).show();
            }
        }
    }
});
```

- i. Write the statement to fill in the blank with correct If condition. (2 marks)

- ii. Write the statements to fill this space marked as (ii) to clear the username and password data fields after successfully inserting them into the database. (2 marks * 2 = 4 marks)

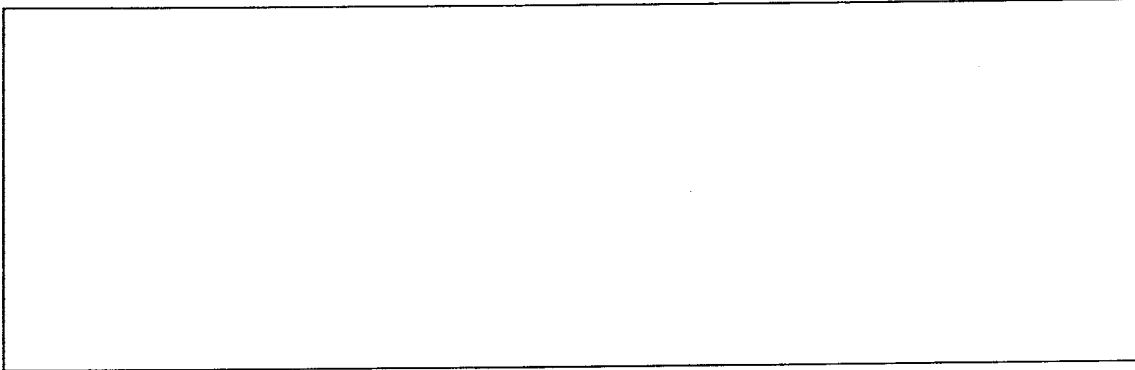
- c) If the entered details are available in the database and user clicks on the Login button, he/she will be redirected to the "AddNewPharmacy" layout. Complete the following code itself to fulfill the above requirement. (4 marks)

```
signin.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {

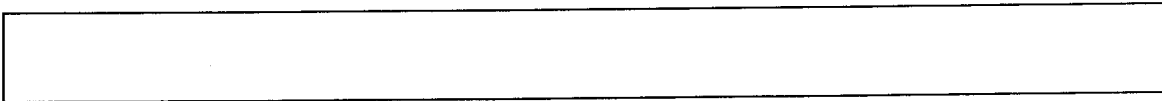
        if (TextUtils.isEmpty(uName.getText().toString()) || TextUtils.isEmpty(uPass.getText().toString())) {
            Toast.makeText(context Login.this, text "No Input!", Toast.LENGTH_LONG).show();
        } else {
            ;
            if (db.readInfo(uName.getText().toString(), uPass.getText().toString()) == true) {
                Toast.makeText(context Login.this, text "Exist!", Toast.LENGTH_LONG).show();
                
            } else {
                Toast.makeText(context Login.this, text "Doesn't Exist!", Toast.LENGTH_LONG).show();
            }
        }
    }
});
```

- d) With a later version of the application, assume that you are required to insert an image of the user when adding a new user (Note: The image will be selected from the phone gallery). The image should be added at the center of the screen. As the developer, you are responsible to develop this requirement along with the particular design changes. Assume that the layout is designed on a ConstraintLayout.

- i. Briefly explain the design process you will follow to do this. (5 marks)



- ii. Assume that a sample image should be appeared by default when you demonstrate it to your client. So that you are going to add an image as a project asset and add it to the image view. Write the correct XML code snippet to set the image named as "user.png". (3 marks)



Question 02 –AddNewPharmacyActivity**(15 marks)**

The admin is able to view all available pharmacies and add a new pharmacy name from the following layout. Answer the following questions based on this.

The screenshot shows a vertical list of 11 items. Each item consists of a main label 'Item 1' through 'Item 11' and a sub-label 'Sub Item 1' through 'Sub Item 11'. The items are separated by horizontal lines. At the bottom of the screen, there is a text input field with the placeholder text 'Enter Pharmacy Name' and a button labeled 'Add'.

a) What are the different UI elements you have to use to design this layout?

(4 marks)

b) “Enter Pharmacy Name” should be included in the Strings.xml file as a string resource value. Write the correct code snippet to be added in the Strings.xml file.

(2 marks)

- c) The above mentioned value should be retrieved as the hint appeared as "Enter Pharmacy Name" to the correct UI element attribute. Write the correct XML code snippet in the following. (2 marks)

- d) All registered pharmacies are saved in Pharmacies table in the database. viewData() function in the server end includes the SQLite query and is written to read all pharmacies and return them as follows.

```
public Cursor viewData(){
    SQLiteDatabase db=this.getReadableDatabase();
    String query= "Select * from "+DB_TABLE;
    Cursor cursor=db.rawQuery(query, selectionArgs: null);

    return cursor;
}
```

Select the correct order of code lines to complete the following code snippet which is written to display all pharmacies along with its frontend. (4 marks)

```
userlist=findViewById(R.id.users_list);
```

```
listItem=new ArrayList<>();
private void viewData() {
    Cursor cursor= db.viewData();
    if(cursor.getCount()==0){
        Toast.makeText( context: AddNewPharmacy.this, text: "No Data Found",Toast.LENGTH_LONG).show();
    }
    else{
        while (cursor.moveToNext()){
            listItem./* Question 02 d) -- A */
        }
        adapter=new ArrayAdapter<>( context: this, android.R.layout.simple_list_item_1,listItem);

        /* Question 02 d) -- B */
    }
}
```

- i. A - insert(cursor.getString(1)); B - userlist.setAdapter(adapter);
- ii. A - add(cursor.getString(1)); B - userlist.setAdapter(adapter);
- iii. A - add(cursor.getString(i)); B - userlist.setAdapter(adapter);
- iv. A - add(cursor.getString(1)); B - userlist.addToAdapter(adapter);
- v. A - insert(cursor.getString(1)); B - userlist.addToAdapter(Adapter);

- e) The newly added pharmacy name should be inserted to database when click on the add button. Underline the correct code snippet with the space named as A to complete the following button click event. Note that insertData() function is written in the server end with relevant SQLite code as given below.

(3 marks)

```
public boolean insertData(String name){
    SQLiteDatabase db=this.getWritableDatabase();
    ContentValues contentValues=new ContentValues();
    contentValues.put(NAME,name);
    long result=db.insert(DB_TABLE, nullColumnHack: null,contentValues);
    return result!=-1;
}
```

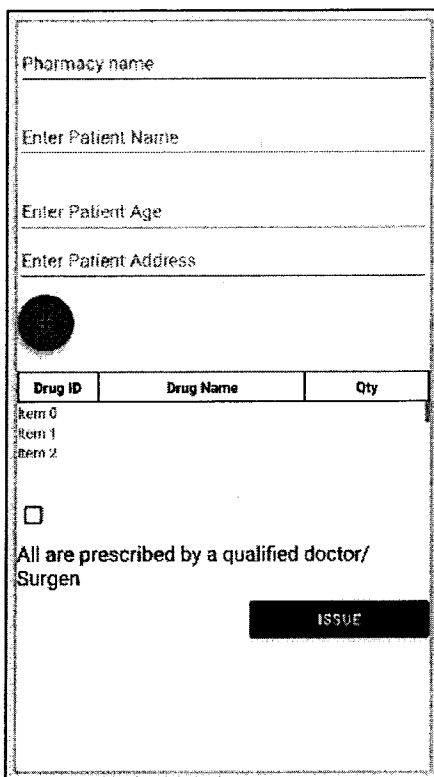
```
add_data.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View view) {
        String name=add_name.getText().toString();
        if(!name.equals("") && db./* Question 02 e) A */ ){
            Toast.makeText( context AddNewPharmacy.this, text "Data Added",Toast.LENGTH_LONG).show();
            add_name.setText(null);
            listItem.clear();
            viewData();
        }
        else{
            Toast.makeText( context AddNewPharmacy.this, text "No Data Added",Toast.LENGTH_LONG).show();
        }
    }
});
```

- i. insertData(view.name)
- ii. insertData(String name)
- iii. insertData(name)
- iv. insertData(i)
- v. insertData(add_name)

Note: When the user selects a pharmacy from the list, he/she will redirect to the PurchaseDrugsActivity.

Question 3 – PurchaseDrugsActivity**(30 marks)**

Patients can purchase drugs from the selected pharmacy. The following layout A is designed to order the required drugs with patient details. At each time when the user wants to add a new drug item, he/she must click on the + icon and then he / she will redirect to the layout B (AddDrugs.java) to enter the drug name with the quantity. When that drug is added there, the drugs table appear on layout A will be updated with the newly added drug details.




Pharmacy name

Enter Patient Name

Enter Patient Age

Enter Patient Address



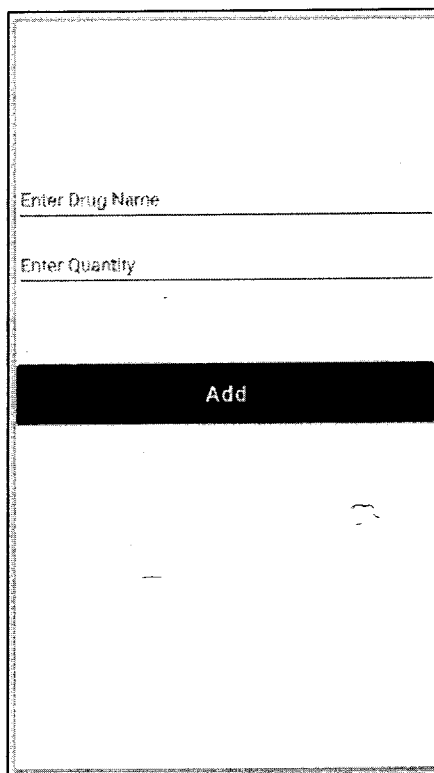
Drug ID	Drug Name	Qty
Item 0		
Item 1		
Item 2		

☐

All are prescribed by a qualified doctor/
Surgen

ISSUE

Layout A



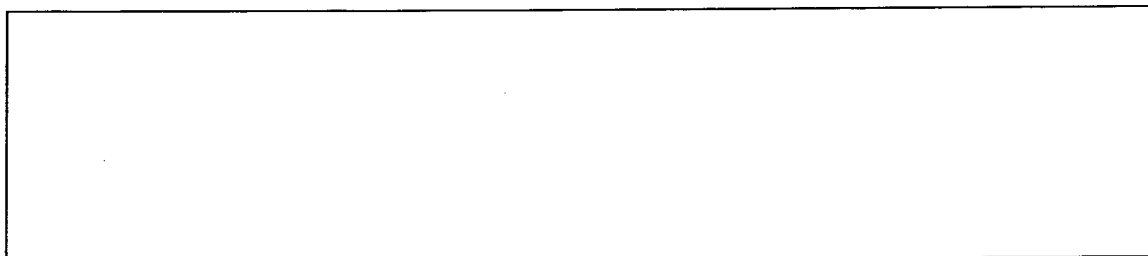
Enter Drug Name

Enter Quantity

Add

Layout B

- a) Pharmacy Name text field is filled by default with the selected pharmacy name when the user opens layout A. So that it is not allowed to be edited by the users.
- Write the java code to dynamically restrict that text field not to editable by users. Note: You can create additional variables/ objects by your own whenever necessary. (4 marks)



- ii. Write the java code to receive the pharmacy name coming as an extra message when starting layout A. (4 marks)

Note: You can suggest any tag value and use any variables whenever necessary.

- iii. Write the java code to dynamically set the above received pharmacy name at the top of the layout A as shown in the above picture. (3 marks)

- iv. What is the UI Element that you should use if you want to automatically set the patient's location instead of patient address in Layout A in Question 3? (2 marks)

- b) i. The checkbox should be disabled and not checked if at least one drug detail is not there on the table. Write the java code statement to make the checkbox disabled and not checked before the table is filled with records. (Only the code belongs to the checkbox would be enough) (4 marks)

Note: You can define your own objects and variable names when necessary.

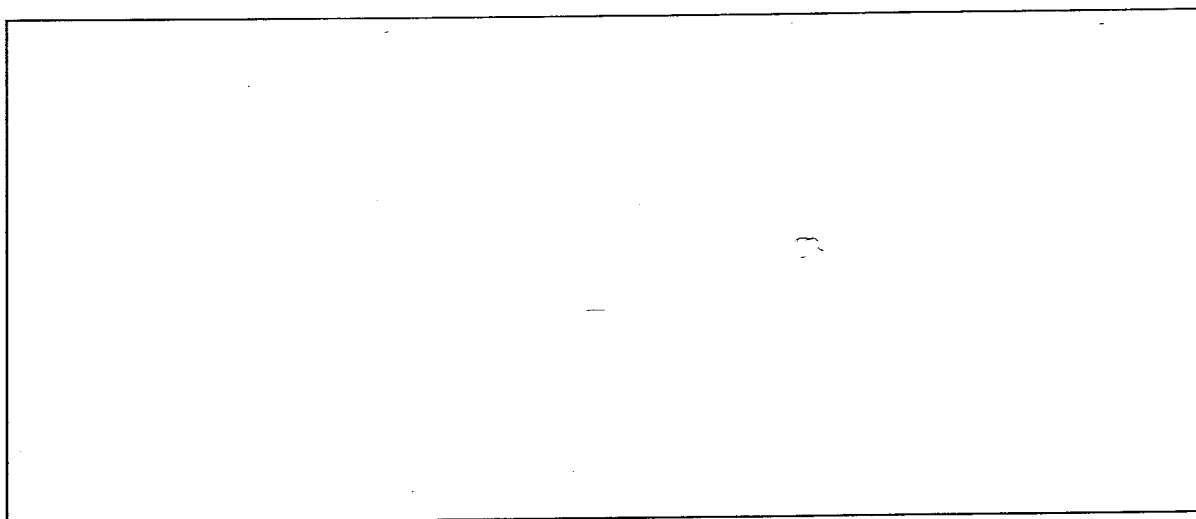
- ii. The Issue button appears in Grey color until the user checks the statement, "All are prescribed by a qualified doctor/surgeon". When the user tick on the checkbox, the Issue button should be changed its color into Blue (color code = Color.BLUE). Write the java code snippet to implement this scenario. (5 marks)

Note: You can define your own objects and variable names when necessary.

iii. Assume that the Issue button does not appear to the user until the checkbox is checked. Select the correct code snippet to make the button visible to the user. (Note that UI element ID is btn and Button object created is btnIssue) (3 marks)

- I. `btn.setVisibility(View.Visible)`
- II. `btnIssue.setVisibility(View.Visible)`
- III. `btnIssue.setVisibility(View.Enable = true)`
- IV. `btn.setVisibility(View.Enable = true)`
- V. `btnIssue.setVisibility(View.Enable = 1)`

c) When the user adds a new drug and required quantity from layout B (AddDrugs.java) and clicks on Add button, the inserted values should be first sent to the server end and update the drugs inventory. `addNewDrug()` function is written in server end (`dbHelper.java` class) to accept these input values. Write the java code to retrieve the user inputs from the layout and send them to server end. (5 marks)
Note: You can define your own objects and variable names when necessary.



Question 4 – PaymentsActivity**(30 marks)**

- a) Assume that the purchased drugs along with the quantity will be saved in the database with price for each item in Purchase table. Write the java code to retrieve the content added at the moment **from the database and display them** as a table as displayed on the picture given below with the total. Explain in your words when necessary. (12 marks)

Paracetamol	100.00
Vitamin C	50.00
Amoxilin	435.00

Total	585.00
-------	--------

Select Payment Method

☐ Visa/master

☐ Cash on Delivery

PAY NOW

Amount to be paid

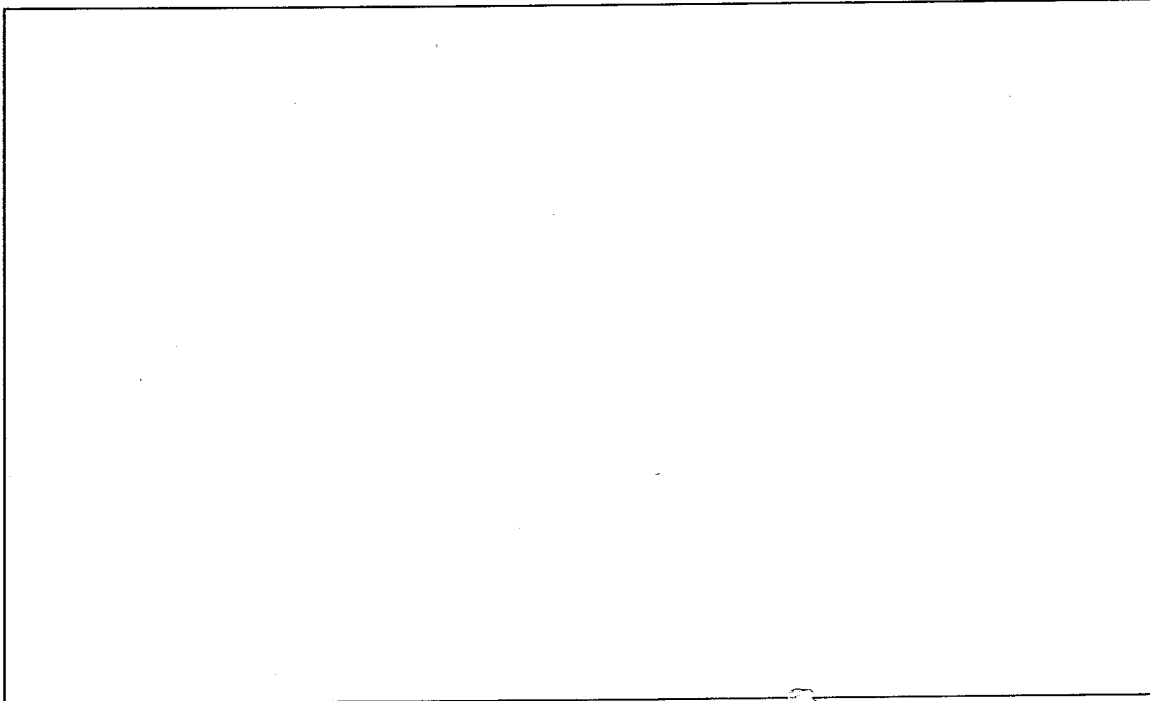
// Server end

// Frontend

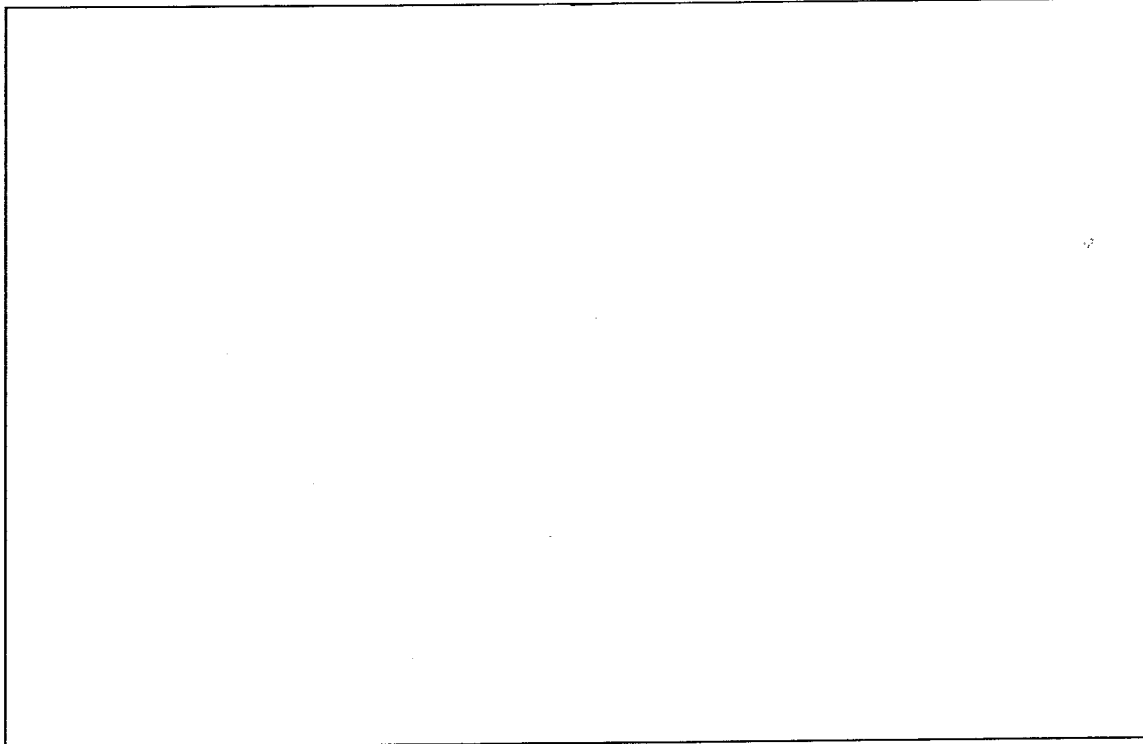
b) Users are given two options to be paid the amount either by a card payment or as Cash on Delivery payment. If the user selects Card payment option, he/she will be given an 5% offer.

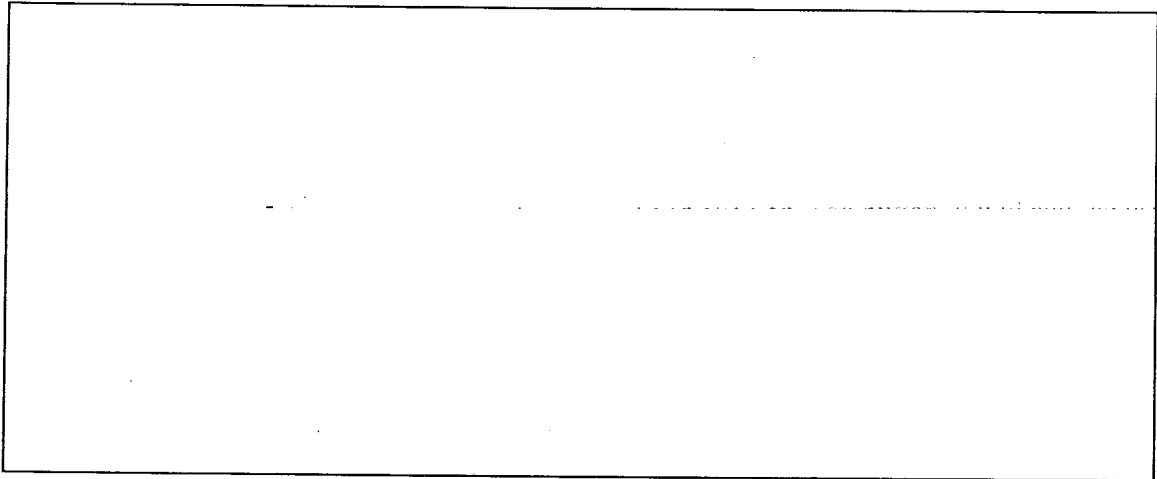
Write the java code to calculate the discounted total according to the selected card type and display the final amount to be paid on the text field and make its font color as Red. (color code = Color.RED) (8 marks)

- c) Briefly explain what have already applied or/and how you can apply your knowledge on Mobile UI design principles to this layout with examples to improve the user experience. (5 marks)



- d) Write 3 functional test cases and 2 unit test cases to regarding this payment layout. (5 marks)





e) Briefly explain the usage of following UI elements.

(1*5=5 marks)

i. RadioGroup –

ii. E-mail –

iii. Multiline Text –

iv. Card View –

v. SearchView –

End of the Question Paper