FINAL

(SESSION FEBRUARY 2024)

Programming for Mobile Devices
CCS21503

LECTURER :

FEBRUARY 2024 **TIME : 3 HOURS**

Instructions :

1. Candidates must read all questions carefully.
2. The examination script consists of the followings:

Types of Questions	Instruction	Duration
ESSAY (Option)	Answer **4** out of 6 questions.	3 Hours

(ESSAY Option)

(100 Marks)

Duration : 3 Hours

INSTRUCTION

INSTRUCTION

This part consists of SIX (6) questions. Answer **FOUR (4)** questions only in the answer booklet provided.

(Question 1)

Java 2, launched in 1998, represented a pivotal milestone in Java's development, introducing three distinct editions tailored to various development requirements. These editions, namely J2SE (Java 2 Standard Edition), J2EE (Java 2 Enterprise Edition), and J2ME (Java 2 Micro Edition), formed the basis for Java's broad applicability across different computing environments, including its role in shaping the Android operating system.

(a) Discuss the key features and functionalities of J2SE, emphasizing its role in providing a foundational platform for general-purpose Java applications.

(5 marks)

(b) Provide a concise overview of J2EE, outlining its significance in the development of enterprise-level Java applications. Highlight the key components and services offered by J2EE, such as servlets, Java Server Pages (JSP), Enterprise JavaBeans (EJB), and transaction management.

(5 marks)

(c) Describe the core characteristics of J2ME and its role in the realm of mobile and embedded systems.

(5 marks)

(d) Provide and explain any **FIVE (5)** significances of having an emulator in the Android environment.

(10 marks)

25 marks

(Question 2)

Based on the **Figure 1** below, answer the following questions:

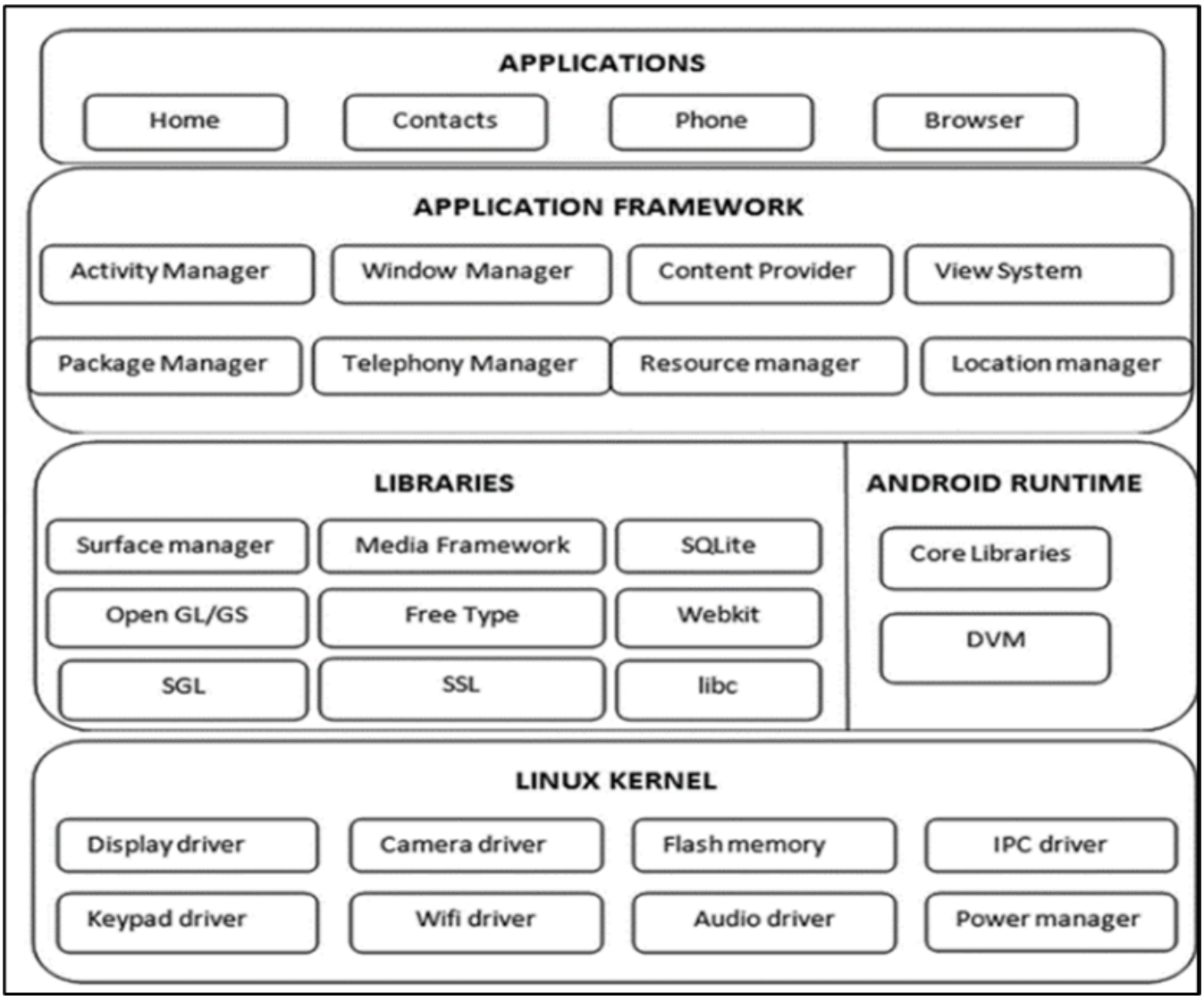

Figure 1

(a) Explain the **FIVE (5)** fundamental components and architecture of the Android operating system.

(10 marks)

(b) Explain the **THREE (3)** key elements that contribute to the seamless functioning of Android on mobile devices.

(6 marks)

(c) Elaborate on how the Android system architecture supports essential features such as multitasking, security, and resource management.

(9 marks)

25 marks

(Question 3)

Upon the launch of Android 13 in August 2022, Google announced an approximate user base of 3.6 billion active users globally. As per Statista's report from 2023, the Google Play Store, serving as Android's official digital marketplace, commands a significant 71.47% share of the global mobile operating systems market. In competition with Android, iOS stands as another prominent operating system. Since its inception in June 2007, iOS has progressively increased its market share to reach 27.6%. This heightened competition and the substantial user bases of both platforms prompt developers to prioritize the development of applications compatible with both iOS and Android.

(a) Based on the information above, discuss the market share trends potential effects on mobile application development on both Android and iOS platforms.

(10 marks)

(b) Explain the implications for developers aiming to create cross-platform applications.

(10 marks)

(c) Provide any **TWO (2)** significant factors driving developers' interest in creating applications compatible with both platforms.

(5 marks)

25 marks

(Question 4)

Figure 2 illustrates the graphical user interface (GUI) of an Android application, displaying various components such as buttons, text fields, and labels. You are required to complete the code provided with bold comments in **Figure 3**. Implement the necessary logic and functionality in the provided code to ensure that the GUI behaves as intended. This may include event handling, data validation, and interaction with external resources to provide a seamless user experience.

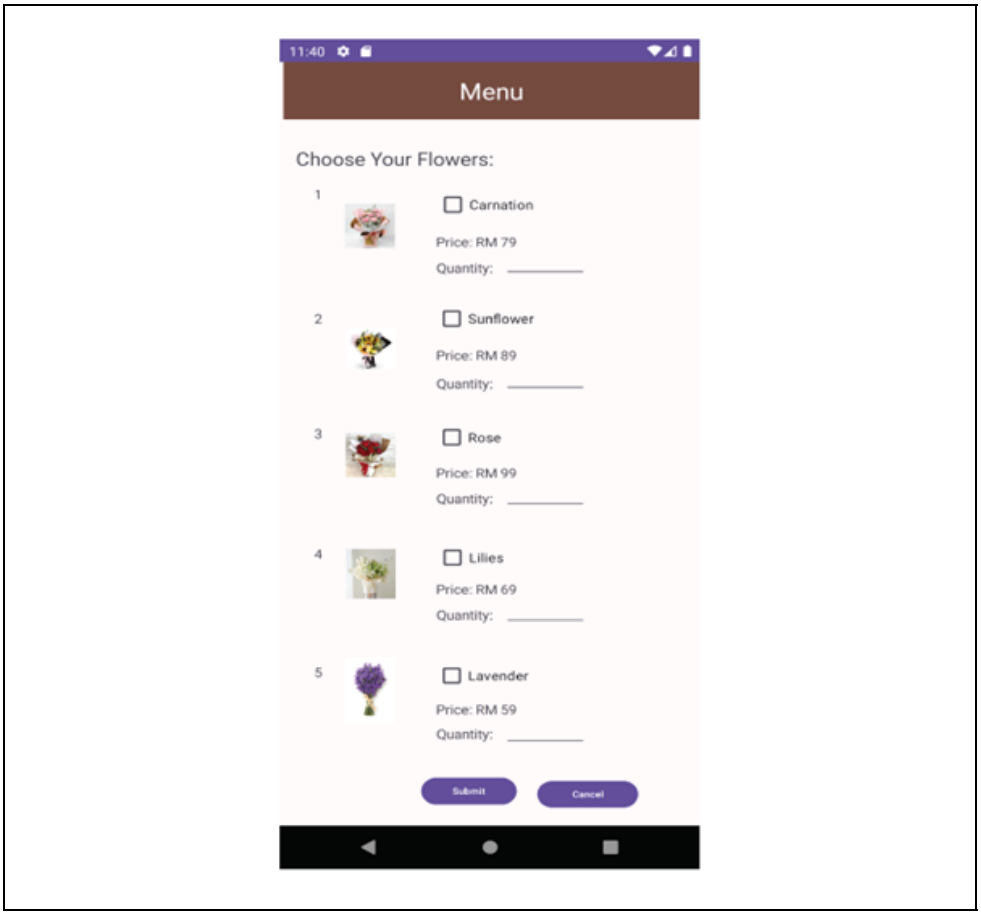

Figure 2

```
:
:
public class Activity3 extends AppCompatActivity {
 CheckBox carnation, sunflower, rose, lilies,lavender;
 EditText
quantity1,quantity2,quantity3,quantity4,quantity5;
@Override
protected void onCreate(Bundle savedInstanceState) {
 super.onCreate(savedInstanceState);
 setContentView(R.layout.activity_3);
 carnation= findViewById(R.id.checkBoxcarnation);
 sunflower= findViewById(R.id.checkBoxsunflower);
 rose= findViewById(R.id.checkBoxrose);
```

```
 lilies= findViewById(R.id.checkBoxlilies);
 lavender= findViewById(R.id.checkBoxlavender);
 quantity1 = findViewById(R.id.q1);
 quantity2 = findViewById(R.id.q2);
 quantity3 = findViewById(R.id.q3);
 quantity4 = findViewById(R.id.q4);
 quantity5 = findViewById(R.id.q5);
//create a submit button and submit all details and
move //to the next page
 …….
 button.setOnClickListener(new OnClickListener() {
 @Override
 public void onClick(View v) {
 StringBuilder cost= new StringBuilder();
 int amount =0;
 cost.append("\nYour Order Details\n");
//If menu1 is chosen, retrieve information on the
name, //price, and quantity for the total page
if (carnation.isChecked())
{
…….
}
//If menu2 is chosen, retrieve information on the
name, //price, and quantity for the total page
if(sunflower.isChecked())
{
…….
}
//If menu3 is chosen, retrieve information on the
name, //price, and quantity for the total page
if(rose.isChecked())
{
…….
}
//If menu4 is chosen, retrieve information on the
name, //price, and quantity for the total page
if(lilies.isChecked())
{
…….
```

```
}
//If menu5 is chosen, retrieve information on the
name, //price, and quantity for the total page
if(lavender.isChecked())
{
…….
}
//calculate and display overall total amount
cost.append("\n\nTotal Payment: RM " ).append(amount);
cost.append("\nThank you!");
String r=cost.toString();
Intent i=new Intent(Activity3.this, Activity4.class);
i.putExtra( "Cost",r);
startActivity(i);
Toast.makeText(getApplicationContext(),"Total Amount
= "+amount+"/-",Toast.LENGTH_LONG).show();
            }
});
Button cancel= findViewById(R.id.cancel1);
cancel.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
//For the cancel button that clears all the text input
  …….

 if (carnation.isChecked()) {
  …….
 }
 if (sunflower.isChecked()) {
  …….
 }
 if (rose.isChecked()) {
  ……. }
 if (lilies.isChecked()) {
   ……. }
 if (lavender.isChecked()) {
   …….
 }
```

```
});}}
```

Figure 3

25 marks

(Question 5)

The surging demand for mobile gadgets, the expanding realm of mobile apps, and the intensifying competition for wireless networks collectively position application development as a field with immense potential. The reliance on mobile application development in the wireless communication system has grown significantly, accompanied by a corresponding increase in encountered challenges. Thorough planning and execution of a well-defined mobile application development process can lead to successful outcomes. Nevertheless, developers continue to grapple with numerous challenges, particularly those related to both hardware and software aspects.

Discuss in detail any **FIVE (5)** challenges faced in mobile application development and propose best practices to overcome these challenges.

25 marks

(Question 6)

You have been hired as a UX/UI designer for a popular fitness app called FitLife. FitLife aims to help users achieve their fitness goals by providing personalized workout plans, nutrition tracking, and progress monitoring features. As part of your role, you are tasked to visually redesigning the user interface of the FitLife app to improve user engagement and retention.

Using sketches, illustrate your proposed design focusing on the following key areas and include the creation of these **FIVE (5)** user interfaces:

(a) User Onboarding Experience

Enhance the onboarding process to guide new users through setting up their fitness goals, preferences, and initial assessments in a seamless and intuitive manner. Provide clear instructions and interactive elements to keep users engaged from the outset.

(b) Workout Plan Customization

Improve the interface for creating and customizing workout plans to make it more intuitive and user-friendly. Allow users to easily adjust workout intensity, duration, and exercises based on their preferences and fitness levels. Incorporate visual cues and progress trackers to motivate users and track their achievements.

(c) Nutrition Tracking and Meal Planning

Streamline the nutrition tracking and meal planning features to help users maintain a balanced diet and meet their nutritional goals. Introduce intuitive interfaces for logging food intake, tracking calorie consumption, and accessing nutritional information. Provide personalized meal recommendations and recipe suggestions based on users' dietary preferences and fitness objectives.

(d) Progress Monitoring and Feedback

Revamp the progress monitoring tools to provide users with insightful feedback on their fitness journey. Implement interactive dashboards and visualizations to showcase users' progress over time, including changes in weight, body measurements, and fitness milestones. Incorporate motivational messages, achievement badges, and social sharing features to celebrate users' successes and encourage community engagement.

(e) Accessibility and Inclusivity

Ensure that the redesigned interface is accessible to users of all abilities and inclusive of diverse demographics. Incorporate features such as customizable font sizes, colour contrast adjustments, and voice-guided navigation to accommodate users with visual or motor impairments. Conduct usability testing with a diverse group of users to gather feedback and iterate on the design for optimal inclusivity.

25 marks

END OF QUESTION