B. C.A. (Semester - 5)

CS5002: Fundamentals of Mobile Application Development
Practical Workbook
SET: B

Course Credit: 04   **Total Hours:** 04

Course Objective: To build knowledge of mobile technologies and its environment to design, develop and deploy applications for mobile devices using design elements, data management, system services, and media APIs.

Course Outcomes:

CO1: Describe mobile technologies, its versions, mobile application development architecture and environment.

CO2: Describe the mobile application development life cycle and way of communication between application components.

CO3: Design and develop mobile applications user interface using designing elements.

CO4: Analyze and use appropriate data storage options such as Shared Preferences, Internal, External and Database to manage data into mobile applications.

CO5: Creating and implement the background services and user alerts for improving the performance of the mobile application.

CO6: Integrate multimedia into mobile applications using media API.

Programme Outcomes:

PO1: Ability to understand the concepts of key areas in computer science.

PO2: Ability to design and develop system, component or process as well as test and maintain it so as to provide promising solutions to industry and society.

PO3: Effective communication and presentation skill.

PO4: Ability to understand professional and ethical responsibility.

PO5: Recognition of the need for life-long learning.

Unit No.	Practical No.	Total Hours	Course Outcomes	Program Outcomes
1	1, 2	07	CO1	PO2, PO3,PO5
2	3, 4	12	CO1,CO2	PO2, PO3,PO5
3	5, 6	07	CO1,CO2,CO3	PO2, PO3,PO5
4	7, 8, 9	13	CO1,CO2,CO3,CO4	PO2, PO3,PO5
5	10, 11	09	CO1,CO2,CO3,CO4,CO5,CO6	PO2, PO3,PO5
6				PO2, PO3,PO5
Total	**11**	**48**		

Laboratory Instruction:

- Students will not be permitted to attend the laboratory unless they bring the practical journal.
- Students should obtain the signature of the allocated lab teacher in the journal after completing each experiment.
- The nature of submission is handwritten for all the problem definitions.
- Students may show exercise output on his/her device.
- Prerequisite for Journal Certification: Students must show one integrated mobile application that covers each exercise.
- A students must have the following computing environment in the laboratory and/or on his/her laptop.
    - Android Studio 3.0 or above.

Develop a mobile application according to the given requirements.

Name of an Application: MyMedicalShop

Application User: Medical Shop Owner

Purpose: MyMedicalShop is an application designed to help you manage and track your daily medicine sales and streamline your daily cash transactions.
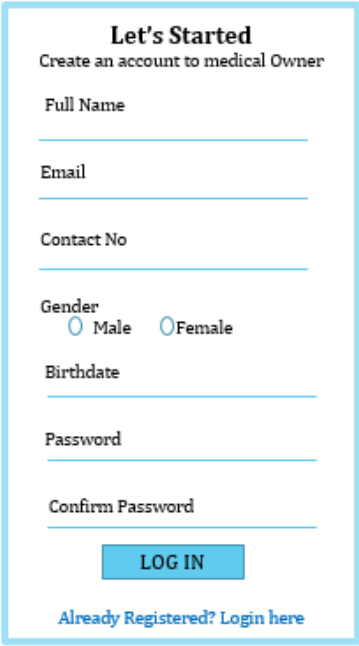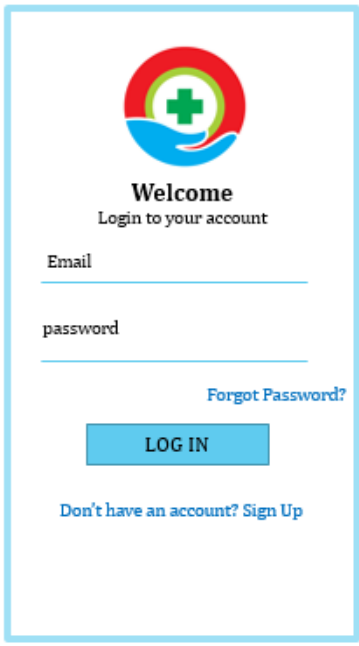
Definition: This application enables a medical store owner to efficiently manage daily operations. A medical store owner must register in the application to access its functionalities. MyMedicalStore application tracks inventory details, customer orders, and more. The application generates various reports based on daily transactions and monthly summaries. Additionally, it offers reminder and alert features for both customers and the store owner.

The application provides the following functionalities to the Owner:

- Owner can register and log in to the system.
- Owner can manage his/her profile.
- Add/View medicine details.
- View monthly reports.
- Daily Reminder.
- Owner can customize the application's settings.

Practical No. 1	Enrolment No._____

Practical Problem	A. Download at least one published application from each category given below from the Google Play Store and prepare comparative study table for your studied application and compare them based on given parameters.
	
	Categories:
	
	    • Education
	    • Sports
	    • Food and Drink
	    • Auto and Vehicles
	
	Sample Format for Comparative study table:
	
	table below
	
	B. Write a sequence of steps to prepare the configuration file with the following requirements :
	    ○ Application Name: MyMedicalShop
	    ○ Application Version Code: 1.0
	    ○ Application Version Name:1.0.0
	    ○ Set minimum SDK version: 18
	    ○ Set appropriate application launcher icon.
	
	C. Write a sequence of steps to create a Virtual Device and test your application on version 32.

Parameter	Application Name- Education Domain	Application Name- Entertainment Domain	Application Name- Tools & Utilities
Introduction			
Scope			
Functionalities			
User Interface			
Navigation			
Customer Satisfaction(Rating available on Play Store)			
Your Rating out of 5			
Justification for Your Rating			

Objective(s)	Student shall be able to understand requirements and features of mobile apps of different categories.
Pre-requisite	Installed Android Apps
Duration for completion	3 hours
	Nature of submission : Handwritten solution
Solution must	Comparison study table with appropriate detail description

contain	

<table>
<tr><td colspan="3" align="center">Assessment</td></tr>
<tr><td align="center">Evaluation Criteria</td><td align="center">Marks</td><td align="center">Secured by Student</td></tr>
<tr><td align="right">System Understanding</td><td align="center">4</td><td></td></tr>
<tr><td align="right">Application Requirements and Designing Analysis</td><td align="center">4</td><td></td></tr>
<tr><td align="center">Document Format: Report Structure, Sentence Formation, Fonts and Styles, Word choice and Grammar</td><td align="center">4</td><td></td></tr>
<tr><td align="right">Technical Viva</td><td align="center">3</td><td></td></tr>
<tr><td align="right">Teacher's Signature & Date</td><td></td><td></td></tr>
</table>

Practical No. 2	Enrolment No._____
Practical Problem	Develop the designated screens for the **"MyMedicalShop"** Application. Implement a registration facility for the medical shop owner to get the services provided by application. When the medical shop owner clicks on the "Sign Up" button, the user should be redirected on the Signup screen. The user needs to fill the details in the form asked for the registration process. The registration process requires some mandatory details, which are: Full Name, Email Address, Contact Number, Gender, Birthdate, Password and Confirm Password. Create a date-picker dialogue box to choose the birthdate. Add the different validations to the "Full name, Email, contact number and password" fields rather than using the required field validation. When the clicks on the "Sign In" button, provide a login screen to the medical shop owner which asks for the login credentials. Medical shop owner can login through their registered email address and password. To authenticate the medical shop owner, static data can be used. If the he/she makes three unsuccessful login attempts, then warn the medical shop owner that he/she had exceed the maximum limit for login attempts. Also, validate the contact number and password fields. *Figure 1 Welcome Activity* *Figure 2 Sign-Up Activity* *Figure 3 Sign-In Activity*
Objective(s)	To understand single screen and multi-screen application designing and development.
Pre-requisite	Basic Core components of mobile application, Activity and Intent
Duration for completion	4 hours	**Nature of submission :** Handwritten solution
Solution must contain	Login and Register screen source code, Manifest file code, XML design code of both screen and Output of Screen.

References for solving the problem	Wei-Meng Lee, Beginning Android 4 Application Development, Wiley India Pvt Ltd. Page No: 29-32
Sample testing data and Outcome	Login and Registration Activity validations to be tested based on the nature of the fields:

Assessment			
Evaluation Criteria	**Marks**	**Secured by Student**	
UI Design	5		
Usage of appropriate validations	4		
Logic for maximum authentication attempts	3		
Technical Viva	3		
Teacher's Signature & Date			

Practical No. 3	Enrolment No._____
Practical Problem	Consider practical- 2 and perform the following functionalities: A. After successful registration, redirect an owner to the "Sign-In" screen where owner can view the Email Address and Password fields which are auto-filled with the values provided while registration. B. After successful Login, redirect an owner to the home screen of an application. Follow and implement at least five designing principles on the home screen of application. The home screen provides the several options like: Add Medicine Details, Add Customer Details, Sells, Reports, About Us. Whenever user clicks on the particular option from home screen, navigate the user to the appropriate screen. C. When the owner chooses the Account option from the home screen, the owner must be able to view the entered details during Sign-Up process.
Objective(s)	• To understand mobile application design principles and design user interface for mobile application and also prove observation and analysis skills. • To connect different screens of a mobile application.
Pre-requisite	Usage of resources, layouts and intents.
Duration for completion	4 hours	**Nature of submission :** Handwritten solution
Solution must contain	Updated code of Sign In, Profile Activity and Homescreen layout code and output of Screen with remarks of applied design principles
References for solving the problem	Wei-Meng Lee, Beginning Android 4 Application Development, Wiley India Pvt Ltd.
Sample testing data and Outcome	NA

	Assessment		
	Evaluation Criteria	**Marks**	**Secured by Student**
	Auto filled Data	4	
	Navigation of activity	3	
	Apply Designing Principles	3	
	Timeliness	2	
	Technical Viva	3	
	Teacher's Signature & Date		

Practical No. 4	Enrolment No._____

Practical Problem	Consider practical- 3 and perform the following functionalities:
	
	A. When the owner clicks on Add Medicine Details option, provide a screen to the user to add medicine. To do so, owner need to fill the following details:
	
	    • Medicine Name
	    • Medicine Category
	    • Manufacture Date
	    • Expire Date
	    • Amount
	
	Categories for Medicine are: Analgesics, Antibiotics, Antivirals, Antidiabetics, Gastrointestinal agents.
	
	B. When the owner clicks on Add Customer Details option, provide a screen to the owner to add the details. To do so, users need to fill the following details:
	
	    • Name
	    • Contact No
	    • Medicine Name
	    • Quantity
	    • Price
	    • Total amount
	
	C. Provide a screen to the owner to view the "Sells". Sells are the records of medicine purchase by the customer which is added by the owner

Objective(s)	Student shall be able to implement the accessibility of inbuilt application and understand reflection of different layouts in mobile UI.
Pre-requisite	Basic core components of mobile application, Layout, Screen Elements and Application resources
Duration for completion	4 hours **Nature of submission :** Handwritten solution
Solution must contain	• Layout file for Add Medicine Details, Add Customer Details, and Sells. • Screenshots of output
References for solving the problem	Wei-Meng Lee, Beginning Android 4 Application Development, Wiley India Pvt Ltd.
Sample testing data and Outcome	NA

Assessment			
Evaluation Criteria	**Marks**	**Secured by Student**	
Usage of Explicit Intent	3		
Add Medicine or Customer	3		
View Sells	3		
Usage of Proper Controls & Validations	3		
Technical Viva	3		
Teacher's Signature & Date			