**Mobile Application development**

**UNIT – 1:**

**J2ME Overview:** Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Device, **Small Computing Technology**: Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants

**Short Answer Questions:**

1. how does J2ME differ from other editions of Java, such as J2SE and J2EE.
2. Discuss the advantages and challenges of developing applications using J2ME for wireless applications.
3. List the challenges facing by mobile small computing Industry?
4. Describe the limitations of J2ME.
5. List J2ME Profiles.
6. Describe the purpose of carrier signal in Radio Transmission?
7. List some Personal Digital Assistants.

**Long Answer Questions:**

1. Explain the role of the Connected Limited Devices Configuration (CLDC) and the Mobile Information Device profile (MIDP) in J2ME application development.
2. Describe the functionalities and applications of personal digital assistants (PDAs) in the context of J2ME development.
3. Discuss about multi-tier web services and write the role of J2ME in multi-tier web service.
4. Describe the Radio data networks in detail.
5. Describe the importance of messaging services in J2ME applications, including SMS, MMS and push notifications.
6. Describe the functionalities and applications of personal digital assistants (PDAs) in the context of J2ME development
7. Explain the principles of wireless technology, including different types of wireless networks and their applications in small computing devices.
8. Discuss the different profiles and configurations available in J2ME and their respective use cases.
9. Analyze the impact of J2ME on the mobile and embedded systems industry, citing examples of successful applications developed using this platform.

**UNIT – II**

**J2ME Architecture and Development Environment:** J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit

J2ME Best Practices and Patterns: The Reality of Working in a J2ME World, Best Practices

**Short answer Questions**

1. Define connected limited devices configuration (CLDC) layer in J2ME framework
2. Lis the software layers comprise the J2ME architecture.
3. Analyze the minimum display of pixels requires handling bitmapped graphics in small computing devices
4. Is data can be shared between MIDlets that are not from the same MIDlets suite?
5. Define Java Archive (JAR) file and Java Application Descriptor (JAD) file
6. Write the basic MIDlet shell?
7. Describe the best practices are proven design and programming techniques used to build J2ME system.

**Long answer Questions:**

1. Provide an In-depth overview of the architecture of J2ME, including its layers, components, and runtime environment.
2. Explain how J2ME accommodates the constraints of small computing devices while providing a robust environment for application development.
3. Discuss the key requirements and constraints of small computing devices that influence the design and development of J2ME applications.
4. Explain how the J2ME runtime environment manages memory, handles exceptions and executes bytecode in resource-constrained environment.
5. Explain the concept of MIDlets in J2Me and their role as application components for mobile and embedded devices.
6. What is MIDlet Suite and explain the life cycle of MIDlet in detail
7. Development MIDlet application to create and manipulate an instance of String Item object.
8. Explain how developers use J2ME SDKs to create, test, debug and deploy applications for small computing devices.
9. **Write J2ME application for creating a "Hello World" application using J2ME, including setting up the development environment, writing the code, and deploying the application to a target device.**
10. Explain the concept of MIDlet suite and how it allows multiple MIDlets to be bundled and deployed as single application package.
11. Discuss the unique challenges and constraints faced by developers when working in the J2ME ecosystem, including device fragmentation, limited resources, and varying platform capabilities.
12. Provide examples of design patterns, coding techniques, and optimization strategies that can improve the quality and maintainability of J2ME codebases.

**UNIT – III**

**Commands, Items, and Event Processing:** J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling

High-Level Display: Screens: Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class

Low-Level Display: Canvas: The Canvas, User Interactions, Graphics, Clipping Regions, Animation

**Short answer questions**

1. Define Exception.
2. Define Event processing.
3. List out small computing devices.
4. Define J2me patterns
5. List out user interfaces for a J2ME application.
6. Explain about Display class with example
7. Explain in detail the Command class.
8. List the methods needed to manage Item class
9. List the methods define by the Item State Listener interface.
10. Write about Ticker class
11. Define animation.
12. Write the syntax of Textbox Class

**Long answer questions**

1. Explain Item class in detail with an example application
2. Develop J2ME application to draw an arc and print on Canvas
3. Discuss the methods provided by the Graphics Class for defining and manipulating clipping regions.
4. Describe the Graphics class and its role in drawing shapes. Explain with simple J2ME application
5. Develop a MIDlet application which creates the following kind of menu
6. Cut
7. Copy
8. Paste
9. Delete
10. Select all
11. Unselect all
12. Develop a MIDlet application for implementing event handling
13. Develop a MIDlet application for Implementing Input checking program
14. Write a J2ME program to crating & manipulating an instance of Date Field Object
15. Create an MIDP application which examine phone number, which a user has entered is in the given format

* Area code should be one of the following 040,041,050,0400,044
* There should 6 to 8 numbers in telephone number

1. Develop a J2ME application to Creating and Manipulating an instance of Guage Class.
2. Develop a MIDlet application to select list item
3. Write a MIDP application to create calculator to perform operation like add, substract, multiply and divide using List.

**UNIT- IV:**

**Record Management System:** Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener

JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions.

JDBC and Embedded SQL: Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Subqueries, VIEWs

**Short answer Questions:**

1. Explain record storage
2. Explain how to read and write records in RMS with an example
3. Cerate an MIDP application to perform searching records
4. Explain the record enumeration
5. Explain in brief about the record listener interface
6. What are the types of JDBC drivers?
7. Explain about database connection in JDBC
8. Explain the ResultSet class
9. Write the differences between Callable statement and Prepared Statements
10. Write short notes on views
11. Explain briefly about
12. Savepoint
13. Batch statement
14. Auto generated keys

**Long answer questions:**

1. Create a MIDP application, where the user can enter player name and points. The program saves the information to the record using RMS (Record Management System) at MIDP device.

Program should also print out the top 10 players list to the end user. You can use this class in your game if you made own class for saving and reading record sets.

1. Explain in detail about the RMS
2. How will you access the required data from the record store? Explain with example J2ME application.
3. Explain the process of sorting the records of record store.
4. How the data is stored in the mobile explain with suitable example
5. Explain the process of connecting the database in detail
6. Discuss the different statement objects in detail
7. Explain the various JDBC Drivers in detail.
8. Explain the tables in terms creating, inserting and retrieving data
9. Explain the DML command of table
10. What are the various types of joins on table? Explain each with suitable example.
11. Explain the use of group by and ordering of data of tables.

**UNIT – V:**

**Generic Connection Framework:** The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process

**Short answers questions**

1. Briefly explain communication management using HTTP commands
2. Write short notes on session management
3. Explain the process how to create an HTTP connection
4. Write the syntax to create file protocol
5. List out different types of http response methods
6. List out different protocols to perform communication
7. Explain how to send data through HTTP protocol

**Long answer questions**

1. Develop a MIDlet application to implement web application – sports update
2. Describe the key features and characteristics of a generic connection framework.
3. Provide an overview of the HTTP protocol and its significance in web-based communication.
4. Discuss the various HTTP methods (GET, POST, PUT, DELETE) and their use cases in different scenarios.
5. Describe how HTTP commands are used for managing communication between clients and servers.
6. Discuss different approaches to session management in a generic connection framework.
7. Discuss the concept of transmitting data as a background process and its benefits in asynchronous communication scenarios.
8. Provide examples of real-world applications where background data transmission is essential for improving performance, responsiveness, and user experience.