Ref. No.: Ex/PG/DMC/T/114A/2024

M.Tech Distributed and Mobile Computing First Year First Semester
Programming Mobile Devices
Part: Full

Full Marks: 100

Answer **question no. 1** (mandatory) and any ***four*** from the rest. Make your answer brief and to-the-point. Use **illustrative diagrams** wherever it is necessary.

1.

a. What is ***abstraction***? Can ***abstraction*** have the **leaking property**? Justify your answer with suitable example.

b. Show the process of allocating a variable statically with suitable **programming code**. State the benefits of such allocation and how is it implemented in ***object-oriented*** setting.

c. **Energy management** is a common concern in a mobile device. Discuss different techniques to reduce **energy consumption**.

(2+5) + (3+4) + 6

2.

a. Name the **resource management approaches** that are used in **mobile platform**. Describe those approaches and explain which one among them is more suitable for **resource-constrained devices**.

b. Name the different **locations** inside **RAM**, where the **variables** can be stored during execution of a **program**. Show how a **data structure** can be allocated to such **memory locations** using suitable **programming code**.

(1+6+3) + (2+8)

3.

a. Show how the **layout** of a **data structure** can be optimized to reduce the **memory consumption**.

b. Explain how the following **design decisions** of **mobile java** can reduce the **memory consumption** of a program.

i. Avoid dependencies.
ii. Select the size when relevant and manage string usage.
iii. Manage class and object structure

8 + (3+5+4)

[Turn over

4.

a. Define the '**ghost references**' to an **object**? Show how it is created?

b. What is **application**? Which **architecture** is usually followed to design a **mobile application?** Describe that **architecture** and state its **advantages**.

(2+5) + (2+1+10)

5.

a. Describe the various **techniques** of **inter-thread communication**.

b. What is **faking concurrency?** State the **benefits** of using it.

c. What is **green thread**? How is it implemented? State the advantages of using it in **mobile platform**.

5 + (2+7) + (2+2+2)

6.

a. What is the ***dynamically-linked-library*** **(DLL)**? State the **challenges** of using **DLLs** in **mobile platform.** Define the **plugin** with a suitable example.

b. Compare between ***offset-based linking*** and ***signature-based linking***.

c. Discuss several **techniques** of **merging elements** used to reduce **memory consumption**.

(2+3+3) + 5 + 7

7.

a. What is **resource**? Describe the different **approaches** to **embedding resources** in the system? State the **merits** and **demerits** of these approaches.

b. What is **virtual machine**? Discuss how it can be used to host the **resources** of underlying **platform**.

(1+8+4) + (2+5)