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SL.NO:CAA 214044

# SRI SIVASUBRAMANIYA NADAR COLLEGE OF ENGINEERING

(An Autonomous Institution, Affiliated to Anna University, Chennai)
Rajiv Gandhi Salai (OMR), Kalavakkam – 603 110

## THEORY EXAMINATIONS

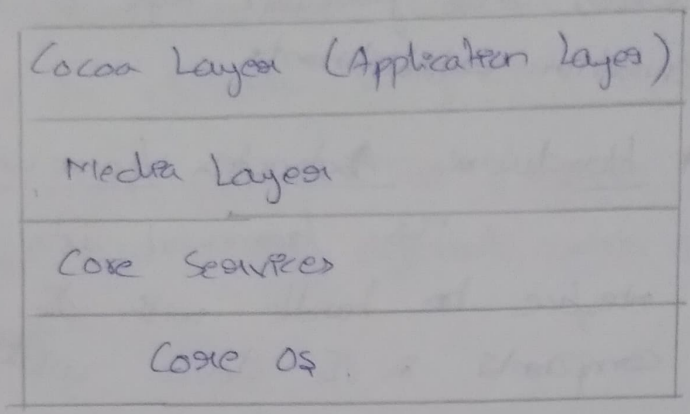
| | | | |
|---|---|---|---|
| Register Number | 205001085 | | |
| Name of the Student | Sabarivasan. V | | |
| Degree and Branch | BE CSE | Semester | VII |
| Subject Code and Name | UCS1702 - Mobile Computing | | |
| Assessment Test No. | III | Date | 6/11/2023 |

| Details of Marks Obtained | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Part A | | Part B | | | | Part C | | | |
| Question No. | Marks | Question No. | (a) Marks | (b) Marks | Total Marks | Question No. | (a) Marks | (b) Marks | Total Marks |
| 1 | 1 | 7 | | | 6 | 10 | | | 9 |
| 2 | 0 | | | | | | | | |
| 3 | 1 | 8 | | | 6 | 11 | | | |
| 4 | 1 | | | | | 12 | | | 9 |
| 5 | 1 | 9 | | | 2 | 13 | | | |
| 6 | 1 | | | | | | | | |
| Total (A) | 5 | Total (B) | | | 14 | Total (C) | | | 18 |
| Grand Total (A+B+C) | | | | 37/50 | Marks (in words) | | | | |
| Signature of Faculty | | | | | | | | | |

PART_C

(12)

## Layers of iOS architecture




(i) **Core OS**

⇒ This is the innermost layer in an iOS architecture.

⇒ This is being assisted with core level services for this architecture.

⇒ There are different frameworks involved in this Core OS. They are,

* **Security framework**: This framework helps in enhancing the security features and authentication and encryption.

* External Device framework

When connected to other interface or devices, this framework helps to maintain connection establishment.

* Hardware Abstraction framework

This framework acts as an interface to handle with the hardware components in the device with the core OS.

(ii) Core Services

⇒ Core services lie above the core OS layers.

⇒ They help in providing enhanced services which are implemented and controlled by the core OS layer.

⇒ The core OS and core services together provide the most of the application based services for iOS devices.



* Motion based service: It helps to maintain and analyse the motion of the device.

* Location-based service: Provides the location and its details using GPS in device.

* Camera based service: This service helps to take images and apply different works on it in iOS devices.

(iii) Media Layer

⇒ This layer is responsible for audio and videos in iOS devices.

⇒ Most of the graphical based services are provided in this layer.

* OpenGL kit: Provides the graphics based libraries and functionalities.

* UI kit: Provides functionality from 2D vectors and other graphics based data structures.

* Cocoa Touch Provides the interface and SST
design of web and internet in user friendly manner.

(iv) Cocoa Layer

⇒ This is the topmost layer in iOS architecture

⇒ This is the application layer for iOS devices

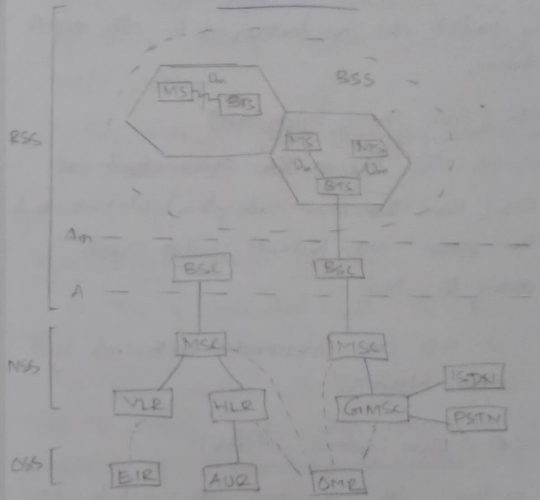
⇒ Applications are maintained and used using the user friendly GUI and services and functions are maintained from the respective layers.

⇒ For an application that takes photos, it can be accessed from the GUI.

⇒ After accessing, core service layer helps to provide the access and handling of device camera.

⇒ After taking images or videos, editing can be done from the services provided by UIKit, openGL kit etc from media layer.

10 Components of GSM Architecture SST




(1) Radio Sub system

This maintains the radio activities of the devices in GSM.

MS (Mobile Station) SSN

This is where calls and radio signals are handled and are handovered to other mobile stations.

BSS (Base Service Subsystem)

⇒ This has a radio service known as BTS (Base Transceiver Subsystem) which is used to receive and transmit radio signals among the MS.

⇒ BTS are interconnected with MS by Um interface.

BSC (Base System Controller)

⇒ They are connected with multiple BTS via the Abis interface.

⇒ They control all over the available BTS in the BSS network.

(5) NSS (Network and Switching Subsystem) SSN

⇒ This layer helps in networking and switching of routers among different devices and mobile stations.

⇒ They also help in identifying users via SIM, ~~IMEI~~ IMEI and IMSI for registration of users into the GSM network.

MSC (Mobile Station Controller)

⇒ This is connected with the BSC via the A interface.

⇒ MSC handles all the BSC available in the cell to manage and control networking and switching of routers and controllers.

HLR (Home Location Register)

It is used to store the location information about the device in a permanent database for various use cases.

VLR (Virtual Location Register)

It is used to store temporary location details of the devices in order for more efficiency.

(iii) OSS (Operation and Service Subsystem)

This handles all the operations and services maintained and created by other components.

AUC (Authentication Universal Register)

⇒ This component is used for authentication purpose of device GSM network.

→ AUC uses A3 algorithm for authentication and A5 algorithm for encryption.

→ SIM is protected with the help of PIN.

OMC (Operation and Management Resource)

It helps in maintaining and managing the resources efficiently and fairly to users more features and implement different operations.



PART-B

(8) Security Services of GSM

⇒ Authentication:

* Authentication service is provided for users to enter into the GSM network.

* It can be implemented with the help of SIM (Subscribers Identification Module) with the help of PIN numbers.

⇒ Confidentiality:

* Confidentiality is maintained by making suitable encryption algorithms with unique cipher keys.

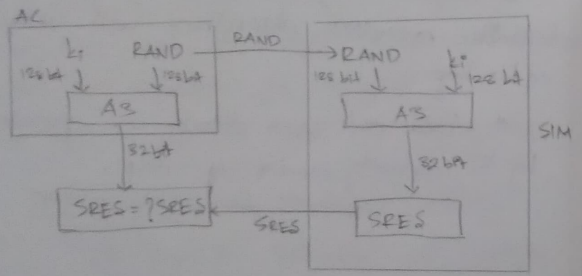
* Data and user details are protected by the security services of GSM.

## ⇒ Anonymity:

* User can be made anonymous by suitable services which are secure and implemented using different encryption algorithms and authentication mannors.

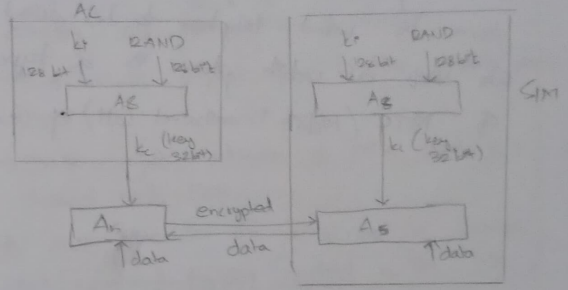
A3 algorithm → authentication purpose
A5 algorithm → for encryption
A8 algorithm → Generate cipher keys

### Authentication



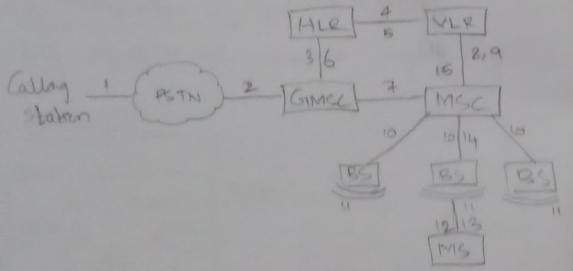



## Encryption



(7)

⇒ A person making a call from his wired telephone to his friend who uses a mobile phone is a type of MTC (Mobile Terminated Call) of GSM.




⇒ The calling station gives the call request to the PSTN.

⇒ From the PSTN, call request is forwarded to GMSC (Gateway Mobile Service Control)

⇒ From the gateway, request for locating call from MSC is made.

⇒ So HLR requests for location details from VLR.

⇒ VLR gets address of MSC and is stored with HLR.

⇒ HLR provides the response to GMSC and GMSC makes contact with MSC.

⇒ MSC then broadcasts the call requests to all available Base stations (BS).

⇒ After validation in BS, call is finally forwarded to the mobile station which knows the location of the receiver side.

⇒ In this way, mobile terminated call is handled in GSM.

(1) Limitations of GSM

⇒ Limited capacity of devices in a cell

⇒ More devices in GSM network affects network bandwidth

⇒ Errors may happen while handover from one cell to another.

(2) Teleservice for subscribers:

→ PSTN

→ ISDN

→ GMSC

(3) Mobile originated call (MOC) SSN 17

⇒ It is a type of call in GSM in which call is made from us to the receiver end.

⇒ In other words, call is originated from users side and goes to the receivers side.

(4) Mobile OS

The operating system which is used to ~~connected~~ connect the hardware features with the applications on a mobile device is known as Mobile OS

Eg: iOS, Android.

(5) Benefits of Layered architecture

⇒ Each layer can handle different services

⇒ Error or problem in one layer will not affect another layer

⇒ Updates can be easily made for repetitive layers.

6 Android SDK:



⇒ It is defined as the library required for Android Runtime environment to run android applications in editors such as Android Studio.

⇒ SDK stands for Software Defined Kit.

9 Linux Kernel in Android



⇒ Linux kernel is the inner most layer in Android architecture.

⇒ It helps to serve applications by running kernel level operations.

⇒ Linux kernel maintains a virtual machine known as DLV for easy rendering of android applications on devices.

⇒ Linux kernel can interact with the higher level components by using system calls to the above subsequent layers in Android architecture.

⇒ Linux kernel plays important role for the Android runtime environment which handles the applications and run them efficiently managing resources.