ASSIGNMENT

Course no : CSE 3217

Course title : Mobile Computing

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Answer to the ques no – 1 (a)

Mobile Computing:

Mobile computing is a technique ~~where~~ by which mobile users can have a taste of using a computer while on the move.

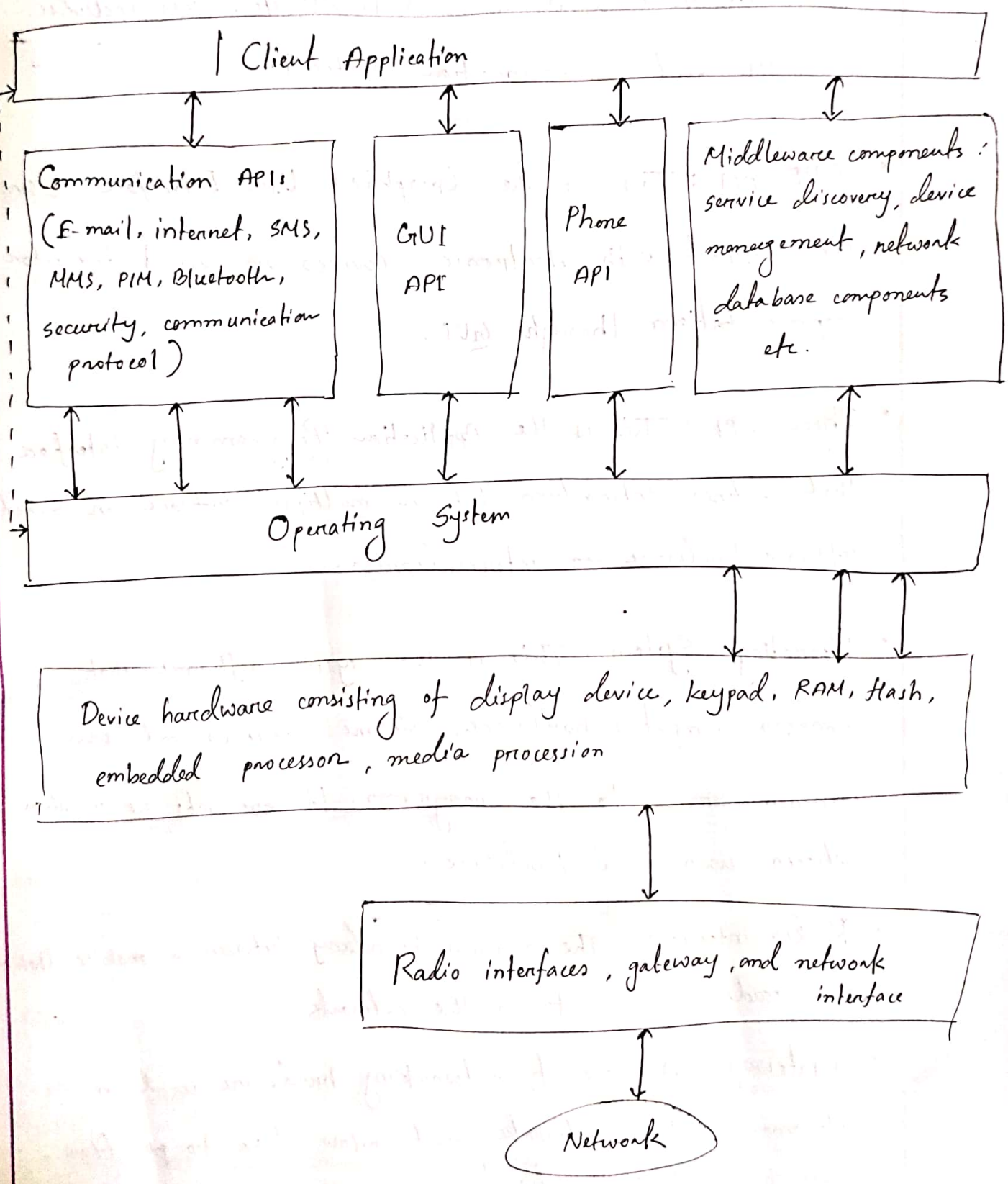
A computer or laptop is not portable everywhere. But people need these devices as technology is thriving everyday. Thus, the need for mobile computing arose so people can run some necessary apps and features using only their mobile devices no matter wherever they are. This is mobile computing and it's a wireless communication system.

Mobile Computing Devices:

- Tablet PC
- Smartphones
- E-readers
- Portable media player
- Laptop computer
- Handheld gaming devices etc.

Answer to the ques. no - 1(b)

⊕ Mobile Computing Architectural Layer :



- Client Application : The application used by front-end users.
- Communication API : The means with which users communicate with each other such as e-mail, SMS etc. This includes security and communication protocol.
- GUI API : This is the Graphical User Interface. Users can interact with electronic devices via visual indicator representation through GUI.
- Phone API : This is the Application Programming Interface that defines interaction between multiple software or mixed software-hardware ~~so~~ intermediaries.
- Operating System : This is the system software that manages computer hardware, software resources and provides common service to the programs. It ~~or~~ sets up relation between user and hardware.
- Radio interface : The common boundary between a mobile station and radio equipment in the network.
- Gateway : A piece of networking hardware used in telecommunication networks that allow data to ~~go~~ flow from one discrete network to another.

- Network : Wireless network makes things possible for mobile devices to use the applications and above stated features.

Answer to the ques no. 2 (a)

A sensor is a device, module, machine or subsystem whose purpose is to detect events or changes in its environment and send the information to other electronics, specially to a computer processor.

In a smartphone, there are various sensors clustered together to do various tasks. Some of the sensors are stated below:

- GPS or Global Positioning System is a satellite based navigation system which helps the users to detect outdoor locations.
- Accelerometers : Used ~~fo~~ for measuring proper acceleration while user is on the move.
- Gyroscope : This sensor is used for game controls to maintain orientation and angular velocity
- Proximity sensor : Used to detect objects nearby.
- There are other sensors to measure temperature, heart beat and more.

All these sensors are used in a mobile device in a way that the individual presence of the sensors can be neglected. It seems that the mobile device is working as all the sensors at a time. Therefore, it can be said that a smart phone also acts as several sensors.

Answer to the ques no- 2 (b)

ARMs or Advanced RISC Machines are considered to be family of ~~centr~~ CPUs that are used in low power consuming devices. ARM processors runs multiple processes simultaneously, so it needs to switch between operating modes to give service to different kind of processes. There are seven basic operating modes of ARM processors:

- User mode : This is the basic mode where application programs run. User mode is the only unpriviliged mode, and it has restricted access to system resources. Typically, a processor spends 99% of its time in user

mode:

• System mode : This mode provides unrestricted access to all system resources. It is used only when needed. Only system software is allowed to run in system mode. It typically manages user ~~soft~~ applications and allocates shared resources like memory or data ports. System software run mostly in user mode but when needed, it can switch modes ~~to~~ only when strictly necessary.

• Supervisor mode: This mode also provides unrestricted access to all system resources and is entered ~~only~~ on reset or power up, or when a software ~~calls~~ executes a Supervisor Call instruction (SVC). Supervisor mode is similar to system mode but provides access to a few more registers.

• FIQ mode : This mode is entered in response to a fast interrupt request from an external device.

• IRQ mode : This mode is entered in response to a normal ~~request mode~~ interrupt request.

• Abort mode: This mode is entered when program attempts to access a non-existing memory location.

• Undefined mode: This mode is entered for any

instruction-related exceptions, including any attempt to execute an unimplemented instruction.
