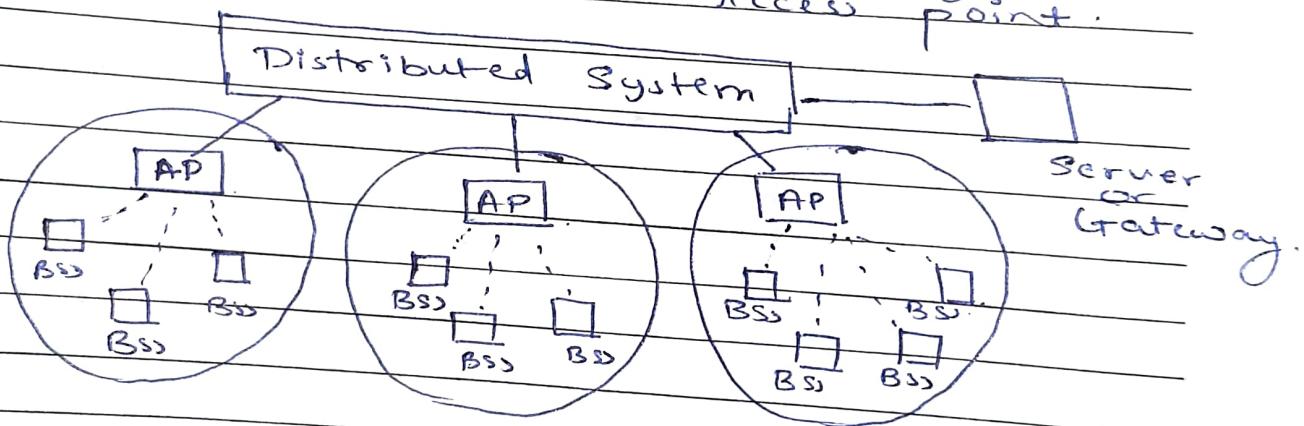


Roll No. in Fig.: 3733
 End Semester Examination: 2020-21
 Class- FINAL Year B Tech(IV) Branch.. COMPUTER... SCIENCE
 Course Code and Name: CS411 MOBILE COMPUTING
 Enrollment Number: 2017/CTAE/152
 Semester - First
 Signature Jayesh Budhwani

Ans 7. (a) WLAN is a technique of designing and arrangement of different components in wireless LAN in a specific way. Special type of device which is the combination of transmitter and receivers called as transceivers. is an essential part of WLAN Architecture Known as Access point.



AP: Access point, BSS: Basic Service set.

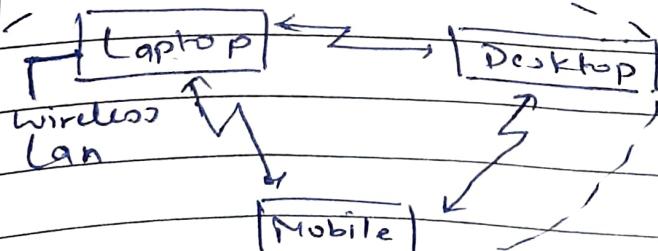
Components of WLAN Architecture:-

- ① Access point:- A special type of routing device that is used to transmit data.
- ② Clients:- The different devices that need the attention of an access point / Server.
- ③ Server:- The device that provides the services.
- ④ Bridge:- The special type of connector that connects wired and Non-wired / wireless part of the Network ..
- ⑤ It also connects BSS to AP etc.

Ans

(b) → Ad-Hoc Networks also Known as MANETS does not rely on pre existing infrastructure such as routers in wired networks or access point is managed by wireless networks. Each node/nodes participates in routing by forwarding data to other nodes, so the determination about which node to send data is made dynamically on the basis of Network connectivity and the routing algorithm used in wireless mobile ad-hoc networks are self-configuring dynamic networks in which nodes are free to move.

- A true Ad-hoc network uses multicasting, Not unicasting or broadcasting.
- A true ad-hoc network does not require any access point like as other Networks require a backbone called distributed system which connects different access points.



A Simple adhoc Network without any access point.

- Application.
- ① PAN. (personal Area Network).
 - ② Military
 - ③ Medical Application
 - ④ In time of Crisis.

Ans 8

(a) There are various IEEE 802.11 standards.

Some of which are:-
Standard.

- (1) IEEE 802.11a Extension of IEEE 802.11, goes upto 54 Mbps in the 5-GHz band And it uses orthogonal frequency division multiplexing (OFDM).
- (2) IEEE 802.11 b Speed upto 11 Mbps in the 2.4 GHz band. It uses only DSS.
- (3) IEEE 802.11g Wireless lan and provider. 20+ Mbps in 2.4 GHz band.
- (4) IEEE 802.11c Bridge operation procedures.
- (5) IEEE 802.11e Enhancement Dos including packet bursting.
- (6) IEEE 802.11 h Spectrum merged (5GHz) for european compatibility.
- (7) IEEE 802.11 i Enhanced security.
- (8) IEEE 802.11 j Extension for japan.
- (9) IEEE 802.11k Radio Resource Measurement Enhancement
- (10) IEEE 802.11n Higher throughput enhancement using Multiple Input, multiple output.
- (11) IEEE 802.11aa Robust streaming of audio and video.
- (12) IEEE 802.11 mb Maintenance of the standard.
- (13) IEEE 802.11ad Very high throughput of 60 GHz.

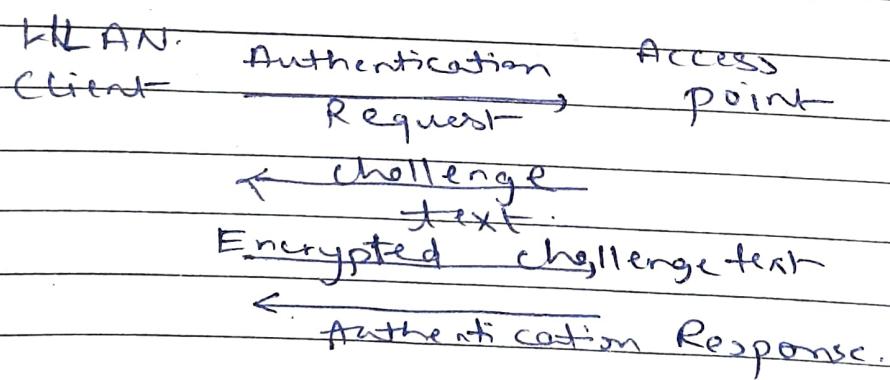
Roll No. in Fig.: 3733

Signature.....
Sayon Banerji

Ans 8 (b) WLAN Security protocols are:-

(i) Service Set Identifiers (SSID):- It is the network name (Id of BSS or cell) that identifies the area covered by Access point. Access point regularly broadcasts the SSID. If the SSID is not known, management frames sent to the AP from the wireless station will be rejected.

(2) MAC Address Control:- Access points support MAC Address filtering, similar to IP filtering. The access point merges the list of MAC addresses that are allowed or disallowed in the wireless Network.



(3) Wired equivalent privacy (WEP):- protocol from casual eavesdropping with following facilities:

- (i) Reasonably Strong encryption.
- (ii) Self Synchronizing.
- (iii) Efficient.
- (iv) Exportable.

Ans 2

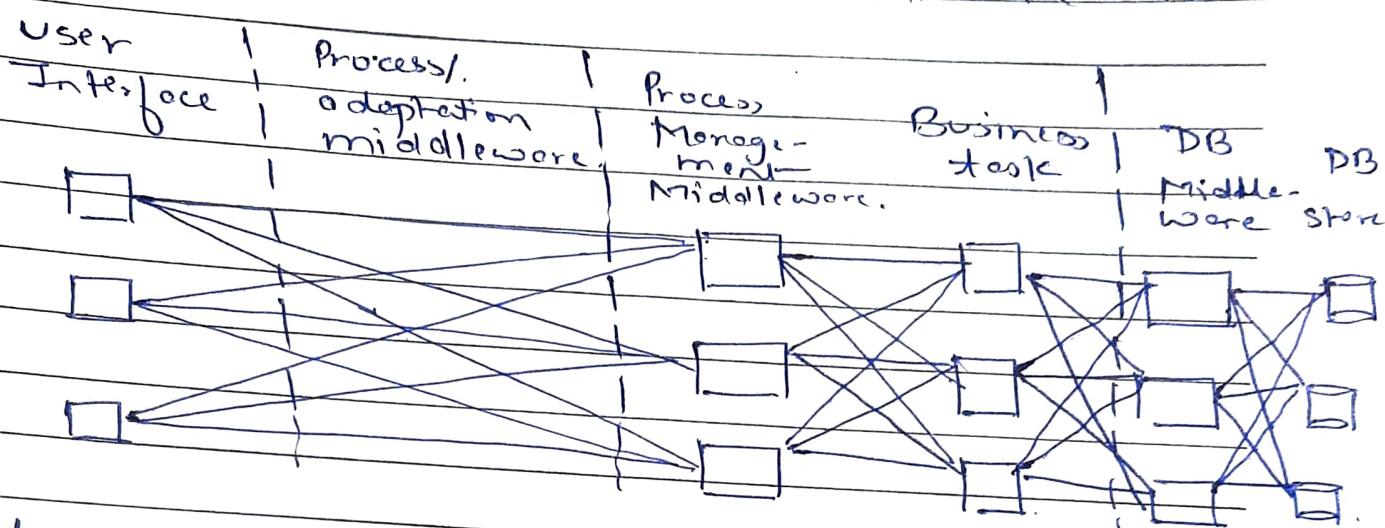
(a) Mobile IP Signifies that while a user is connected to application across the Internet and the user's point of attachment changes dynamically, all connections are maintained despite the change in underlying Network properties. It allows the mobile node to use two IP addresses. Called home address, and Care of address.

→ Home address is static and does not change while Care of address changes at each new point of attachment. and can be thought of Mobile phone location Specific address.

Tunneling :- It establishes a virtual pipe for the packets available between tunnel and an end endpoint. This is the process of sending a packet via a tunnel and it is achieved by a mechanism called encapsulation. It takes place to forward an IP datagram from the home agent to the Care of address. Whenever home agent receives a packet from correspondent node, it encapsulates the packet with source address as home address and destination as care of address.

Ans 2

(b) The Architecture of Mobile Computing consists of three layers hence it is called as 3-tier architecture.



Layers:-

(1) Presentation tier:-

- Responsible for presenting information to end user.
- Runs on client device and offers the user interface, includes web browsers. Ex:- HTML Browsers and client programs.

(2) Application tier:-

- Independent of presentation and data base management, handles functions of middleware.
- Middleware:- layers of software sitting between the operating System and user interface i.e. user.

(3) Data tier:-

- used for storing data needed by the application and acts as a repository for both temporary and permanent data.
- Can use XML, might incorporate the use of database Middle ware and SyncML.

Ans 1

(a) Mobile Computing can be defined as a computing environment over physical mobility.

In Mobile Computing the user should be able to access data, information or other logical objects from any device in any Network while on the move.

The Communication bearer should be spread over both-wired and wireless media.

Should allow user to perform any task from anywhere.

There are various applications of mobile computing like.

- ① Personal (wallet, diary etc.)
- ② Entertainment (fun, games, movies etc.)
- ③ Corporate (ERP, inventory, business alerts)
- ④ Location specific (restaurant guide, maps)
- ⑤ Transaction oriented (bank transactions, mobile shopping e-commerce etc)
- ⑥ Perishable (news, sports, stock quotes etc)
- ⑦ personal ()

Examples:-

→ traffic = done using help of mobile computing.

→ Weather = also done using Mobile Computing.
 → Corporate applications, On-broker, telebanking, m-shopping, e-governance, community forums, Virtual Laboratories, downloads etc.

- Ans1 (b) The following are the design considerations of mobile Computing:-
- Context information is the information related to the surrounding environment of an actor in the environment.
 - Mobility implies that attributes associated with devices and users will change constantly.
 - Such changes shall mean that context and behaviour of applications should be adapted to suit the current situation.
- Concerning Contexts in Mobile Computing:-
- | | |
|-------------------------|-----------------------|
| (1) User Context | (2) Device Context |
| (3) Network Context | (4) Bandwidth Context |
| (5) Location Context | (6) Time Context |
| (7) Environment Context | (8) Charging Context |
| (9) Security Context | |

There are many ways in which contexts can be adopted,

- Content with Context Awareness.
- Content switch on context.
- Content Transcoding on context.

Also, Client Context manager, Policy manager, Semantic web, Security manager, adaptation manager, Content Rating and Filtering are used for design considerations to manage contexts.

Ans 5 (b) Difference between CDMA & GSM.

(a)

GSM.

(Global Sys. for Mobile com)

① Based on edge Spectrum Called Barrier

② Operates in 850 to 1900 MHz.

③ Used over 80% of world's Network

④ Maximum download speed of

⑤ FDMA and TDMA used.

⑥ 42 Mbps in HSPA (3G)

⑦ Data and voice both can be transmitted at once.

⑧ Customer's information stored in SIM Card.

⑨ less Security

⑩ No built encryption

⑪ Signals can be detected easily in GSM.

CDMA.

(Code division multiplexing)

① Based on Spread Spectrum Technology

② Operates on 850 - 1900 MHz.

③ Exclusively used in US, Canada, Japan.

④ CDMA used.

⑤ 3.6 Mbps in CDMA.

⑥ Does not support this feature.

⑦ Customer's information stored in handset phone

⑧ More Security.

⑨ It has built encryption

⑩ Signals cannot be detected easily.

Ans. (a) WAP (wireless application protocol)

Commonly known as wap is used to enable the access of internet in the mobile phones or PDAs.

It is an open, global Specification that empowers mobile users with wireless devices to easily access and interact with internet information and services instantly.

It is an Application Communication Protocol used for handheld devices such as mobile phones.

enables creation of web applications for mobile devices.

uses WML (markup language Not HTML)

Aim of wap is to produce web like experience for small portable devices.

To enable easy, fast delivery of relevant information and services to mobile users.

Applications:-

- ① Corporate Applications
- ② Online Services (Banking, electronic Commerce)
- ③ Tele Services (Prepaid Services)
- ④ Personal productivity (Email)
- ⑤ Interactive chat
- ⑥ Auction
- ⑦ Games.