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CLASS:- B.E-4

ROLL NO:- 04

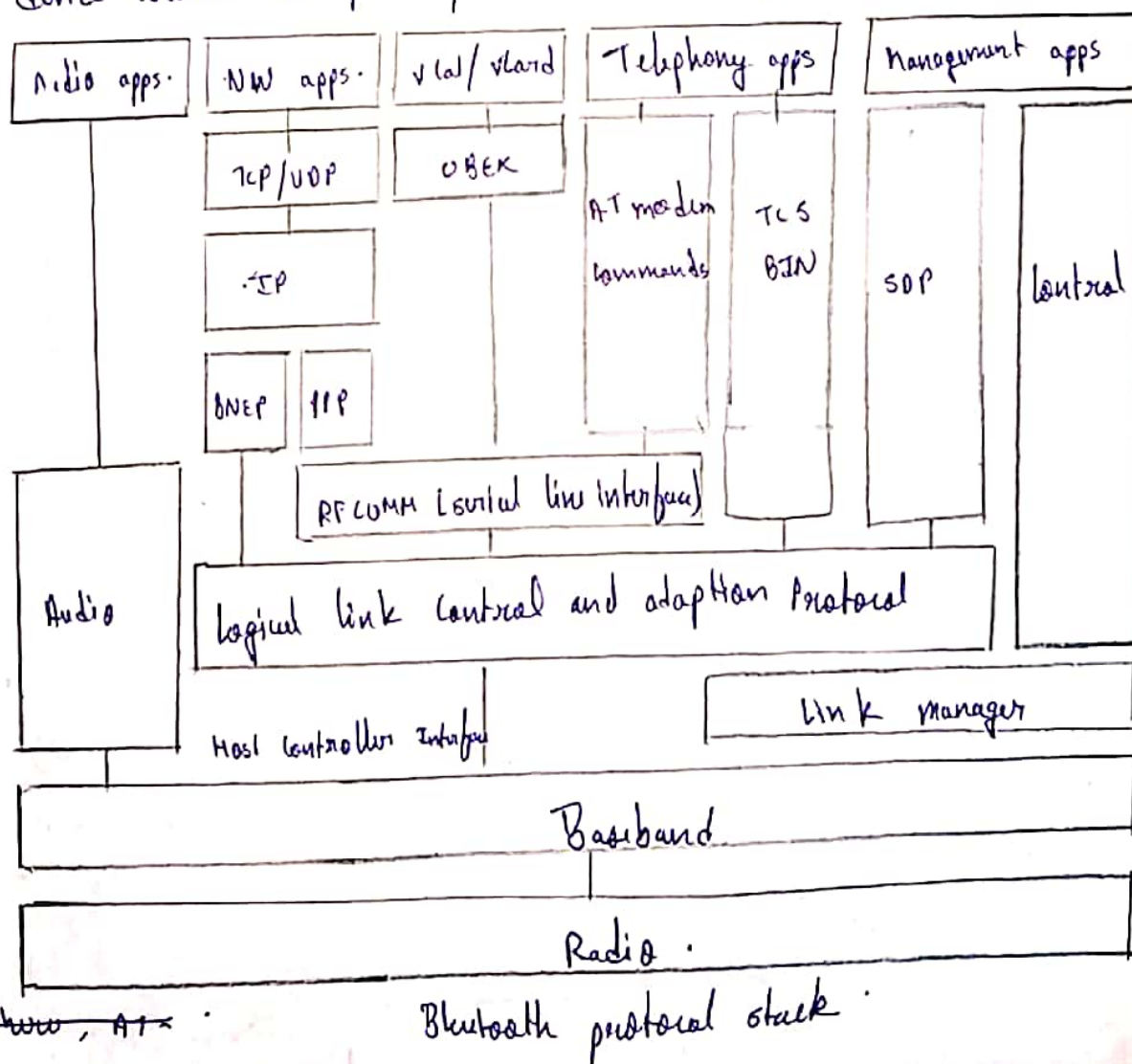
BATCH:- A.

SUBJECT:- MCC ASSIGNMENT :-2-

Q.1. Define piconet. Describe Bluetooth protocol stack with the help of diagram.

Piconet.

- ① Piconet is a collection of Bluetooth devices which are synchronized to the same hopping sequence.
- ② Each piconet has one device called Master (M). All other devices called slaves (S) are connected to master.
- ③ The master determines the hopping sequence in the piconet and all slaves have to synchronize to this pattern. If a device wants to participate it has to synchronize to this.



where AT - Attention Sequence

OBEX - object - exchange

TCS BIN - Telephony control protocol specification - binary.

Radio Layer.

- (i) Radio Layer defines the carrier frequency and output power.
- (ii) Bluetooth uses 2.4 GHz license free band.
- (iii) It uses 79 hop carrier equally spaced with 1MHz.
- (iv) Gaussian FSK used for modulation.

Baseband Layer.

- (i) Define physical links and many packet formats.
- (ii) Baseband layer perform freq. hopping to avoid interference and to access the medium.
- (iii) It controls:
 - ① Device addressing
 - ② Power-saving operation
 - ③ Flow control and synchronization among Bluetooth devices.

Link Manager Protocol (LMP)

- (i) The LMP manages various aspects of the radio link b/w master and slave.
- (ii) The following func. covered in LMP.
 - ① Authentication, pairing & encryption.
 - ② Capability negotiation.
 - ③ Synchronization.
 - ④ Link supervision.
 - ⑤ State and Transmission exchange.

Logical Link Control and Adaptation Layer (LLCAP)

- (i) LLCAP is layered over the Baseband Protocol and resides in the data link layer.
- (ii) LLCAP provides:
 - ① Group abstraction
 - ② Segmentation and reassembly operation.

③ Connection-oriented and connectionless data services to upper layer protocol with protocol multiplexing capability.

Host Control Interface (HCI) .

- (i) The HCI provides a command interface to the baseband controller and link manager.
- (ii) It provides access to hardware status and control registers.
- (iii) The HCI exists across 3 sections, The Host, Transport Layer, Host Controller.
- (iv) HCI can be seen as software/hardware boundary.

RF COMM .

- (i) RF COMM protocol provides emulation of serial ports over the L2CAP protocol.
- (ii) The protocol is based on the ETSI standard TS 07-10.
- (iii) It supports multiple single port over a single physical channel.

Service Discovery Protocol (SDP) .

- (i) The SDP helps the application to discover which services are available and to determine the characteristics of those available services.
- (ii) SDP defines only the discovery of services not about their usage.
- (iii) New services is discovered as follows.
 - ① Client sends a request to search for an interested services.
 - ② The client use this list to retrieve additional service attribute for the service of interest.

Q.2. Draw and explain basic architecture of HAWAII .

Answer:-

- (i) HAWAII (Handoff-Aware Wireless Access Internet Infrastructure) tries to keep micro-mobility support as transparent as possible for both home agent and MN.

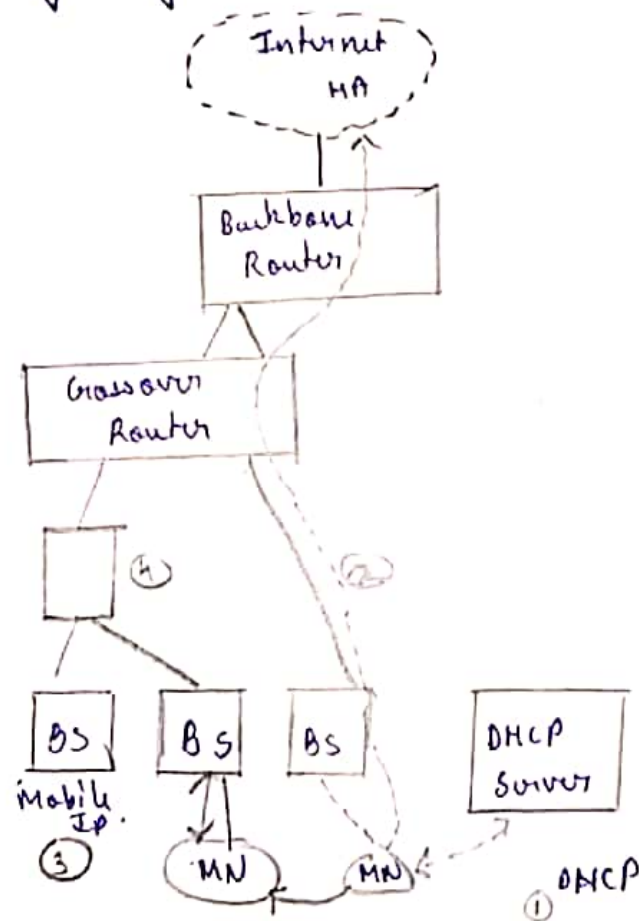
Working:-

Step 1:- On entering an HAWAII domain, a mobile node obtains a co-located COA.

Step 2:- MN registers with the HA.

Step 3:- When MN moving another cell inside the foreign domain the MN sends a registration request to the new base station as to a foreign agent.

Step 4:- The base station interprets the registration request and sends out a handoff update message, which reconfigures all routers on the paths from the old and new base station sends a registration reply to the MN, again as if it were a foreign agent.



Basic structure of HAWAII

Q.3. What is EPS? Name the various Entity in detail.
Explain Mobility Management

Answer

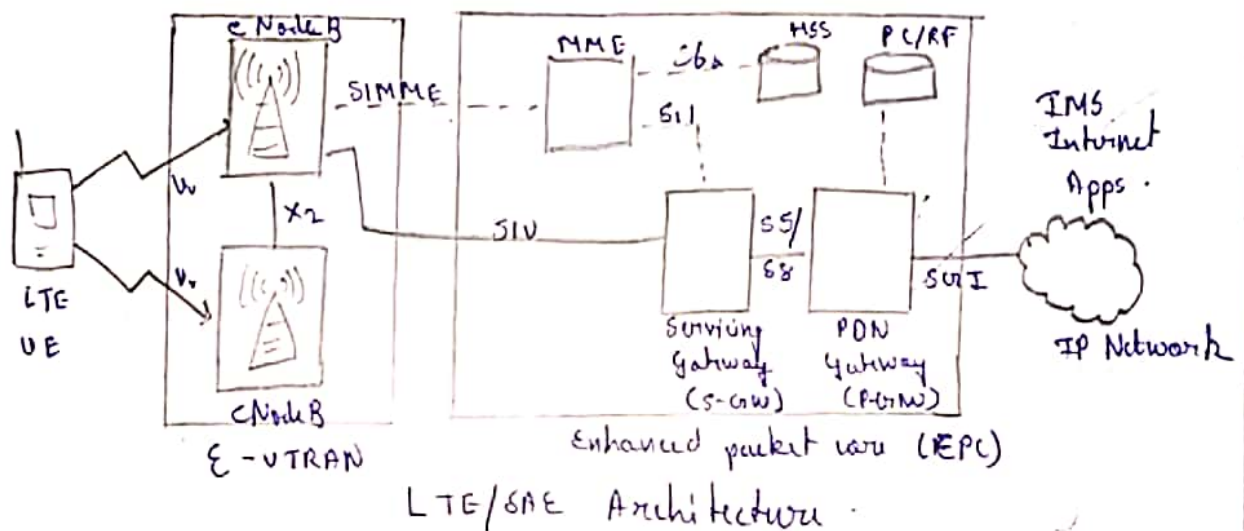
(i) EPS stands for Evolved Packet System.

(ii) It includes the Evolved Packet Core (EPC), the Radio Network

- (E-UTRAN) is the End User Equipment (UE) and the Services.
- (ii) EPS is the based system entirely on packet switching. unlike legacy UMTS and GSM technology that still uses circuit switching.

MME

- (i) The MME (Mobility Management Entity) deals with the control plane.
- (ii) It handles the signaling related to mobility and security of E-UTRAN access. The MME is responsible for the tracking and the paging of UE in idle-mode. It is the termination point of the Non-Access Stratum (NAS).



Q.4. What is self-organizing Network (SON). Explain in detail.

Answer:-

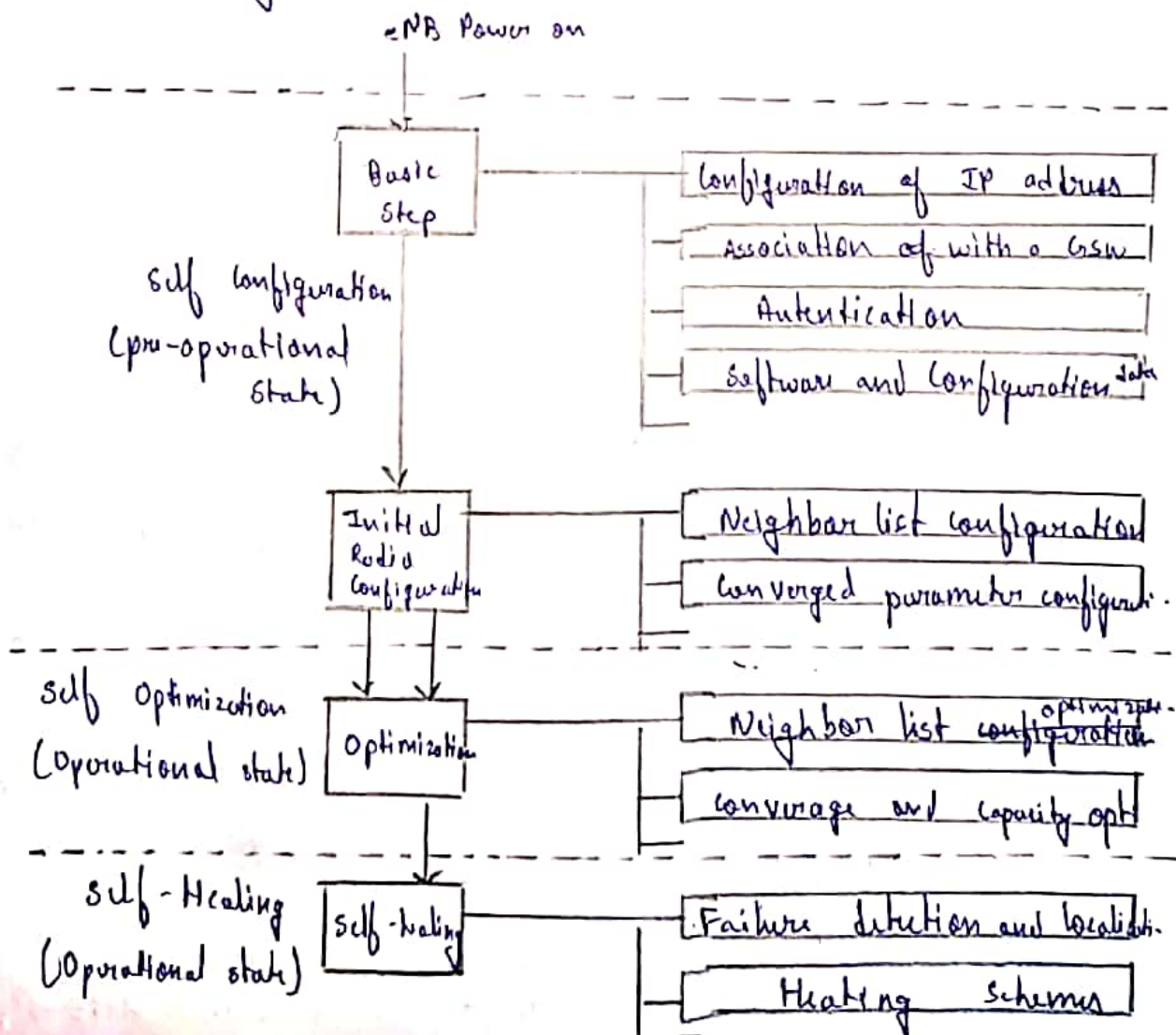
- (i) SON stands for Self Organizing Network.
- (ii) It means that just add an eNB wherever you want to put and adjust connect power and switch on, it would configure all of its configuration by itself and make itself ready for services.
- (iii) SON is like 'Plug and Play' function.
- Construction steps:
- ① Network Planning.
 - ② Bring the hardware (eg. eNB) to the location determined at Network Planning Process.

- ⑤ Hardware Installation
- ④ Basic Configuration.
- ③ Optimizing parameters.

cv) The main goal of SON is to automate large portion of human efforts involved in a above mentioned process.

SON Architecture.

- i) The self-organizing functionality can be located at one place even split in different nodes.
- ii) Self-Optimization algorithms can be located in OPM or eNB or both of them.
- ciii) SON can be divided into the three main architecture.
 - ① Centralized SON
 - ② Distributed SON
 - ③ Hybrid SON.



SON Framework -