VELAMMAL COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
IT6601-MOBILE COMPUTING
QUESTION BANK

UNIT II - MOBILE TELECOMMUNICATION SYSTEM

Introduction to Cellular Systems - GSM – Services & Architecture – Protocols – Connection Establishment – Frequency Allocation – Routing – Mobility Management – Security – GPRS- UMTS – Architecture – Handover - Security .

PART-A	
Sl.NO	Question
1.	**Define GSM** Global System For Mobile Communication (GSM) is the second generation telecommunication System. . It is used by over 800 million people in more than 190 countries. GSM permits the integration of different voice and data services and the interworking with existing networks.
2.	**List out the Bearer Services provided by GSM** **Transparent bearer services** • use the functions of the physical layer (layer 1) to transmit data • Transmission quality can be improved with the use of **forward error correction (FEC)** **Non-transparent bearer services** • use protocols of layers two and three to implement error correction and flow control.
3.	**Name the Tele Services provided by GSM** • Emergency number • Short message service (SMS) • Enhanced message service (EMS)
4.	**List out the Supplementary Services provided by GSM** User **identification**, call **redirection**, or **forwarding** of ongoing calls, barring of incoming/outgoing calls, Advice of Charge (AoC) etc. Standard ISDN features such as **closed user groups** and **multiparty** communication may be available.
5.	**What is BSS?** A GSM network comprises many Base Station Sub System BSSs, each controlled by a base station controller (BSC). The BSS performs all functions necessary to maintain radio connections to an MS, coding/decoding of voice, and rate adaptation to/from the wireless network part. Besides a BSC, the BSS contains several BTSs.
6.	**What is BSC?** **Base Station Controller (BSC)** provides all the control functions and physical links between the MSC and BTS. It is a high capacity switch that provides functions such as handover, cell configuration data, and control of radio frequency (RF) power levels in BTS. A number of BSC's are served by and MSC

7.	**What is MSC?** An MSC(Mobile Switching Centre) is considered to form the heart of the GSM network. An MSC set up connections to other MSCs and to other network such as Public Data network

	(PDN). An MSC is responsible for connection setup, connection release and call handoff to other MSCs.
8.	**What is the purpose of GMSC?** A Gateway MSC (GMSC) is responsible for gateway functions, while a customer roams to other networks. It connects external networks such as PDN with the GSM. It also performs certain other supplementary services such as call forwarding, multiparty calls etc..
9.	**What is the purpose of HLR and VLR?** **Home location register (HLR):** It is a database used for storage and management of subscriptions. HLR stores permanent data about subscribers, including a subscribers service profile, location information and activity status. When an individual buys a subscription from the PCS provider, he or she is registered in the HLR of that operator. **Visitor location register (VLR):** It is a database that contains temporary information about subscribers that is needed by the MSC in order to service visiting subscribers. VLR is always integrated with the MSC. When a MS roams into a new MSC area, the VLR connected to that MSC will request data about the mobile station from the HLR. Later if the mobile station needs to make a call, VLR will be having all the information needed for call setup
10.	**List 3 important features of GSM Security** • Access control and Authentication • Confidentiality • Anonymity
11.	**Define GPRS** The **general packet radio service (GPRS)** provides packet mode transfer for applications that exhibit traffic patterns such as frequent transmission of small volumes (e.g., typical web requests) or infrequent transmissions of small or medium volumes (e.g., typical web responses) according to the requirement specification
12.	**What are the services provided by GPRS.** GPRS offers end-to-end packet switched data transfer services which can be categorized into the following two types (i) **Point-to-Point service** It is between two users and can be either connectionless or connection-oriented (ii) **Point-to-Multipoint (PTM) service** Data service from one user to multiple users.Two types of PTM services are there

13.	**What are the advantages of GPRS?** The main advantages of GPRS includes • machine to machine data communication • Lower service charges • Compatible with e-mail • Broadcast Services • Web Browsing
14.	**Mention the limitations of GPRS** • Reduced Cell Capacity • Transit delay • No store and forward mechanism
15.	**How UMTS networks are different from 2G networks**.
	• Higher Speech quality • Higher data rate • Virtual home Environment
16.	**What is virtual Home Environment?** A user roaming from his network to other UMTS networks will not feel any discontinuity or service difference, thus giving a feeling of being in the home network
17.	**What are the main elements of UMTS** The Main elements of UMTS network architecture are • User Equipment • Radio Network Subsystem • Core Network
18.	**What is software Defined Radio(SDR)** An SDR is essentially a software technique for handling radio signals. It is a radio whose some or all functions are implemented through programmable processing techniques. The programmable processing techniques include Field programmable Gate Arrays(FPGA), Digital Signal processors(DSP), General Purpose Processors(GPP) etc.

PART-B		
Sl.NO	Question	Marks
1.	Describe GSM Architecture and its services in detail	13
2.	Explain in detail about GSM Protocols with neat sketch	13
3.	Explain how Localization of user is achieved in GSM	5
4.	Explain in detail about mobile Terminated Call and Mobile Originated call	13
5.	Explain in detail about handovers of GSM	13
6.	Explain GSM Authentication and security	13
7.	Explain GPRS and its protocol architecture	13
8.	Explain in detail about UMTS Architecture	13
9.	Explain how handover and security handled in UMTS	13