

M.Sc. Semester-II Examination 2017

**Computer Science
Course : MCSC-25
(Wireless Network)**

Time : 3 Hours

Full Marks : 40

Questions are of value as indicated in the margin

Answer question number **1** and **any three** from the rest

1. Write the sequence of events in the following scenarios:

- (a) UE is powered-on with automatic network selection mode. The screen shows “Emergency only”.
- (b) UE makes a voice call to some other MSISDN. The user gets a response that “the number you are calling is not reachable at the moment”.
- (c) An user is on 3G voice call while travelling in a train. The call suddenly gets dropped, and a few moments later a new 2G network name shows up on the screen. 4+3+3=10

2. (a) There are three PLMNs, namely plmn2, plmn3 and plmn4 in an area. The carrier frequencies of the PLMNs are as follows : plmn2 (2 3G carriers + 4 GSM carriers), plmn3 (1 3G carrier + 5 GSM carriers) and plmn4 (7 GSM carriers). A 3G UE is configured in (3G + GSM) mode of operation and supports one 3G and 3 GSM frequency bands. Preferred technology = 3G. RPLMN = HPLMN = plmn1 for the UE. The UE takes approximately 3 seconds to complete reading its SIM, 2 sec and 1.5 sec to completely scan a particular 3G and 2G frequency band respectively for finding cells, approximately 230 ms to read PLMN Id from BCCH data from a GSM cell and approximately 80 ms to read PLMN Id from BCCH data of a 3G cell. Fetching complete BCCH info from a 2G and 3G cell takes approximately 1.2 sec and 640 ms respectively. Each registration attempt takes approximately 5 sec to get completed. Find the elapsed time between powering ON the UE and plmn4 showing up on the screen after failure of registration attempts on plmn2 and plmn3. Plmn2, 3 and 4 are not part of preferred PLMN list for user/operator [*Hint would be given on request during the examination with penalty of 2 marks.*]

- (b) What is the use of VLR? 8+2=10

3. (a) Briefly illustrate how a particular UE is located from the supplied MSISDN during incoming call.

- (b) “Missed calls are wastage of resource from an operator’s point of view”. Justify. 6+4=10

4. (a) Briefly describe the GPRS core network subsystem.

- (b) Briefly describe the PDP context activation procedure.

- (c) What is the use of LLC sublayer in GPRS over GSM? 4+3+3=10

5. (a) Minimally, how many scrambling codes are to be used in the downlink of a 3G cell if 2 channels with SF = 4, 4 channels with SF = 8, 8 channels with SF = 16 and 15 channels with SF = 32 should be configured in a 3G cell (in addition to 4 common channels with SF=256 which necessarily use primary scrambling code)? Show the code allocation for your answer.

- (b) Illustrate how variable rate transmission over multiple radio bearers is achieved using TFS and TFCS. 5+5=10

6. (a) Briefly mention the enhancements made in HSDPA over basic 3G channels to achieve better throughput and higher data rates.

- (b) Differentiate between soft and hard handover.

- (c) Why is the LLC sublayer not required for GPRS over 3G?

- (d) What is SRNS relocation? 3+2+3+2=10
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