U.S.N | | | | | | | | |

P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Seventh Semester, B.E. - Electronics and Communication Engineering
Semester End Examination; Dec - 2017/Jan - 2018
GSM Communication and Networks

Time: 3 hrs   *Max. Marks: 100*

Note: Answer **FIVE** full questions, selecting **ONE** full question from each unit.

UNIT - I

1 a.	How spectacle efficiency of modulation is defied in terms of Erlongs / MHz / km^2? What are the important inferences made regarding this equation?	10
b.	Explain how co-channel interference reduction is possible using directional antennas (Assume 120º sectorized cell sites).	5
c.	Consider a GSM system with a one way spectrum of 12.5 MHz channel spacing 200 kHz. There are three control channels/cell and the reuse factor is 4. Assuming Omni directional antenna with 6 interferences in the first tier and a slope for path loss of r = 4, calculate the numbering cells / cell site / hr with 2% blocking system busy hour and an average call holding time of 120 seconds. Assuming traffic load of 110 Erlongs, also find S/I ratio.	5
2 a.	In a GSM 900 digital channelized cellular system, the one way b.w. is 12.5 MHz. Channel spacing is 200 kHz. Eight users shares each channel and three channels / cell are used (reserved) for control. Calculate spectral efficiency, assuming Omni directional cells, Area of a cell = 8 km^2, total coverage area = 4000 km^2, Average number of calls / user devices the busy hour = 1.2, Average holding time of a call = 100 secs, call bearings probability = 2%, and frequency reserve factors 4.	10
b.	Explain the following : i) Cellular systems ii) Co-channel interference ratio with an example.	10

UNIT - II

3 a.	What are GSM frequency bands? List the objectives of GSM PLMN.	12
b.	What is dynamic power control? Explain.	8
4 a.	What type of interface is used between MS and BTS? What are the logical channels supported? Explain.	10
b.	How DTX (Discontinuous Transmission) helps to increase spectral efficiency, reduces power consumption and RF interface? Explain.	10

UNIT - III

5 a.	Which are the allowed logical channel combinations that can share same physical channel in GSM system?	6
b.	How data encryption is done in GSM? Explain with the help of a diagram.	8
c.	List six important capabilities of GSM bearer services.	6
6 a.	Explain mobile identification procedure with the help of a neat diagram.	10
b.	How call release procedure is initiated in mobile systems? Explain with the help of suitable diagrams.	10

UNIT - IV

7 a.	What is SMS? With a neat block diagram, explain point to point service type of SMS.	10
b.	Which are the four mechanisms through which GSM system privacy and security is achieved?	5
c.	Briefly explain encryption algorithms (A5).	5
8 a.	Write GPRS network architecture. Briefly explain.	6
b.	Which are the layers supported by protocol stack for SMS? Explain with suitable diagram.	8
c.	What is token based authentication? Explain.	6

UNIT - V

9 a.	Which are the approaches that are used to develop mobility model? Briefly explain.	6
b.	Explain the role of EML and NEL resource management layers briefly.	8
c.	Discuss the optional user-plane data services defined the DECT.	6
10 a.	Develop an equation for maximum allowable path loss which can determine coverage area of a system.	8
b.	What is fault management in TMN management services? Give the details.	6
c.	Write DECT reference architecture diagram and briefly explain.	6

✳ ✳ ✳