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

(An Autonomous Institution affiliated to VTU, Belgaum)

Seventh Semester, B.E. - Electronics and Communication Engineering

Semester End Examination; Dec - 2016/Jan - 2017

GSM Communication and Networks

Time: 3 hrs

Max. Marks: 100

- Note:* i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.
ii) Assume suitably any missing data.

UNIT - I

- 1 a. Compare three multiple access methods-FDAM, TDMA and CDMA and mention the advantages of FDMA and TDMA. 8
- b. In GSM digital cellular system, the one-way bandwidth is 15 MHz and channel spacing is 300 kHz. Eight users share each channel and 3 channels per cell are reserved for control channels. Calculate spectral efficiency.
- Assume:
- i) Omni directional antennas with each cell having an area of 8 km^2 12
- ii) Total coverage area is 4000 km^2
- iii) Avg. Nos. of calls during busy hour = 1.5
- iv) Avg. holding time of a call = 90 sec
- v) Call blocking probability = 2%
- vi) Frequency Re-use factor = 4
- 2 a. Explain how cell sectoring (3 sectors and 6 sectors) will reduce the interference in 7-cell reuse pattern. Provide necessary mathematical equations and appropriate sketches. 10
- b. Explain with mathematical equations and neat sketches, cellular concept with special reference to N, D/R Ratio [explain for N = 3, 7, 12]. 10

UNIT - II

- 3 a. Mention the objectives of a GSM PLMN and explain the services of the same. 8
- b. Explain the functional Model of North-American PCS-1900. 8
- c. List the various information carried by a SIM. 4
4. Explain the following Radio Link features of GSM, 20
- i) Dynamic power control ii) DTX.

UNIT - III

- 5 a. With a neat diagram, describe GSM Logical channels. 12
- b. Explain Mobile Identification process. 8

- 6 a. Describe the various supplementary services provided by GSM PLMN. 10
- b. With the help of flow diagram, explain mobile-terminated call. 10

UNIT - IV

- 7 a. Explain GSM-GPRS network architecture and give its protocol stack. 10
- b. Discuss protocol stack for Fax services. 10
- 8 a. Explain Token-based registration in GSM. 10
- b. Briefly explain the areas in which privacy is required for a PCS personal terminal. 10

UNIT - V

- 9 a. List the four parameters that are considered while designing a wireless system and explain them briefly. 8
- b. Which are the approaches that are used to develop mobility model? Briefly explain. 6
- c. Explain the role of EML and NEL, resource management layers briefly. 6
- 10 a. Explain 5-TMN Layers in M. 3010 in detail. 10
- b. With a neat diagram, explain NM architecture and interfaces. 10

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