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

(An Autonomous Institution affiliated to VTU, Belagavi)

**Eighth Semester, B.E. - Electronics and Communication Engineering**

**Semester End Examination; May / June - 2019**

**Advanced Wireless Technologies**

Time: 3 hrs

Max. Marks: 100

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

## UNIT - I

- 1 a. Explain the internal architecture of the core network of UMTS and GSM, with the help of a neat diagram. 12
- b. Discuss the need for LTE with respect to mobile data, system capacity and VOIP. 8
- 2 a. With the help of neat diagram, explain the internal architecture of user equipment. List some of the capabilities of the user equipment. 8
- b. Discuss the protocol model, signaling protocol and air-interface protocols as a part of communication protocols of UMTS / GSM. 12

## UNIT - II

- 3 a. With the help of relevant diagram, explain single carrier transmitter, FDMA and Multi-carrier principle. 12
- b. Explain the key elements included in the targets setting of LTE feasibility study work. 8
- 4 a. Explain the transmission and reception of OFDMA with the neat block diagrams. 8
- b. Explain all the LTE common transport layer channels involved in communication and their mapping with physical layer channels. 12

## UNIT - III

- 5 a. Discuss the important prerequisites for any future generation wireless technologies. 12
- b. Explain the 5G standardization activities under ITU, 3GPP and IEEE. 8
- 6 a. What do you mean Extreme mobile Broadband? Explain the feature of Extreme mobile broadband. 12
- b. Discuss the overview of 5G technology with respect to all the three generic 5G services. 8

## UNIT - IV

- 7 a. Explain the NFV and SDN. Discuss how NFV and SDN are applied in order to improve the needed flexibility in future wireless connection networks. 12
- b. Discuss how the functionality in 5G distributed with local radio access point and centralized processor to improve the flexibility. Represent the same with suitable flow diagram. 8
- 8 a. Write a note on spectrum usage and sharing scenarios of 5G technology. 8
- b. Explain the importance of bandwidth requirements for successful implementation of 5G. 12

## UNIT - V

- 9 a. Describe the fundamentals of Machine-Type Communication (MTC) and Explain data and controls for short packets. 8
- b. Write a note of Massive MTC. 12
- 10 a. Discuss all the research challenges of Device-to-Device 5G technology. 12
- b. Write a note on multi-hop D-2-D Communications for proximity and emergency. 8