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Total Number of Pages : 02

M.TECH

AR-19

M.TECH 1<sup>ST</sup> SEMESTER EXAMINATIONS NOV/DEC 2019

ECE, MPCEC1020

WIRELESS AND MOBILE COMMUNICATIONS

Time: 3 Hours

Max Marks : 70

The figures in the right hand margin indicate marks.

**PART-A**

**(10 X 2=20 MARKS)**

1. Answer the following questions.

- a) What do you mean by Frequency Reuse? [2×10]
- b) What is the need of handoff in mobile communication? Explain the mobile assisted handoff strategy.
- c) Write the advantages and disadvantages of FDMA over TDMA.
- d) Prove  $D = \sqrt{3NR}$ ?
- e) What the technology 5G uses?
- f) Define Reflection, Diffraction and Scattering?
- g) What do you mean by PN sequence? What is the role of it in CDMA?
- h) Differentiate between Fast Fading and Slow Fading?
- i) What is the role of an equalizer in a receiver of a wireless communication system?
- j) What is meant by spread spectrum multiple access?

**PART-B**

**(5 X 10=50 MARKS)**

Answer any five questions from the following.

Q2.

- a) What is cell splitting? Explain the 1:4 cell splitting technique. How does cell splitting improve the system capacity?
- b) What do you mean by Handoff? Explain the types of handoff with suitable diagram.

Q3.

- a) Explain about 2.75 standards & HSCSD.
- b) What are the different types of diversity techniques generally used? Describe the basic principle of each type.

Q4.

- a) What's a Rake receiver? Explain operation and principle of M-branch RAKE receiver.
- b) Discuss in detail about large scale and small scale multipath propagation models.



Q5.

- a) Explain PN Sequence generator with suitable diagram. Calculate the PN code if the initial value of the LSR is 101.
- b) If a GSM system uses a frame structure where each frame consists of 8 time slots, and each time slot contains 156.25 bits, and data is transmitted at 270.833 kbps in the channel, find (i) the time duration of a bit (ii) the time duration of a slot (iii) the time duration of a frame (iv) How long must a user occupying a single time slot wait between two successive transmissions?

Q6.

- a) Explain the function of Direct Sequence Spread Spectrum Systems?
- b) Explain about the CDMA. How it is different from CDMA 2000?

Q7.

- a) Consider GSM which is a TDM/FDD system that uses the total bandwidth of 25MHz and it is divided into the radio channel having 200kHz. If 8 users or speech channels are supported on a single radio channel and assume there is no guard band then calculate the no. of simultaneous users that can be accommodated in GSM.
- b) Explain about the different parameters of Multipath channels.

Q8.

- a) Explain the comparison between FDMA, TDMA and CDMA system.
- b) Explain the least mean square algorithm for adaptive equalization.

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