



(Following Paper ID and Roll No. to be filled in your Answer Book)

**PAPER ID : 131801**

Roll No.

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### B. Tech.

#### (SEM. VIII) THEORY EXAMINATION, 2014-15 WIRELESS & MOBILE COMMUNICATION

Time : 3 Hours]

[Total Marks : 100

Note : Attempt all questions.

1 Attempt any four parts : 5×4=20

- (a) Explain the term Evolution of mobile radio communication fundamentals.
- (b) A transmitter has a power output of 150 watt at a carrier frequency of 32.5 MHz. It is connected to an antenna with gain of 12 dBi. The receiving antenna is 10 km away and has gain of 5 dBi. Calculate the power delivered to the receiver, assuming free space propagation. Assume also that there are no losses or mismatches in the system.
- (c) Define the Brewster angle. Calculate the Brewster angle for a sine wave imping on the ground having a permittivity of  $\epsilon_r = 4$ .
- (d) Explain the term multipath measurement using relevant diagram.

- (e) Explain the outdoor models given below :
- (i) Durkin's Model
  - (ii) Okumura Model.

2 Attempt any four parts : 5×4=20

- (a) Draw the block diagram of survey of equalization and explain it.
- (b) Derive the impulse response model of multipath channel.
- (c) What is the basic mechanism of vocoder and explain any two types of vocoders.
- (d) Explain the different type of equalization techniques used in wireless communication with support of mathematics and block diagram.
- (e) Explain the different type of diversity techniques used in wireless communication system.

3 Attempt any two parts : 10×2=20

- (a) What are the different methods used for improving coverage and capacity in cellular system ? Describe all the method in detail with support of figures.
- (b) Define frequency reuse concept. And explain the different type of channel assignment strategies and hand-off strategies in communication system.

- (c) Given a cellular system with a total bandwidth of 30 MHz which uses two 25 kHz simplex channels to provide full duplex voice channels and control channels. Assuming that system uses a nine cell reuse pattern and 1 MHz of the total bandwidth is allocated for control channel :

- (i) Calculate the total available channel
- (ii) Determine the number of control channels
- (iii) Determine the number of voice channels per cells.
- (iv) Discuss the strategies for distribution of control and voice channels in each cell.

4 Attempt any two parts of the 10×2=20 following :

- (a) Describe the Forward CDMA channel and reverse CDMA channel using proper block diagram.
- (b) Explain the GSM architecture and frame structure in mobile radio communication using system in detail.
- (c) A FDD cellular communication system uses a total of 945 radio channels available for handling traffic. The total area of entire system is 2450 sqkm with the 7 sqkm as the area of a cell :
  - (i) Calculate the system capacity if the cluster size is 7.
  - (ii) Calculate the system capacity if the cluster size is 4.

- 5 Attempt any two parts : **10×2=20**
- (a) Why Next Generation Networks are important? Explain the Next Generation Network in detail.
  - (b) Explain Mobile Adhoc Network in wireless communication and discuss any two applications.
  - (c) Write the short note on following :
    - (i) Wireless standard IMT 2000
    - (ii) RAKE receiver.
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