Registration No: | | | | | | | | | | |

Total Number of Pages: 2 **M.TECH**
P2ECCC14

2nd Semester Regular Examination 2016-17
Wireless & Mobile Communication

BRANCH: COMMUNICATION ENGG, COMMUNICATION SYSTEMS, ELECTRONIC & COMM. ENGG, ELECTRONIC AND TELECOMMUNICATION ENGG, SIGNAL PROCESSING AND COMMUNICATION, SIGNAL PROCESSING AND ENGG, VLSI & EMBEDDED SYSTEMS, VLSI & EMBEDDED SYSTEMS DESIGN, VLSI DESIGN & EMBEDDED SYSTEMS, WIRELESS COMMUNICATION TECH.

Time: 3 Hours

Max Marks: 100

Q.CODE: Z983

Answer Question No.1 which is compulsory and any FOUR from the rest.
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: ***Short answer type*** **(2 x 10)**

- **a)** What do you mean by "Frequency Reuse"?
- **b)** Differentiate Frequency Selective Fading and Fast Fading?
- **c)** Why "Handoff" is used? What are its types?
- **d)** Define Mobile Ad-hoc Networks?
- **e)** What is Scattering of radio signal?
- **f)** Define Multicarrier Modulation?
- **g)** Write the features of GSM and GPRS?
- **h)** What is Rake Receiver? Why is it used?
- **i)** If a total of 33MHz of BW is allocated to a particular FDD cellular telephone system which uses two 25KHz simplex channels to provide full duplex voice & control channels. Compute the no. of channels available per cell if a system uses (i) 4-cell reuse (ii) 7-cell reuse (iii) 12-cell reuse.
- **j)** What is co-channel reuse ratio?

Q2 **a)** Discuss in detail about large scale and small scale multipath propagation models. **(10)**

b) Explain the free space propagation model and path loss model in detail. Also derive the equation for received power. **(10)**

Q3 **a)** Explain the main features, types and applications of spread spectrum communication. **(10)**

b) Find the median path loss using Okumura's model for d=50km, h_{te}=100m, h_{re}=10m in a suburban environment. If the base station transmitter radiates an EIRP of 1kW at a carrier frequency of 900MHz, Find the power at the receiver. Assume a unity gain receiving antenna, A_{mu}(900 MHz,50km)=43dB, $G_{(AREA)}$=9dB. **(10)**

Q4 **a)** (i) What is Okumura model? Mention its major advantages and disadvantages. **(5)**

(ii) If a Tx produces 50W of power, express the transmit power in units of dBm and dBW. If 50W is applied to a unity gain antenna with a 900 MHz carrier frequency. Find the received power in dBm at a free space distance of 100m from the antenna. What is P_r (10km)? Assume unity gain for the Rx antenna. **(5)**

b) Explain the different types of space diversity reception methods in detail. **(10)**

Q5 **a)** Explain in detail the methods to improve coverage and capacity in cellular systems. **(10)**

b) Compare FDMA, TDMA and CDMA. **(10)**

Q6 **a)** (i) Explain fading effects due to Doppler spread? **(5)**

(ii) Distinguish Pure ALOHA and Slotted ALOHA. **(5)**

b) Discuss the different channel allocation schemes. **(10)**

Q7 **a)** Explain Time hopping spread spectrum. **(10)**

b) **Write short notes on ANY two**. **(10)**

(i) Bluetooth

(ii) Wireless Local Loop

(iii) WiMax

(iv) Equalization Techniques