

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), April-May 2018

B. Tech. in Electronics & Communication Engineering, Semester VI

Roll No.....

ECE605:WIRELESS COMMUNICATION

Time: 3.0 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
 2. Assume suitable data wherever required and mention it clearly.
 3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
 4. Use of Non-Programmable calculator is allowed.
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Q.1 Objective type questions (10 questions @ 1 mark) 10

- i. Busy hour traffic is the
 - a) Maximum average simultaneous traffic.
 - b) Traffic during peak hour.
 - c) Traffic when all subscribers are engaged.
 - d) The duration of maximum calls.
- ii. A geostationary satellite completes one orbit in
 - a) 1 hour
 - b) 6 hours
 - c) 24 hours
 - d) (d) 7 days
- iii. Write the IEEE standard for Bluetooth.
- iv. Write the IEEE standard for WiMAX.
- v. The original IEEE 802.11, uses _____.
 - a) FHSS
 - b) DSSS
 - c) OFDM
 - d) either (a) or (b)
- vi. Why do we use binary chips in CDMA Systems?
- vii. The downlink frequency of GSM is_____.
- viii. What is mean for ISM band?
- ix. Write the full form for LTE.

x. Write the full form of PACS.

- Q.2 Each Question is of 2.5 marks 10
- Explain Brewster angle in detail.
 - What are the different frequency bands used for Wi-Fi communication?
 - A vehicle travels through a cellular system at 100 kmph. How often will Handoffs occur if the cell radius is 10 km?
 - What do you understand with ALOHA?
- Q.3A Explain why Propagation Path Loss is one of the major parameters of interest in analysis of radio wave propagation for mobile communication? 05
- Q.3B What do understand with modulation? What is the need of modulation? Explain the parameters which can be used for modulation. 05
- Q.4A A normal GSM has 3 start bits, 3 stop bits, 26 training bits for allowing adaptive equalization, 8.25 guard bits and 2 bursts of 58 bits of encrypted data which is transmitted at 270.833 kbps in the channel. Find 05
- Number of overhead bits per frame
 - Total number of bits per frame
 - Frame rate
 - Time duration of a slot
 - Frame efficiency
- Q.4B Suppose you are given a channel with an SNR of 25 dB and a bandwidth of 5 MHz. 05
- What is the capacity of this channel?
 - If the noise power Noise 10^{-9} W/Hz, what received signal power is needed to achieve the SNR of 25 dB?
 - What is the received signal power in dB?
- Q.5A Explain the frequency hopping spread spectrum system with single channel modulation. 05
- Q.5B Why is the frequency reuse distance never violated, when allotting frequency channels to various cells? What are the consequences of violating this distance? 05
- Q.6A Explain BPSK receiver with carrier recovery circuits. 05
- Q.6B Explain QPSK with suitable diagrams & equations. 05

Q.7A Explain the 2x2 MIMO Systems in detail. 05

Q.7B Justify the OFDM is a spectrally efficient technique compared to FDM. 05

OR

Q.7B Explain the forward CDMA channel modulation process using suitable block diagram. 05

Q.8A Explain Bluetooth protocol stack using suitable diagram. 05

Q.8B Explain CSMA protocols in detail. 05

OR

Q.8B Determine the maximum throughput that can be achieved using ALOHA and Slotted ALOHA protocols. 05

Q.9 Explain GSM architecture in detail with suitable diagrams. 10

OR

Q.9 Write a short note on: 5+5

- a) Hyper-LANs
- b) PACS

Q.10 Consider a single branch Rayleigh fading signal has 20% chance of being 6 dB below some mean SNR threshold. 10

- a) Determine the mean of the Rayleigh fading signal as referenced to the threshold. (4)
- b) Find the likelihood that a two branch selection diversity receiver will be 6 dB below the mean SNR threshold.(3)
- c) Find the likelihood that a three branch selection diversity receiver will be 6 dB below the mean SNR threshold.(3)

OR

Q.10 Explain IEEE 802.11 MAC (Medium access control) frame format in detail. 10