

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular), Jan-July 2015

M. Tech. in Electronics & Communication Engineering, Semester II



Roll No.....

MTEC202: WIRELESS & MOBILE
COMMUNICATION

Time: 3.0 hours

Max. Marks: 100

Instructions to students:

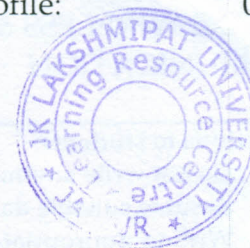
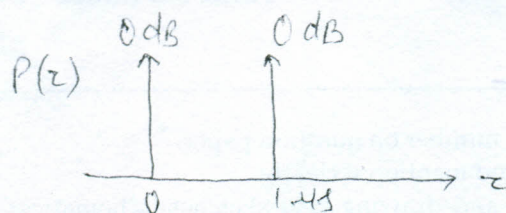
1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
4. Use of Non-Programmable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

Q.1	Objective type questions (10 questions @ 1 mark)	10
i.	A geostationary satellite completes one orbit in (a) 1 hour (b) 6 hours (c) 24 hours (d) 7 days	
ii.	For GSM security _____ key is dynamic.	
iii.	What is Nyquist Criteria for signaling?	
iv.	Why is the use of binary chips in CDMA Systems?	
v.	Write the full form of OQPSK.	
vi.	What is 802.11 IEEE standard?	
vii.	The basic GSM is based on _____ traffic channels.	
viii.	Write the full form of PACS.	
ix.	What is the maximum data rate at which a user can transmit data on a DECT system?	
x.	What is Abis interface in GSM?	
Q.2	Each Question is of 2.5 marks	10
i.	Explain Carson's rule to calculate the FM bandwidth.	
ii.	Explain the frame structure of PACS.	
iii.	Justify that "MIMO- OFDM is better than FDMA".	
iv.	If a US AMPS cellular operator is allotted 12.5 MHz for each simplex band, and if B_t is 12.5 MHz, B_{guard} is 10 KHz and B_c is 30KHz, find the number of channels available in an FDMA system.	
Q.3A	Explain the fast and slow small scale fading with suitable equations.	05
Q.3B	What are the different Outdoor Propagation Models for RF Communications? Explain any one of them in detail.	05
Q.4A	Explain QPSK with suitable diagrams & equations. Also give the spectrum & bandwidth of QPSK signals.	05

Q.4B Explain the differences between flat fading and frequency selective fading. 05

Q.5A Compute the RMS delay spread for the following power delay profile: 05

(a)



(b) If BPSK modulation is used, what is the maximum bit rate that can be sent through the channel without needing an equalizer?

Q.5B Explain DECT functional block diagram in detail. 05

Q.6A For a 8 bit uniform quantizer that spans the range (-1V to 1V), determine the step size of the quantizer. Computer the SNR due to quantization if the signal is a sinusoid that spans the entire range of the Quantizer. 05

Q.6B In an Omnidirectional (single cell, single sector) CDMA cellular system, $E_b/N_0 = 20$ dB is required for each user. If 100 users, each with a baseband data rate of 13 kbps, are to be accommodated, determine the minimum channel bit rate of the spread spectrum chip sequence. 05

OR

Q.6B What are the different CSMA protocols? 05

Q.7 Why do we use Diversity techniques at communication receiver? What are different space diversity techniques? Explain any two of them. 10

OR

Q.7 Explain the Equalizer with suitable diagram and equations. 10

Q.8 A 64 kbps voice frame is to be modulated by OFDM scheme. The duration of OFDM symbol is 1000 micro second. Total of 32 subcarriers are to be assigned to this frame. Find out 10

- The null to null subchannel bandwidth with assuming square signal.
- The total bandwidth occupied.
- The number of bits in OFDM frame.

OR

Q.8 What is Raised Cosine Roll-off Filter? Why do we use it? Explain the Magnitude transfer function and Impulse response of it using suitable equations and diagrams. 10

Q.9 Explain Bluetooth Network structure in detail. 10

OR

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

Q.10 What are the different methods used for security enhancement in 802.11? 10