International Islamic University Chittagong (IIUC)

Department of Electronic and Telecommunication Engineering

Final Examination

Program: **B.sc (Engg.)**
Course Code:**ETE–3643**
Total Marks: **50**

Semester: **AUTUMN 2022**
Course Title: **Mobile and Wireless Communications**
Time: **2 Hours 30 Minutes**

(i) Answer all the questions. The figures in the right-hand margin indicate full marks. **(ii) Course Outcomes (COs) and Bloom's Levels are mentioned in additional Columns.**	
Course Outcomes (COs) of the Questions	
CLO: 1	Understanding of basic wireless and cellular communication techniques.
CLO: 2	**Ability to solve** different propagation and path loss model related problems. Comprehend the operation of GSM and other types of Cellular Mobile Communication system, Diversity techniques, Rake Receiver etc.

Bloom's Levels of the Questions						
Letter Symbols	**R**	**U**	**Ap**	**An**	**E**	**C**
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

PART A

Q1.	a)	Explain the three radio propagation mechanisms with figures.	CLO1	Ap/E	5
	b)	Explain the Okumura Model and the Hata Model.	CLO2	E	5
Q2.	a)	How would you distinguish between Large-scale fading and Small-scale fading?	CLO1	An/E	5
	b)	Write about the concept of coherence bandwidth and coherence time.	CLO2	E	5
		OR			
Q2.	a)	Write about the two main channel design issues. Write about the Link budget design using path loss models.	CLO1	An/E	3+2
	b)	Write down the names of the statistical models for multipath fading channels. Explain the Gilbert-Elliot model.	CLO2	E	5

PART B

Q3.	a)	Show the comparison of the various algorithms for adaptive equalization.	CLO1	Un/E	5
	b)	Prove that "The SNR output of the diversity combiner in case of Maximal Ratio Combining is simply the sum of the SNRs in each branch."	CLO2	E	5
Q4.	a)	Write down the Features of TDMA.	CLO1	Un/E	5
	b)	Explain Frequency Hopping Multiple Access (FHMA)? What is	CLO2	E	3+2

		Fast hopping and slow hopping?			
Q5.	a)	Write about Narrowband Systems and Wideband systems.	CLO1	Un/E	5
	b)	Design a rake receiver for radio receiver and properly explain its working procedure..	CLO2	E	5
		OR			
Q5.	a)	Write short notes on: i) International Mobile Station Equipment Identity (IMEI) ii) International Mobile Subscriber Identity (IMSI) iii) Mobile Subscriber ISDN Number (MSISDN) iv) Mobile Station Roaming Number (MSRN) v) The Base Transceiver Station (BTS)	CLO1	Un/E	5
	b)	Explain the Network Switching Subsystem (NSS) of the GSM.	CLO2	E	5