Moda

International Islamic University Chittagong (IIUC)

Department of Computer and Communication Engineering

Final Examination

Program: **B.sc (Engg.)**
Course Code: **CCE–3607**
Total Marks: **50**

Semester: **Spring 2022**
Course Title: **Cellular Mobile Communication**
Time: **2 Hours 30 Minutes**

(i) Figures in the right margin indicate full marks. Answer should be relevant and clearly written. All the parts of a question must be answered serially.

(ii) Course Learning Outcomes (CLOs) and Bloom's Levels are mentioned in additional Columns.

Course Learning Outcomes (CLOs) of the Questions

CLO1	Understanding of basic wireless and cellular communication techniques.
CLO2	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, Multiple Input Multiple Output (MIMO) technique, underwater communication system etc.

Bloom's Levels of the Questions

Letter Symbols	**R**	**U**	**Ap**	**An**	**E**	**C**
Meaning	Remember	Understand	Apply	Analyze	Evaluate	Create

Part A

Answer <u>Two</u> of the following Questions.

Q1.	**a)**	How can you describe the advantages and disadvantages of the two-ray ground reflection model in the analysis of path loss.	**CLO1**	**U**	**3**
	b)	In the following cases, tell whether the two-ray model could be applied, and explain why or why not: I. **h_t=45m, h_r=3m, d=60m** II. **h_t=30m, h_r=1.5m, d=1500m**	**CLO2**	**Ap**	**4**
	c)	How would you generalise Phase 1, Phase 2 & Phase 2+ with their feature?	**CLO2**	**U**	**3**
Q2.	**a)**	Can you illustrate some of the most common problems while transmitting a radio signal?	**CLO1**	**U**	**5**
	b)	Construct the Ericsson GSM network system model diagram and categorise each group with several elements of actual work.	**CLO2**	**An**	**5**

OR

Q2.	**a)**	How would you distinguish between Large-scale fading and Small-scale fading?	**CLO1**	**U**	**5**
	b)	Discuss various physical factors that influencing fading in mobile radio channel.	**CLO2**	**An**	**5**

Part B

Answer <u>Three</u> of the following Questions.

Q3.	**a)**	What criteria would you use to design of telecommunication system also describe each criterion in your own words.	**CLO1**	**An**	**6**
	b)	If 1500 subscribers originate 75 Erlangs in busy hour with average holding time of 3 min 48 sec. What is the busy hour calling rate. If these subscribers lose 40 calls in the busy hour, what is the grade of service?	**CLO2**	**Ap**	**4**

Q4.	**a)**	Can you write in your own words about: I. Calling Attempts & Rate II. Call Completion Rate III. Busy Hour Calling Rate IV. Busy Hour Call Attempts V. Traffic Intensity VI. Grade of Service	**CLO1**	**U**	**4**
	b)	A Subscriber makes three phone calls of duration **15 min**, **8 min** and **6 min**, in one hour. Calculate the subscriber's traffic in **CCS, CS** and **CM**.	**CLO2**	**Ap**	**4**
	c)	Over a **20**-minute observation interval, **40** subscribers initiate calls. Total duration of calls is **4800** seconds. Calculate the load offered to the network by the subscribers and the average subscriber traffic.	**CLO2**	**Ap**	**2**
Q5.	**a)**	Explain the different elements of a switching system with their logical interconnections.	**CLO1**	**U**	**5**
	b)	Summarize about Line **Finder** & **Alloter**.	**CLO2**	**R**	**5**
		OR			
Q5.	**a)**	Illustrate the underwater acoustic communication protocol stack.	**CLO1**	**U**	**5**
	b)	Why is diversity technique treated as a powerful tool in combating the effects caused by hostile radio impairments?.	**CLO2**	**R**	**5**