

M.Tech. Examination-2022  
 Electronics and Communication Engineering  
 (Odd Semester Regular and Supplementary)  
 Mobile Networks and Computing (ECEPGPE13)

Full Marks: 80

Time: 3.00 Hrs

Answer any FIVE questions(Each question carry equal marks)

Answer all parts of a question in same place.

Figures on the right hand side margin indicate full marks.

Symbols have their usual meaning

	<b>Marks</b>
1. (a) What are the sources of interference in cellular mobile communication system? Mention them.	2
(b) How does the co-channel interference reduced in cellular mobile system design? Discuss.	3
(c) Prove that Reuse distance $D=R*\sqrt{3N}$ , where R is radius of the Cell	5
(d) If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses (a) 4-cell reuse, (b) 7-cell reuse (c) 12-cell reuse. If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell for each of the three systems.	6
2. (a) Explain the advantages and disadvantages of the 2-ray ground reflection model in the analysis of path loss.	4
(b) In the following cases, tell whether the 2-ray model could be applied, and explain why or why not: $h_t= 35 \text{ m}, h_r= 3 \text{ m } d= 250 \text{ m}$ $h_t= 30 \text{ m}, h_r= 1.5 \text{ m } d= 450 \text{ m}$	6
(c) What insight does the 2-ray model provide about large-scale path loss that was disregarded when cellular systems used very large cells?	6
3. (a) Discuss the Okmura model for path loss in outdoor propagation. Compare with Hata model	6+4
(b) Find the median path loss using Okumura's model for $d = 50 \text{ km}, h_{te}= 100 \text{ m}, h_{re} = 10 \text{ m}$ in a suburban environment. If the base station transmitter radiates an EIRP of 1 kW at a carrier frequency of 900 MHz, find the power at the receiver (assume a unity gain receiving antenna).	6
4. (a) What is small scale fading? Discuss this.	4
(b) What is delay spread effect in wireless propagation?	6
(c) A vehicle receives a 910 MHz transmission while travelling at a constant	6

velocity for 15s. The average fade duration for a Rayleigh fading signal level 10 dB below the RMS level is 1ms. How far does the vehicle travel during 15 s time duration? Assume that the local mean remains constant during travel.

5. (a) With neat sketch briefly describe the functional architecture of GSM system. 6
- (b) Explain the TDMA-FDMA frame formats in GSM system. 4
- (c) Mention different types of channels used in GSM technology. 6
6. (a) What is Medium Access Control (MAC) in mobile computing? 4
- (b) What is near and far effect in mobile communication? Explain. 4
- (c) Explain the carrier sense multiple access technique for wireless communication. 4
- (d) What is DAMA technique? Explain. 4
7. **Write short notes on any two of the following.**
- (a) Handoff
- (b) UMTS
- (c) MANET

-End-

# Aliah University

M. Tech. III Semester Examination December -2022

Autumn (Odd) Semester Examination

Sub: Research Methodology &IPR

Code- EENPGPR02/ ECENPGPR02/ CENPGPR02/ CSENPGR02 / CSEPGPR02

Full Marks: 80

Duration: 3 hrs

## Section I

**Attempt any 10 questions from the Section I. Each question carries 2 marks** 10×2 =20

1. The word “Research” is derived from which language and what does it mean?
2. When pure research is applied to a new situation after careful inquiry it is called ..... research.
3. Name any two of the sampling techniques comes under the category of probability sample.
4. Define sample in two or three sentences.
5. What is the full form of IPR?
6. In which of the data collection method we collect data face to face?
7. In which of the sampling techniques each item in the population has an equal chance of inclusion?
8. Write down the name of any two types of research mentioned in your syllabus.
9. What do you understand by Hypothesis?
10. Another name of Basic Research is .....
11. Write any two motivations in research.
12. What do you mean by copyrights?
13. Which acts are considered as unethical in research?

## Section II

**Attempt any 6 questions from the Section II. Each question carries 5 marks** 6×5 =30

1. What is Research? Explain the objectives of research.
2. What is Quantitative and Qualitative Research? Write down the differences between them.
3. What do you mean by a Research Problem and how will you identify the Research Problem?
4. What is Sample in Research? Write down the differences between non-probability and probability Sampling?

5. What is Hypothesis Testing? Briefly explain various steps involved in testing hypothesis.

**P.T.O**

6. What do you understand by Reference and Bibliography in research? What are the main differences between them?

7. Explain the necessity of defining a research problem.

8. Discuss various sources involved in selecting a research problem.

9. What is Ethics of Research? Discuss the principles of Research Ethics.

### **Section III**

**Attempt any 3 questions from the Section III. Each question carries 10 marks 3×10=30**

1. Discuss in details the research process and its various stages with suitable examples.

2. What are the criteria of a good research? Make comparisons between Research Methods and Research Methodology.

3. What is Research Report? Explain various steps involved in preparing a Research Report.

4. Write short notes on:

a) Patents

b) Copyrights

5. What is Scientific Misconduct in Research? Discuss various forms of Scientific Misconduct. Write down Societal effect of Scientific Misconduct.

6. Write down in detail various Sampling methods involved in collection of data.