Hall Ticket No | | | | | | | | | | | Question Paper Code: AEC520

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER - II

B.Tech VI Semester End Examinations (Regular), May – 2020

Regulations: R16

CELLULAR AND MOBILE COMMUNICATION

(ECE)

Time: 3hours **Max. Marks: 70**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

1. a) Explain analog and digital Cellular systems? **[7M]**

   b) Define co-channel interference and derive the co-channel interference reduction factor. **[7M]**

2. a) What is the value of co-channel interference reduction factor in a 7-cell reuse Pattern? **[7M]**

   b) Explain significance of Omni-directional antenna system **[7M]**

UNIT – II

3. a) Define interference. Types of co-channel interferences and explain each with neat diagrams? **[7M]**

   b) Illustrate the phase difference between direct and reflected paths. **[7M]**

4. a) Illustrate the constant standard deviation in mobile radio communication **[7M]**

   b) Define interference. Types of co-channel interferences and explain each with neat diagrams. **[7M]**

UNIT – III

5. a) Illustrate the sum and difference patterns and their synthesis? **[7M]**

   b) What is channel assignment? Explain how can form the numbering and grouping in cell site. **[7M]**

6. a) What is Handoff? Explain types of handoffs **[7M]**

   b) Illustrate about dropped call rates and their evaluation. **[7M]**

UNIT – IV

7. a) What is GSM? Explain GSM architecture. **[7M]**

   b) What is IS95? Explain IS95 with neat block diagram. **[7M]**

8. a) Explain about WLL and DECT? **[7M]**

   b) Explain about GSM channels. Describe each with one example. **[7M]**

UNIT – V

9. a) What is the relation to AIN for mobile communication? **[7M]**

   b) Explain with one example about advanced intelligent network.. **[7M]**

10. a) What is SS7 network? Explain about SS7 network and ISDN for AIN. **[7M]**

    b) Explain wireless information superhighway with neat block diagram. **[7M]**

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COURSE OBJECTIVES:

The course should enable the students to:

The course should enable the students to:	
I	Understand fundamental treatment of wireless communications and the Cellular Concept- System Design, Fundamental concepts like frequency reuse, Radio Wave Propagation Basic Propagation Mechanisms and Diffraction Models
II	Understand the concept of frequency reuse and be able to apply it in the design of mobile cellular system.
III	Understand the various modulation schemes and multiple access techniques that are used in wireless communications..
IV	Remember the analytical perspective on the design and analysis of the traditional and emerging wireless networks and discuss the nature of and solution methods to the fundamental problems in wireless networking.
V	Understand the concept of frequency reuse and be able to apply it in the design of mobile cellular system.

COURSE OUTCOMES (COs):

CO 1	Demonstrate cellular mobile system design concepts in wireless mobile communication networks.
CO 2	Design of Antenna system, Antenna parameters and their effects, diversity receiver, non co-channel interference-different.
CO 3	Understand the concepts of Handoff, dropped calls and cell splitting, Intersystem handoff
CO 4	Imbibe knowledge about Wireless Systems And Standards GSM channels, multiplex access scheme, TDMA, CDMA
CO 5	Intelligent Network For Wireless Communications SS7 network and ISDN for AIN, AIN for mobile communication.

COURSE LEARNING OUTCOMES (CLOs):

CLO Code	CLO's	At the end of the course, the student will have the ability to
AEC520.01	CLO1	Identify the limitations of conventional Mobile Telephone Systems; understand the basic cellular mobile system.
AEC520.02	CLO2	Remember Uniqueness of mobile radio environment- fading- Factors Time dispersion parameters, Coherence bandwidth, Doppler spread and coherence time.
AEC520.03	CLO3	Understand the concept of frequency Reuse channels, Deduce the Co- channel interference reduction factor.
AEC520.04	CLO4	Analyze perspective on Fundamentals of Equalization and Mobile Radio Propagation Multipath Measurements.
AEC520.05	CLO5	Explain Co-channel interference with near end far end interference.
AEC520.06	CLO6	Understand Signal reflections in flat and hilly terrain, Effect of human made structures.
AEC520.07	CLO7	Remember concepts of cell coverage for signal and traffic.
AEC520.08	CLO8	Demonstrate wireless local area networks and their specifications in communication system.
AEC520.09	CLO9	Understand Signal reflections in flat and hilly terrain, Effect of human made structures.
AEC520.10	CLO10	Understand Cell Site and Mobile Antennas.
AEC520.11	CLO11	Understand Phase difference between direct and reflected path.

AEC520.12	CLO12	Understand the operation of the various wireless wide area networks such as GSM, IS-95, GPRS and SMS.
AEC520.13	CLO13	Understand the existing and emerging wireless standards in wireless wide area networks.
AEC520.14	CLO14	Demonstrate wireless local area networks and their specifications in communication system.
AEC520.15	CLO15	Understand the existing and emerging wireless standards in wireless wide area networks.
AEC520.16	CLO16	Understand the SS7 network and ISDN for AIN, AIN for mobile communication.
AEC520.17	CLO17	Remember the Intelligent cell concept, advanced intelligent network.

MAPPING OF SEMESTER END EXAMINATION TO COURSE LEARNING OUTCOMES:

SEE Question Number		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
1	a	AEC520.01	Identify the limitations of conventional Mobile Telephone Systems; understand the basic cellular mobile system	CO 1	Understand
	b	AEC520.02	Remember Uniqueness of mobile radio environment- fading- Factors Time dispersion parameters, Coherence bandwidth, Doppler spread and coherence time.	CO1	Understand
2	a	AEC520.03	Understand the concept of frequency Reuse channels, Deduce the Co- channel interference reduction factor	CO1	Analyse
	b	AEC520.04	Analyze perspective on Fundamentals of Equalization and Mobile Radio Propagation multipath Measurements.	CO1	Understand
3	a	AEC520.05	Explain Co-channel interference with near end far end interference.	C02	Understand
	b	AEC520.06	Understand Signal reflections in flat and hilly terrain, Effect of human made structures.	CO2	Remember
4	a	AEC520.07	Remember concepts of cell coverage for signal and traffic.	CO2	Understand
	b	AEC520.08	Demonstrate wireless local area networks and their specifications in communication system.	CO2	Understand
5	a	AEC520.09	Understand Signal reflections in flat and hilly terrain, Effect of human made structures.	C03	Understand
	b	AEC520.10	Understand Cell Site and Mobile Antennas.	CO3	Understand
6	a	AEC520.10	Understand Cell Site and Mobile Antennas	CO3	Remember
	b	AEC520.11	Understand Phase difference between direct and reflected path.	CO3	Analyze
7	a	AEC520.11	Understand Phase difference between direct and reflected path..	CO4	Understand
	b	AEC520.12	Understand the operation of the various wireless wide area networks such as GSM, IS-95, GPRS and SMS.	CO4	Understand
8	a	AEC520.13	Understand the existing and emerging wireless standards in wireless wide area networks.	CO4	Understand
	b	AEC520.14	Demonstrate wireless local area networks and their specifications in communication system.	CO4	Understand
9	a	AEC520.15	Understand the existing and emerging wireless standards in wireless wide area networks	CO5	Understand
	b	AEC520.16	Understand the SS7 network and ISDN for AIN, AIN for mobile communication	CO5	Understand

10	a	AEC520.15	Understand the existing and emerging wireless standards in wireless wide area networks.	CO5	Understand
	b	AEC520.17	Remember the Intelligent cell concept, advanced intelligent network.	CO5	Understand

Signature of Course Coordinator **HOD, ECE**