MID QUESTION BANK

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Course Name	:	C ELLULAR AND MOBILE COMMUNICATION
Course Code	:	58024
Class	:	IV- B.Tech
Branch	:	ECE
Year	:	2017 – 2018
Course Faculty	:	Dr.N.Srinivas, K.Kavitha

Course Objectives:

: Analyze the operation of cellular systems and hexagonal shaped cells.
: Design the desired C/I from a normal case in an Omni directional Antenna system
: Analyze different types of non-co-channel
interference.
: Apply the methods to reduce the interference by using Omni directional antennas, directional antennas
: distinguish different types of cell site antennas and mobile antennas.

OBJECTIVES:

UNIT -1

S.No:	QUESTION	Blooms Taxonomy Level	Course outcome
	SHORT ANSWER QUESTIONS		
1	Define fading effect?	Analyze	A
2	What is known as Rayleigh fading?	Knowledge	A
3	What are the main parts of mobile radio environment?	Understand	A
4	Give two advantages of cellular mobile systems over telephone systems?	Analysis	C
5	Write the equation to calculate offered load in mobile transmission?.	Knowledge	A
6	What are the functions of MTSO?	Knowledge	B
7	Define trunking efficiency?	Applying	B
8	How voice quality can be tested?	Understand	A
9	What is known as circuit merit?	Understand	A
10	What are the items required for service quality.	Analyze	C
11	Give two advantages of cellular mobile system over telephone system	Analyze	A
12	What is FCC	Analyze	A
13	How voice quality can be tested	Analyze	A
14	Define coherence bandwidth	Analyze	A
15	Define ignition noise	Analyze	A
16	What is meant by direct wave path	Understand	B
17	Define line of sight path and obstructive path	Analyze	B
18	What is the significance of hexagonal shaped cells	Analyze	A
19	Define delay spread	Analyze	C
20	What are two main parts of mobile radio environment	Analyze	A
21	Explain 1G cellular system	Analyze	C
22	Explain 2G cellular system	Analyze	A
23	Explain 3G cellular system	Analyze	A
24	Explain 4G cellular system	Analyze	B
25	Define co-channel interference	Analyze	B
26	What is meant by frequency reuse	Analyze	A
27	What are advantages of frequency reuse	Understand	A
28	Define cell splitting	Analyze	A
29	Define micro cells	Analyze	C
30	What is meant by macro cell	Analyze	B
	LONG ANSWER QUESTIONS		
1	Consider maximum number of calls in one hour in one cell is 3500 and an average calling time‘t’ is 1.76 minutes. Calculate the offered load in the cell	Analyze	A
2	Consider a metropolitan area of 1100 square km is to be covered by cells with cell radius of 2 km. Calculate the number of cells that would be needed assuming hexagonal cell shape	Understand	A
3	Explain the operation of cellular mobile system with block	Analyze	C

	diagram		
4	Explain amplifier noise and ignition noise in detail.	Analyze	A
5	What is the uniqueness of mobile radio environment, explain	Understand	B
6	Explain the significance of fading of fading in mobile environment.	Analyze	C
7	Discuss the limitations of conventional mobile telephone system	Analyze	B
8	Compare analog and digital cellular systems with at least 15 points each.	Understand	C
9	What is multi path effect; explain its effects in mobile propagation	Understand	A
10	Explain the call initialization, call progress and call termination process	Understand	B
11	Explain significance of Omni-directional antenna system.	apply	B
12	What is cell-splitting? Explain its types in detail	apply	A
13	Explain co-channel interference with first tier and second tier example	apply	A
14	Explain the concept of co-channel interference in detail	Creating	C
15	Explain the normal case of carrier to interference ratio with Omni-directional antenna	Creating	B
16	What is meant by co-channel interference reduction factor? Explain with all equations	understanding	A
17	Explain a) Concept of frequency channels and b) Co-channel interference.	remembering	A
18	Calculate the maximum data rate required for transmission if the signal to noise of the communication link is 20 dB and the RF bandwidth is 40 KHz.	Creating	C
19	Explain the concept of co-channel interference in detail.	Creating	C
20	Explain the 1G-AMPS and aay one 2G cellular system	Analyze	A

UNIT-2

S.No:	QUESTION	Blooms Taxonomy Level	Course outcome
	SHORT ANSWER QUESTIONS		
1	Define co-channel interference.	remembering	A
2	If the actual signal is e1 and interference is e2 what will be the received signal.	remembering	A
3	Comment on the lowering antenna height method in a valley	understanding	B
4	If co-channel interference reduction factor q is 6 what will be the cluster site?	understanding	B
5	Mention two advantages of omni-directional antenna.	apply	C
6	If co-channel interference reduction factor q is 5.2 and the cluster size is q what will be the carrier to interference ratio.	apply	C
7	What are the types of diversity?	understanding	B
8	Write short note on diversity	understanding	B
9	Define SINAD and WER.	remembering	A
10	Give two uses of parasitic elements.	remembering	A
11	What is ring combiner?	Understand	B
12	What is frequency-agile combiner?	Understand	A
13	What is channel combiner?	Knowledge	A
14	What are the methods to reduce adjacent channel interferences?	Knowledge	A
15	What are the effects of cell site antenna height analysis?	Understand	B
16	What is cross talk?	Creating	C
17	What is known as near end-far-end interference?	Understand	B
18	What is known as adjacent channel interference?	Remember	A
19	How receiver sensitivity is measured.	Remember	A
20	Give the two examples for non-co-channel interference	Understand	B
21	How many channels ring combiner can handle	Understand	A
22	SPEECH QUALITY CAN BE MEASURED BY	Understand	A
23	Technique used for reducing interference	Understand	B
24	If cluster size N=4 a better cell sectoring system will have	Understand	C
25	THE VALUE OF CO-CHANNEL interference ratio q is 5.2 for N=9 and if N=12 it will be	Knowledge	C
26	FOR NARROW BEAM APPLICATION WHICH CELLULAR PATTERN USE	Understand	A
27	How to reduced co-channel and long distance interferences	Knowledge	C
28	In flat ground or in valley interference can be effectively reduced by	Understand	B
29	The goal of frequency reuse technique in a cell	Knowledge	A
30	Why we use demultiplexer at cell site channel receiver	Understand	A
	LONG ANSWER QUESTIONS		

1	Explain briefly about cell site components.	Understand	B
2	Explain UHF TV interference	Understand	B
3	Explain the effects of coverage and interference by power decrease and decrease antenna height.	Knowledge	A
4	Explain the effects of coverage and interference by power decrease and decrease antenna height.	Analysis	C
5	Explain non-co-channel interference effects on coverage and interferences	Knowledge	A
6	Explain diversity receiver and SINAD measurements.	Understand	B
7	Explain the types of non-co-channel interferences in cellular system.	Knowledge	A
8	Give the two examples for non-co-channel interference.	Creating	C
9	What is known as adjacent channel interference?	Understand	B
10	What is known as near end-far-end interference?	Remember	A
11	Explain antenna system design and different test methods in detail.	remembering	A
12	Explain diversity receiver	remembering	A
13	Explain the types of non-co-channel interferences in cellular system.	apply	C
14	Explain 'diversity receiver' in detail?	apply	C
15	Explain a) Parasitic elements and b) Co-channel interferences in cellular system	understanding	B
16	Explain antenna system design methods in detail	Creating	C
17	Compare and explain co-channel and non-co-channel interferences in detail.	Analyze	C
18	What is co-channel interference? Explain its measurements.	Understand	B
19	Explain real time co-channel interference in detail	Analyze	C
20	Explain subjective versus objective test measurements and SINAD in detail.	Understand	B

	SHORT ANSWER QUESTIONS		
S. No.	**Question**	**Blooms Taxonomy Level**	**Course Outcomes**
1.	What are human made structures	Analyzing	a
2.	What are natural terrains	Analyzing	a
3.	Give two examples for natural terrains and human made structures	Analyzing	a
4.	Write a short notes on signal reflections in flat terrains	Analyzing	a
5.	Write a short notes on point –to-point model	Analyzing	a
6	Give any two effects of human made structures	Analyzing	b
7	What are the three main types of point –to-point model	Remember	b
8	Write the equation of effective antenna height gain.	Understand	a
9	Draw the diagram of human made structure to find propagation path loss curve	knowledge	b
10	Write a short notes on constant standard deviation along a path loss curve	understanding	b
11	Draw the graph of an 8db local mean spread	Analyzing	**a**
12	Draw a simple model for propagation over water	Analyzing	b
13	Give the general formula for mobile radio propagation	Analyzing	a
14	Write a short notes on foliage loss	Analyzing	a
15	Write a short notes on characteristic of foliage environment	Analyzing	a
16	What is the significance of a 1mi intercept under propagation in near in distance case?	Analyzing	b
17	what are near and long distance propagation ?	Analyzing	c
18	List the merits of point –to-point model	Analyzing	c
19	Write a short notes about signal reflections in hilly terrain	Analyzing	a
20	Compare a hilly and flat terrain with important points	understanding	b
21	What is the technique of space diversity antennas?	Analyzing	c
22	Mention the types of umbrella pattern antennas	Analyzing	b
23	What are the advantages of space diversity antennas?	understanding	a
24	What is the use of a two branch space diversity antenna?	Analyzing	a
25	Write a short notes on umbrella pattern antenna	Analyzing	a
26	Write a short notes on minimum separation of cell site antennas	Analyzing	a
27	Write a short notes on mobile antennas	Analyzing	b
28	What is the use of broad band umbrella pattern antenna?	Analyzing	a
29	What is the switch combined technique?	Analyzing	b

30	Write a short notes on interference reduction antenna	Analyzing	c

Unit 3

LONG ANSWER QUESTIONS			
1	Explain human made structures and their effects	Understand	B
2	Explain natural terrains structures and their effects	Understand	B
3	Explain signal reflections in flat terrain contours	Knowledge	A
4	Explain signal reflections in hilly terrain contours	Analysis	C
5	Explain point –to-point model with its equations	Knowledge	A
6	Explain about the direct paths in detail.	Understand	B
7	Explain about the reflected paths in detail	Knowledge	A
8	Explain constant deviation along a path loss curve in detail	Creating	C
9	Explain propagation of mobile signal over water	Understand	B
10	Explain propagation of mobile signal over flat open area	Remember	A
11	Derive the general formula used for signal propagation over water	remembering	A
12	Derive the general formula used for signal propagation over flat open area	remembering	A
13	Explain foliage losses and propagation in near in distance	apply	C
14	Explain long distance propagation	apply	C
15	Explain space diversity antenna in detail	understanding	B
16	Explain umbrella pattern antennas	Creating	C
17	Explain broad band umbrella pattern antennas	Analyze	C
18	Explain radiation pattern of normal umbrella pattern antennas	Understand	B
19	Explain about minimum separation of cell site receiving antennas	Analyze	C
20	Explain horizontally oriented space diversity antennas	Understand	B

Unit 4

S. No.	Question	Blooms Taxonomy Level	Course Outcomes
1.	What is by frequency management	Analyzing	a
2.	What is by channel management	Analyzing	a
3.	differentiate the terms frequency management and channel management	Understand	a
4.	Write short note on set up channels	Analyzing	a
5.	List few points on frequency spectrum utilization	Analyzing	a
6	What is known as access channels	Analyzing	b
7	What is known as FOCC	Analyzing	b
8	Define paging channel	Analyzing	a
9	Give the equation for the number of calls in the cell site	Analyzing	b
10	How voice channel and SAT	Analyzing	b
11	What is the significance of SAT	Analyzing	**A**
12	How voice channel can be selected	Analyzing	B
13	Draw an underlay and overlay structures	Analyzing	C
14	What is the use of tilted antennas	Analyzing	A
15	Write short note on channel sharing	Analyzing	A
16	Differentiate channel sharing and borrowing	Analyzing	C
17	Define adjacent channel assignment	Analyzing	B
18	What is meant by fixed channel assignment	Analyzing	B
19	Define sectorization	Analyzing	B
20	Write short note on non fixed channel assignment	Analyzing	B
21	What is RECC	Analyzing	C
22	The FOCC is also known as	understanding	C
23	What is the main function of FOCC in cell site	understanding	A
24	All the set up channel carries only	understanding	A
25	In a cell how many set up channel are generally present	Analyzing	A
26	In normal case ,how many setup channel can be used for paging and accessing	Analyzing	A
27	The main function of frequency management is	understanding	A
28	In set up channel every two way channel contains a bandwidth of	understanding	A
29	What are the types of setup channels	Analyzing	A
30	Allocation of specific channels to a cell site is known as	understanding	a

LONG ANSWER QUESTIONS			
1	Explain setup ,paging and access channel	Analyzing	B
2	Explain numbering and grouping concept in detail	Analyzing	B
3	Explain frequency channel utilization and significance of frequency management chart	Analyzing	A
4	What is known as channel assignment and explain fixed channel assignment	Analysis	C
5	Explain supervisory audio tone ,channel borrowing and channel assignments to traveling mobile units	Analysis	A
6	Explain underlay overlay cellular structures in detail with examples	Analysis	B
7	Explain channel sharing and channel borrowing concepts in detail	Analysis	A
8	Explain cell sectorization technique	Analysis	C
9	Explain non fixed channel assignment in detail	Analysis	B
10	What is known as dynamic channel assignment average blocking and handoff blocking	Analysis	A
11	Explain the numbering of the radio channels	Analysis	A
12	Compare setup and paging	understanding	A
13	Compare setup and access channel	understanding	C
14	Compare paging and access channel	understanding	C
15	Compare setup ,paging and access channel	understanding	B
16	Compare channel sharing and channel borrowing	understanding	C
17	Compare underlay and overlay channels	understanding	C
18	Compare voice channel and setup channels	Understand	B
19	Explain types of setup channels	Analyze	C
20	Explain types of channel assignment	Understand	B

UNIT-5

S.No:	QUESTION	Blooms Taxonomy Level	Course outcome
	SHORT ANSWER QUESTIONS		
1	Definition of Handoff?	remembering	A
2	What are the types of Handoffs?	understanding	B
3	Write a short note on initiation of Handoff.	understanding	B
4	What is known as a delaying of Handoff?	apply	C
5	What are the advantages of Handoffs?	apply	C
6	Define dropped call	understanding	B
7	What will be the number of handoffs 8 per call if cell size is smaller as 3.2 to 8 km?	understanding	B
8	If the cell of 16 to 24 km what will be the number of handoffs per call?	remembering	A
9	Comment on two handoff level algorithm	remembering	A
10	Draw a simple two level handoff scheme diagram	Creating	B
11	What are the advantages of delayed handoffs?	Understand	A
12	What is meant by forced handoff?	Remember	A
13	What is known as handoff queuing?	Remember	A
14	What is a MAHO?	Understand	B
15	Define soft handoff	Understand	C
16	What is the advantage of soft hand off over soft handoff?	Understand	B
17	Write a short note on inter system handoff	Understand	A
18	What is known as dropped call rate?	Understand	A
19	What is meant by controlling a handoff?	Knowledge	B
20	What is known as a hole in handoffs analysis?	Understand	A
21	What is the significance o f handoff?	Knowledge	A
22	In flat ground or in valley interference can be effectively reduced by	Understand	B
23	Write a short note on power difference handoff.	Knowledge	C
24	What is the principle of MAHO?	Understand	C
25	Define hard handoff	Understand	A
26	List the parameters depends on Dropped call rate	Knowledge	C
27	Explain the effects of coverage and interference by power decrease and decrease antenna height.	Understand	B
28	Explain the effects of coverage and interference by power decrease and decrease antenna height.	Knowledge	A
29	What is meant by GPS?	Knowledge	A
30	Write a short note on installation of equipment in vehicle	Knowledge	B

LONG ANSWER QUESTIONS			
1	Explain handoff and handoff types	Analyzing	B
2	Explain handoff and handoff delaying	Analyzing	B
3	Explain handoff delaying and handoff types	Analyzing	A
4	Compare handoff and handoff types	Understand	C
5	Compare handoff and handoff delaying	Understand	A
6	compare handoff delaying and handoff types	Understand	B
7	Explain initiation of handoff	Analysis	A
8	Explain delaying a handoff with an algorithm in detail	Analysis	C
9	What are the advantage of delaying handoff	Understand	B
10	Explain the parameters for handling a handoff	Analysis	A
11	Explain power difference handoff	Analysis	A
12	Explain forced handoff	Analysis	A
13	Explain mobile assisted	Analysis	C
14	Explain soft handoff	Analysis	C
15	Explain inter system handoff	Analysis	B
16	Compare soft handoff and inter system handoff	Understand	C
17	Compare soft handoff and forced handoff	Understand	C
18	Compare inter system handoff and forced handoff	Understand	B
19	Explain dropped call rate in detail	Analyze	C
20	Define handoff ,explain inter system handoff in detail	Understand	B