

(Autonomous)

Dundigal, Hyderabad - 500 043

## **ELECTRONICS AND COMMUNICATION ENGINEERING**

## **TUTORIAL QUESTION BANK**

Course Name	:	WIRELESS COMMUNICATIONS AND NETWORKS
Course Code	:	A80454-R15
Class	:	IV - B. Tech
Branch	:	ECE
Year	:	2018 – 2019
<b>Course Coordinator</b>	:	Mr. MD Khadir, Assistant. Professor, ECE Dept.
<b>Course Faculty</b>	:	Mr. U.Somanaidu, Assistant. Professor, ECE Dept.

## **OBJECTIVE**

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

UNIT-I THE CELLULAR CONCEPT-SYSTEM DESIGN FUNDAMENTALS PART A:(Short Answer Questions)			
1	Define frequency reuse?	Understand	1
2	What is known as foot print?	Understand	1
3	Define frequency planning?	Remember	1
4	What is cellular frequency reuse concept?	Remember	2
5	Define channel assessment strategies?	Understand	2
6	Define borrowing strategies?	Remember	2
7	Demonstrate handoff strategies?	Understand	2
8	What is prioritizing handoffs?	Remember	2
9	Define cell dragging?	Understand	2
10	Distinguish between hard handoff and soft handoff?	Understand	2
11	Define co-channel interference?	Remember	2
12	What is adjacent channel interference?	Understand	2
13	Define setup time?	Remember	2
14	Define holding time?	Remember	1
15	Define grade of service?	Remember	1
16	What is meant by request rate and load?	Understand	1
17	What is trunking efficiency?	Remember	2
18	Define cell splitting?	Understand	2

S. No       Level       Ot         1       Mention the significance of frequency reuse in cellular networks. Explain about frequency reuse strategies?       Understand       Understand         2       Distinguish between fixed channel assignment and dynamic channel assignment in cellular networks?       Understand       Understand         3       Describe the concept of frequency reuse. Derive the equation for the frequency, reuse ratio?       Understand       Understand         4       Consider a cellular system in which the total available voice channels to handle the traffic are 1200.The area of each cell is 9km <sup>2</sup> and the total coverage area of the system is 3600km <sup>2</sup> .Determine the system capacity if the cluster size is 4.       Remember         5       Illustrate the handoff scenario at cell boundary with a neat diagram?       Remember         6       Define signal to interference ratio. Derive the equation of signal to interference ratio for a mobile receiver?       Understand         7       Illustrate the cell splitting with in a 3km by 3km square centered around base station A with a neat diagram?       Remember         10       Explain significance of Omni-directional antenna system.       Understand         9       What is cell-splitting? Explain its types in detail.       Remember         10       Explain significance of Omni-directional antenna system.       Understand         10       Explain significance of Omni-directional antenna system.       R	19	Define sectoring?	Remember	2
21       Transmitter to the receiver end?       Remember         22       Define fading effect?       Remember         23       What is known as Rayleigh fading?       Understand         24       Define co-channel interference reduction factor.       Remember         26       Winti on the co-channel interference reduction factor.       Remember         26       What is meant by frequency reuse distance?       Understand         27       What is meant by macro cell?       Understand         30       What is the value of co-channel interference reduction factor in a 7-cell reuse problem       Understand         31       What is the value of co-cl splitting?       Remember         33       What is the demeri of cell splitting?       Remember         34       Explain any two components of cellular system.       Understand         PART B:(Long Answer Questions)       Blooms Taxonomy Level Or       Or         1       Mention the significance of frequency reuse. In cellular networks. Explain understand about frequency reuse strategies?       Understand         2       Distinguish between fixed channel assignment and dynamic channel assignment in cellular networks?       Remember         3       Describe the concept of frequency reuse. Derive the equation for the lenderstand assignment in cellular networks?       Remember         4	20	What is micro cell zone?	Remember	2
23     What is known as Rayleigh fading?     Understand       24     Define co-channel interference:     Remember       25     Mention the co-channel interference reduction factor.     Remember       26     What is meant by frequency reuse distance?     Understand       27     What are advantages of frequency reuse?     Remember       29     Define micro cells.     Remember       30     What is meant by macro cell?     Understand       31     What is the value of co-channel interference reduction factor in a 7-cell reuse     Understand       32     What is the value of co-channel interference reduction factor in a 7-cell reuse     Understand       33     What is the demerit of cell splitting?     Remember       34     Explain any two components of cellular system.     Understand       PART B:(Long Answer Questions)       S. No     Blooms Taxonomy CC       Level Or       1       Mention the significance of frequency reuse. Derive the equation for the frequency reuse strategies?       2       Distinguish between fixed channel assignment and dynamic channel assignment in cellular networks?       3     Describe the concept of frequency reuse. Derive the equation for the cluster size: 4.       1        Distinguish between fixed channel as	21		Understand	2
24     Define co-channel interference.     Remember       25     Mention the co-channel interference reduction factor.     Remember       26     What is meant by frequency reuse distance?     Understand       27     What are advantages of frequency reuse?     Remember       29     Define micro cells.     Remember       20     What is meant by macro cell?     Understand       31     Pattern?     Remember       32     What is the use of cell splitting?     Remember       33     What is the demerit of cell splitting?     Remember       34     Explain any two components of cellular system.     Understand <b>PART B:(Long Answer Questions)</b> Blooms Taxonomy     Congget the concept of frequency reuse in cellular networks. Explain about frequency reuse strategies?       3     Describe the concept of frequency reuse. Derive the equation for the lassignment in cellular networks?     Understand       2     Disfinguish between fixed channel assignment and dynamic channel assignment in cellular networks?     Remember       3     Describe the concept of frequency reuse. Derive the equation for the lassign the total coverage area of the system is 3600km². Determine the system capacity if the cluster sizeis 4.     Remember       5     Illuar state the handoff scenario at cell boundary with a neat diagram?     Remember       6     Define D, Dz, R, R Z for a microcell architecture with N=7?     Unde	22	Define fading effect?	Remember	2
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27       What are advantages of frequency reuse?       Remember         30       What is meant by macro cell?       Understand         31       What is the value of co-channel interference reduction factor in a 7-cell reuse       Understand         32       What is the value of co-channel interference reduction factor in a 7-cell reuse       Understand         33       What is the demerit of cell splitting?       Remember         34       Explain any two components of cellular system.       Understand         PART B:(Long Answer Questions)       Blooms Taxonomy       Cc         5. No       Questions       Blooms Taxonomy       Cc         2       Distinguish between fixed channel assignment and dynamic channel       understand       assignment in cellular networks.         3       Describe the concept of frequency reuse. Derive the equation for the frequency: reuse ratio?       Understand       coverage area of the system in which the total available voice channels to handle the traffic are 1200.The area of each cell is 9km² and the total coverage area of the system is 3600km².Determine the system capacity if the cluster size is 4.       Inderstand         5       Illustrate the handoff scenario at cell boundary with a neat diagram?       Remember         6       Define D, D, R, Rz for a microcell architecture with N=7?       Understand         7       Illustrate the cell splittin with in a 3km by 3km square centered ar	25	Mention the co-channel interference reduction factor.	Remember	1
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31       What is the value of co-channel interference reduction factor in a 7-cell reuse Pattern?       Understand         32       What is the use of cell splitting?       Remember         33       What is the demerit of cell splitting?       Remember         34       Explain any two components of cellular system.       Understand         PART B:(Long Answer Questions)       Blooms Taxonomy Components of cellular system.       Understand         7       Mention the significance of frequency reuse in cellular networks. Explain about frequency reuse strategies?       Understand         3       Describe the concept of frequency reuse. Derive the equation for the frequency reuse ratio?       Understand         3       Describe the concept of frequency reuse. Derive the equation for the cluster size 4.       Remember         4       Consider a cellular system in which the total available voice channels to handle the traffic are 1200. The area of each cell is 9km² and the total coverage area of the system is 3600km². Determine the system capacity if the cluster size 4.       Inderstand         5       Illustrate the call splitting with in a 3km by 3km square centered around base station A with a neat diagram?       Remember         6       Define D, Dz, R, Rż for a microcell architecture with N=??       Understand         9       What is cell-splitting? Explain its types in detail.       Remember         10       Explain significance of mini-directional anten	29	Define micro cells.	Remember	2
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frequency reuse ratio?       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1 <td>2</td> <td>Distinguish between fixed channel assignment and dynamic channel</td> <td>Understand</td> <td>2</td>	2	Distinguish between fixed channel assignment and dynamic channel	Understand	2
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6       Define signal to interference ratio. Derive the equation of signal to interference ratio for a mobile receiver?       Understand         7       Illustrate the cell splitting with in a 3km by 3km square centered around base station A with a neat diagram?       Understand         8       Define D, Dz, R, Rz for a microcell architecture with N=7?       Understand         9       What is cell-splitting? Explain its types in detail.       Remember         10       Explain significance of Omni-directional antenna system.       Understand         PART C: (Analytical Questions)       Blooms       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.       Remember         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       Remember         3       Assume a cellular system operates with traffic of 2500 Erlangs. If each user in the system uses phone for 3 minutes of busiest hour on an average case, then find the number of users which can be accommodated under even distribution       Understand         4       A receiver equivalent noise figure value is 3 db. Find its equivalent noise       Understand	4	handle the traffic are 1200.The area of each cell is 9km <sup>2</sup> and the total coverage area of the system is 3600km <sup>2</sup> .Determine the system capacity if the		1
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station A with a neat diagram?       Image: Construct of the system operates with a neat diagram?         8       Define D, Dz, R, Rz for a microcell architecture with N=7?       Understand         9       What is cell-splitting? Explain its types in detail.       Remember         10       Explain significance of Omni-directional antenna system.       Understand         PART C: (Analytical Questions)         S. No       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.       Remember         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       Remember         3       Assume a cellular system operates with traffic of 2500 Erlangs. If each user in the system uses phone for 3 minutes of busiest hour on an average case, then find the number of users which can be accommodated under even distribution       Understand         4       A receiver equivalent noise figure value is 3 db. Find its equivalent noise       Understand	6		Understand	2
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PART C: (Analytical Questions)         S. No       Questions       Blooms Taxonomy Level       Out         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.       Remember       Image: 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       Remember       Image: 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       Image: 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       Image: 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       Image: 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       Image: Consider a metropolitan area of 1100 square km is to be covered by cells metropolitan area of 1100 square km is to be covered by cells the system uses phone for 3 minutes of busiest hour on an average case, then find the number of users which can be accommodated under even distribution       Image: Constant area of 1100 square km is 3 db. Find its equivalent noise         4       A receiver equivalent noise figure value is 3 db. Find its equivalent noise       Image: Constant area of 1100 square km is 3 db. Find its equivalent noise	9	What is cell-splitting? Explain its types in detail.	Remember	1
S. No       Questions       Blooms Taxonomy Level       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.       Remember       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       Remember       Understand         3       Assume a cellular system operates with traffic of 2500 Erlangs. If each user in the system uses phone for 3 minutes of busiest hour on an average case, then find the number of users which can be accommodated under even distribution       Understand         4       A receiver equivalent noise figure value is 3 db. Find its equivalent noise       Understand	10	Explain significance of Omni-directional antenna system.	Understand	2
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with cell radius of 2 km. Calculate the number of cells that would be needed       Image: cellular system operates with traffic of 2500 Erlangs. If each user in the system uses phone for 3 minutes of busiest hour on an average case, then find the number of users which can be accommodated under even distribution       Understand         4       A receiver equivalent noise figure value is 3 db. Find its equivalent noise       Understand	1	average calling time't' is 1.76 minutes. Calculate the offered load in the	Remember	1
in the system uses phone for 3 minutes of busiest hour on an average case, then find the number of users which can be accommodated under even distribution       Image: Comparison of the system can be accommodated under even distribution         A       A receiver equivalent noise figure value is 3 db. Find its equivalent noise       Understand	2	with cell radius of 2 km. Calculate the number of cells that would be needed	Remember	1
	3	in the system uses phone for 3 minutes of busiest hour on an average case, then find the number of users which can be accommodated under even distribution	Understand	1
	4		Understand	2

5	Consider a cellular system which consists of 34 cells with the cell radius as 1.4 km. a total frequency bandwidth is capable of supporting 343 traffic channels. Find what geographical area in km can be covered and the number of channels available per call.[Assume N=7 reuse cellular pattern].	Understand	2
6	For a seven cell reuse pattern find the reuse factor if the minimum distance between centers of co-channel-cells is 18 km. Radius of cell is 3 km and the distance between adjacent cells in the seven cell pattern is 6 km.	Remember	2
7	Assume a cellular phone transmitter has deviation of 11 kHz frequency. If the transmitter operates at a maximum deviation with voice frequencies 500 Hz and 3500 Hz, calculate their modulation index value.	Understand	2
8	The coverage area of a cellular system is 2000sq km with each cell having a radii of 5sq km, and there are a total of 1000 radio channels available for handling the traffic, calculate the system capacity for 7 cell reuse.	Understand	1
	UNIT –II		
рарт	MOBILE RADIO PROPOGATION A(Short Answer Questions)		
		Blooms Taxonomy	Course
S. No	Questions	Level	Outcome
1	Define free space propagation model?	Remember	3
2	Relation between gain of an antenna to its effective aperture (A <sub>e</sub> )?	Understand	3
3	Define effective isotropic radiated power(EIRP)	Understand	3
4	Define path loss?	Understand	3
5	Define reflection and diffraction?	Remember	3
6	Define Brewster angle?	Remember	3
7	Write the equation for long distance path loss model?	Understand	3
8	Write short notes on ray tracing?	Remember	4
9	Define scattering?	Understand	4
10	Classification of indoor propagation model?	Remember	4
11	What are the basic propagation mechanisms?	Understand	4
12	Classification of outdoor propagation model?	Understand	4
PART	B (Long Answer Questions)		
S. No	Questions	Blooms Taxonomy Level	Course Outcome
1	Explain how the two-ray model is used when a single ground reflection	Remember	3
	dominates the multipath effect?		
2	How the received signal strength is predicted using the free space propagation model? Explain?	Remember	3
3	Classify the outdoor propagation model? Discuss in detail?	Understand	3
4	Classify the indoor propagation model? Discuss in detail?	Understand	4
5	Explain about Fresnel zone geometry model?	Remember	4
6	Explain the advantages and disadvantages of tw ay ground reflection model in the analysis f the path loss.	Understand	4
7	Illustration of knife-edge diffraction geometry model?	Understand	4
8	Show that the Brewster angle is given by $\theta_i$ where $\sin \theta_i = \sqrt{\epsilon_r^2 - \epsilon_r} / \sqrt{\epsilon_r^2} - 1$	Understand	4
9	Explain the dependence of surface roughness on the frequency and angle of incidence.	Remember	4
10	State and Explain in detail about attenuation factor model ?	Remember	4
11	Explain in detail about effective isotropic radiated power(EIRP)?	Understand	3

PART (	C: (Analytical Questions)		
S. No	Questions	Blooms Taxonomy Level	Course Outcome
1	Find the fraunhoher distance for an antenna with maximum dimension of 1m and operating frequency of 900MHz.If antenna have unity gain. Calculate the path loss?	Remember	3
2	If a transmitter produce 50W of power express the transmit power in units of dBm ,dBW.If 50W is applied to a unity gain antenna with 900MHz carrier frequency ,find the receiver power in dBm at a free space distance of 100m from the antenna. What is $P_r(10KM)$ ?assume unity gain receiver antenna.	Remember	3
3	A mobile is located at 5KM away from a base station and uses a vertical $\lambda/4$ monopole antenna with a gain of 2.55dB to receive cellular radio signals. The E field at 1KM from the transmitter is measured to be 10 <sup>-3</sup> V/m.The carrier frequency used for the system is 900MHz.Find the received power at the mobile using the two-ray ground reflection model. Assuming the height of the transmitting antenna is 50m and the receiving antenna is 1.5m above ground.	Understand	4
	UNIT-III		
	MOBILE RADIO PROPOGATION		
PART A	A (Short Answer Questions)		
S. No	Questions	Blooms	Course
	_	Taxonomy Level	Outcome
1	Define small scale multipath propagation?	Remember	5
2	Define multipath?	Remember	5
3	Relationship between bandwidth and received power?	Understand	5
4	What are the techniques classified for the small scale multipath measurements?	Remember	5
5	What are the parameters of time dispersion?	Understand	5
6	Define Doppler spread and coherence time?	Understand	5
7	Define coherence bandwidth?	Remember	5
8	Write any two differences between frequency selective fading and flat fading?	Remember	5
9	Write the parameters of time dispersion parameters?	Remember	5
10	Write the factors influencing of small scale fading?	Understand	5
11	Draw the block diagram of direct RF channel impulse response measurement System?	Understand	5
12	Draw the block diagram of direct spread spectrum channel impulse response measurement System?	Understand	5
13	What are the parameters of mobile multipath channels?	Understand	5
14	State Spread Spectrum Sliding Correlator Channel Sounding?	Understand	5
15	Define Frequency Domain Channels Sounding?	Understand	5
16	Define mean excess delay?	Understand	5
17	Define rms delay spread?	Understand	5
18	Write multipath shape factors for small scale fading?	Understand	6
19	Define received power?	Remember	6
20	Define received envelope?	Understand	6
21	Differences between Rayleigh distribution and Ricean distribution?	Understand	6
22	What are the types of small scale fading?	Understand	6
23	Mention average fade duration?	Understand	6
24	Define frequency selective fading?	Remember	6
25	State fast fading?	Understand	6

26		Understand	6	
	State slow fading?	Remember	6	
27	Define Rayleigh fading distribution?			
28	What is two Rayleigh fading model?	Understand	6	
29	What is SIRCIM?	Understand	6	
30	What is SMRCIM?	Remember	6	
31	What is multipath share factor?	Remember	6	
32	Define angular spread?	Understand	6	
33	What is angular constriction?	Understand	6	
PART B	(Long Answer Questions)	1		
S. No	Questions	Blooms Taxonomy Level	Course Outcome	
1	Define small scale fading .Write the factors influencing fading?	Understand	5	
2	Explain about impulse response model of a multipath channel?	Understand	5	
3	Classification of the small scale multipath measurements and explain in detail about direct RF pulse system measurement with a block diagram?	Understand	5	
4	Explain in detail about spread spectrum channel impulse response measurement system with a neat block diagram?	Understand	5	
5	Explain in detail about frequency domain channel impulse response measurement system with a neat block diagram?	Understand	5	
6	What are the parameters of mobile multipath channels? Write brief notes of each parameter of mobile multipath channels?	Understand	6	
7	Discuss about small scale fading based on multipath delay spread in detail?	Understand	6	
8	Discuss about small scale fading based on Doppler spread in detail?	Understand	6	
9	Simulation of clerk and Gans fading model using quadrature amplitude modulation with RF Doppler filter and baseband Doppler filter with neat diagram?	Understand	6	
10	Explain about two-ray Rayleigh fading model?	Understand	6	
11	Explain about the multipath shape factors for small scale fading in detail?	Understand	6	
PART C	: (Analytical Questions)	·		
		Blooms	Course	
S. No	Questions	Taxonomy Level	Outcome	
1	For a Rayleigh fading signal find	Remember	5	
	<ul> <li>a) Number of zero level crossings</li> <li>b) The average fade duration for threshold levels ρ=0.1 and ρ=1 when Doppler frequency is 20Hz.</li> </ul>			
2	For a Rayleigh fading signal find the average fade duration for threshold levels $\rho=0.1$ and $\rho=1$ when Doppler frequency is 30Hz.	Remember	6	
UNIT-IV EQUALIZATION AND DIVERSITY				
PART A	A(Short Answer Questions)	DI		
S. No	Questions	Blooms Taxonomy Level	Course Outcome	
1	Define diversity?	Understand	7	
2	Define equalization?	Remember	7	
3	What are the different receiver diversity combining techniques?	Understand	7	
4	What is prediction error?	Remember	7	
5	Classification of equalizers in communication receiver?	Remember	7	
6	Define the types of linear equalizers?	Understand	7	
7 8	Define the types of nonlinear equalizers?	Remember	7	
ð	What is mean by rate of convergence?	Remember	8	

9	What are the factors present in algorithms for adaptive equalization?	Understand	8		
10	Define zero forcing algorithm?	Remember	8		
11	Write short notes on least mean square algorithm?	Remember	8		
12	Define polarization diversity?	Understand	8		
13	What are the classifications of space diversity reception method?	Understand	8		
14	Difference between frequency diversity and time diversity?	Remember	8		
15	Define rake receiver?	Understand	8		
PART I	PART B(Long Answer Questions)				
S. No	Questions	Blooms	Course		
<b>D</b> •110	C C	Taxonomy Level	Outcome		
1	What are the different receiver diversity combining techniques? Explain in detail.	Understand	7		
2	Explain the algorithms for adaptive equalization ?	Understand	7		
3	Explain fundamental concept of equalization?	Understand	7		
4	Explain maximum likelihood sequence estimation(mlsc) equalizer?	Remember	7		
5	Explain a simplified communications system using an adaptive equalizer at the receiver with neat diagram?	Understand	7		
6	Discuss in detail about the categories of the practical space diversity considerations?	Understand	7		
7	Explain the structure of linear equalizer techniques in detail?	Understand	8		
8	Explain the structure of nonlinear equalizer techniques in detail?	Understand	8		
9	Derive the equation of maximul ratio combining improvement?	Remember	8		
10	Derive the equation of selection diversity improvement?	Remember	8		
11	Write the short notes on theoretical model for polarization diversity?	Understand	8		
12	Draw the neat block diagram of an M branch rake receiver implementation?	Understand	8		
PART	C: (Analytical Questions)				
		Blooms	Course		
S. No	Questions	Taxonomy Level	Outcome		
1	Derive the equation of maximal ratio combining improvement?	Remember	7		
2	Derive the equation of selection diversity improvement?	Remember	7		
2	Derive the equation of selection diversity improvement? UNIT-V WIRELESS NETWORKS				
2	Derive the equation of selection diversity improvement? UNIT-V	Remember	7		
2	Derive the equation of selection diversity improvement? UNIT-V WIRELESS NETWORKS				
2 <b>PART</b> .	Derive the equation of selection diversity improvement? UNIT-V WIRELESS NETWORKS A(Short Answer Questions)	Remember Blooms	7 Course		
2 PART 2 S. No 1	Derive the equation of selection diversity improvement? UNIT-V WIRELESS NETWORKS A(Short Answer Questions) Questions	Remember Blooms Taxonomy Level	7 Course Outcome		
2 PART . S. No 1 2	Derive the equation of selection diversity improvement? UNIT-V WIRELESS NETWORKS A(Short Answer Questions) Questions List out the wireless topologies? Define hyper LAN?	Remember Blooms Taxonomy Level Remember Understand	7 Course Outcome 9 9 9		
2 PART 2 S. No 1 2 3	Derive the equation of selection diversity improvement? UNIT-V WIRELESS NETWORKS A(Short Answer Questions) Questions List out the wireless topologies? Define hyper LAN? Write the advantages of wireless LAN?	Remember Blooms Taxonomy Level Remember Understand Understand	7 Course Outcome 9 9 9 9		
2 PART . S. No 1 2 3 4	Derive the equation of selection diversity improvement? UNIT-V WIRELESS NETWORKS A(Short Answer Questions)  List out the wireless topologies? Define hyper LAN? Write the advantages of wireless LAN? Write the disadvantages of wireless LAN?	Remember  Remember  Remember  Understand Remember	7 <b>Course</b> <b>Outcome</b> 9 9 9 9 9		
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2.	Explain, when does a WLAN become a personal area network(PAN)?	Understand	10
3.	Determine the characteristics of HIPER LAN?	Understand	9
4.	What are the different topologies of wireless LAN? Explain in detail.	Understand	9
5.	Comparison between the IEEE 802.11 a,b,g and n standards?	Remember	10
6.	Explain in detail about wireless local loop? List out the advantages and disadvantages of the wireless loop?	Understand	10
7.	Discuss in detail about IEEE 802.11 medium access control?	Remember	10
8.	State and explain about IEEE 802.11 a standard?Detemine the properties of IEEE 802.11 a.	Remember	10
9.	State and explain about IEEE 802.11 b standard?Detemine the properties of IEEE 802.11 b.	Remember	10
10.	State and explain about IEEE 802.11 g standard?Detemine the properties of IEEE 802.11 g.	Remember	10
PART C: (Analytical Questions)			
S. No	Questions	Blooms Taxonomy Level	Course Outcome
1	Discuss in detail about the enhancement of IEEE 802.16 standards?	Remember	10
2	Explain in detail about the performance of integration of the exisiting wieless networks.	Remember	10

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