



P.E.S. College of Engineering, Mandya - 571 401
(An Autonomous Institution affiliated to VTU, Belagavi)
Fifth Semester, B.E. - Electronics and Communication Engineering
Semester End Examination; Feb. - 2021
Fundamentals of Wireless Communication

Time: 3 hrs

Max. Marks: 100

Note: I) PART - A is compulsory. Two marks for each question.II) PART - B: Answer any **Two** sub questions (from a, b, c) for Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks
I : PART - A		10
I a.	Define Half Duplex and Page.	2
b.	List the different steps involved in handoff procedure.	2
c.	What will be the far-field distance for a base station antenna with largest dimension $D = 0.5$ m, frequency of operation $f_c = 900$ MHz.	2
d.	What is location management in GSM system?	2
e.	What is in channel signaling?	2
II : PART - B		90
UNIT - I		18
1 a.	With the help of a diagram, explain wire line (PSTN) to mobile (cellular) call procedures.	9
b.	i) Describe the paging system with the aid of block diagram.	6
	ii) List any three differences between wireless and fixed telephone networks.	3
c.	Write short notes on the following :	
	i) Wireless local loop	9
	ii) LMDS	
UNIT - II		18
2 a.	Derive an equation for signal to interference noise in terms of i_s and N .	9
b.	If a total 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channel to provide full duplex voice and control channels. Calculate the number of channel available per cell. If a system uses,	9
	i) 4 cell reuse ii) 7 cell reuse iii) 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 of the two systems.	
c.	A cellular service provider decides to use a digital TDMA scheme which can tolerate a signal to interference ratio of 15 dB in the worst case. What is the frequency reuse factor and cluster size that should be used for maximum capacity, if the path loss exponents is; i) $n = 4$ and ii) $n = 3$. Assume that there are six co-channel cells in the first tier, and all of them are at the same distance from the mobile. Use suitable approximations.	9

UNIT - III**18**

- 3 a. Briefly explain the free space propagation model with related equation. 9
- b. Explain the factors influencing small scale fading. 9
- c. Consider a transmitter which radiates a sinusoidal carrier frequency of 1850 MHz for a vehicle moving 60 mph. Compute the received carrier frequency if the mobile is moving;
- i) Directly towards the transmitter 9
- ii) Directly away from the transmitter
- iii) In a direction which is perpendicular to the direction of arrival of the transmitted signal

UNIT - IV**18**

- 4 a. Write the functional architecture of GSM system and explain. 9
- b. Briefly discuss the modulation process in forward CDMA channel with a neat block diagram. 9
- c. Explain the five functional entities of DECT system with a neat block diagram. 9

UNIT - V**18**

- 5 a. Explain SS7 protocol architecture with a neat block diagram. 9
- b. Describe the cellular digital packet data network with the help of block diagram. 9
- c. Explain the features and functional blocks of an Integrated Services Digital Network with the help of diagram. 9

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