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Code No. : 16118 (D)

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**B.E. (CBCS) VI-Semester Main Examinations, January-2021****Introduction to Mobile Communication**

(Open Elective-V)

Time: 2 hours

Max. Marks: 60

*Note: Answer any NINE questions from Part-A and any THREE from Part-B***Part-A (9 × 2 = 18 Marks)**

Q. No.	Stem of the question	M	L	CO	PO
1.	Define Forward Channel and Reverse Channel	2	2	1	1
2.	Write the formula to calculate the Cluster size. Give two examples of valid cluster size.	2	3	1	1,2
3.	If a transmitter produced 50W of power with a 900MHz carrier frequency. Determine the received power at a free space distance of 100 m from the antenna. [Assume $G_t = G_r = L = 1$]	2	3	2	1,2
4.	Contrast between Large scale fading and small scale fading.	2	2	2	1
5.	Define Coherence bandwidth.	2	1	3	1
6.	Distinguish between Frequency –flat and Frequency –selective fading channels.	2	2	3	1
7.	What is the significance of multiple access techniques?	2	1	4	1
8.	If a cellular operator is allocated total BW of 12.5MHz for each simplex band, guard band is 10KHz and channel BW is 30KHz. Determine the number of channels in an FDMA system.	2	3	4	1
9.	Write the Forward and Reverse channel frequencies of a GSM System?	2	3	5	1,2
10.	Estimate frame efficiency if a normal GSM time slot consists of 8 trailing bits, 8 guard bits, 26 training bits and three traffic bursts of 58 bits of data.	2	3	5	1,2
	Compare 1G and 2G technologies.	2	2	1	1
	Define Doppler spread.	2	1	2	1
Part-B (3 × 14 = 42 Marks)					
	Elaborate on various techniques for improving coverage and capacity of a cellular system.	9	2	1	1,2
	What is meant by Frequency reuse? Explain different Frequency reuse schemes.	5	1	1	1,2

Contd... 2

14. a)	Derive an expression for power received by the receiver at a distance(d) from transmitter using free space propagation model.	7	3	2	1,2
b)	Emphasize on the three basic propagation mechanisms.	7	1	2	1,2
15. a)	Discuss various parameters that are used to characterize mobile multipath channels.	8	2	3	1,2
b)	In the U.S. Digital cellular System, if $f_c = 900$ MHz and the mobile velocity is 70 km/hr, calculate the received carrier frequency if the Mobile (a) directly toward the Transmitter, (b) directly away from the transmitter, and (c) in a direction perpendicular to the direction of the arrival of the transmitted signal.	6	3	3	1,2
16. a)	Distinguish between FDMA and CDMA	8	2	4	1,2
b)	Find the Maximum Throughput achieved for Pure ALOHA and Slotted ALOHA?	6	3	4	1,2
17. a)	Differentiate between GSM forward and reverse channels.	6	2	5	1,2
b)	Present the architecture of GSM system and emphasize on the features of GSM.	8	2	5	1,2
18. a)	Explain different channel assignment strategies.	6	2	1	1,2
b)	Discuss two -ray ground reflection path loss model	8	2	2	1,2
19.	Answer any <i>two</i> of the following:				
a)	Emphasize on various types of small scale fading.	7	2	3	1,2
b)	Derive an expression for frame efficiency of TDMA system.	7	3	4	1,2
c)	Draw the GSM frame structure and explain.	7	2	5	1,2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	72
2	Knowledge on application and analysis (Level-3 & 4)	28
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	0
