

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION MO-2022)**

CLASS: M.Tech/Pre-PhD
BRANCH: ECE

SEMESTER : I
SESSION : MO-2022

SUBJECT: EC503 COMMUNICATION SYSTEMS AND NETWORKS
TIME: 03 Hours **FULL MARKS:** 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 3. The missing data, if any, may be assumed suitably.
 4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates
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Question No.	Question	Marks
Q.1(a)	Discuss the advantages of IEEE802.11g over IEEE802.11a and IEEE802.11b.	[2]
Q.1(b)	Briefly explain fixed WiMAX standard in comparison to Mobile WiMAX standard.	[3]
Q.1(c)	Compare Bluetooth, ZigBee and Ultra-wide band communications.	[5]
Q.2(a)	Explain the terms “universal frequency reuse” and “fractional frequency reuse.”	[2]
Q.2(b)	What do you mean by hand-off in a cellular system? Illustrate a handoff scenario at cell boundary using power level consideration.	[3]
Q.2(c)	For path loss exponents $n=4$, Determine the cluster size that should be used for the maximum capacity. The signal-to-interference ratio of 15dB is the minimum required for the satisfactory forward channel performance of a cellular system. There are six co-channel cells in the first tier, and all of them are at the same distance from the mobile.	[5]
Q.3(a)	Highlight a few key differences between LTE and LTE-A.	[2]
Q.3(b)	Compare the pure ALOHA with slotted ALOHA in terms of its operation, vulnerability period and throughput.	[3]
Q.3(c)	Draw GPRS architecture and elaborate along with required interfaces.	[5]
Q.4(a)	Discuss the importance of pulse shaping filters.	[2]
Q.4(b)	Explain the cognitive radio cycle.	[3]
Q.4(c)	Draw the block diagram of a MIMO-OFDM system and explain.	[5]
Q.5(a)	Compare an infrastructure based wireless network with an infrastructure less wireless network and provide suitable example.	[2]
Q.5(b)	Briefly describe IPv4 and IPv6.	[3]
Q.5(c)	Discuss the challenges of WSN and elaborate how a WSN is different from MANET.	[5]

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