

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

**CLASS: MTECH
BRANCH: ECE**

**SEMESTER : 1st
SESSION : MO/2024**

SUBJECT: EC503 COMMUNICATION SYSTEMS AND NETWORKS

TIME: 3 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. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q.1(a)	Explain the major challenges of wired and wireless communication. Discuss the advantages of IEEE802.11g over IEEE802.11a and IEEE802.11b.	[5] 1	2
Q.1(b)	What could be the various application of RFID? Discuss the working of RFID. How it is different from barcode?	[5] 1	3
Q.2(a)	What do you mean by hand-off in a cellular system and how it is affected based on type of hand-offs (universal and fractional)? Illustrate a handoff scenario at cell boundary using power level consideration.	[5] 2	3
Q.2(b)	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] 2	4
Q.3(a)	What protocol layers are contained within eNodeB? Discuss the radio frames structures used for FDD and TDD modes in LTE.	[5] 3	2
Q.3(b)	Draw GPRS architecture and elaborate along with required interfaces.	[5] 3	3
Q.4(a)	Explain the several components of cognitive radio network.	[5] 4	3
Q.4(b)	What is the advantage of OFDM system used in combination with MIMO system? Draw the block diagram of a MIMO-OFDM system and explain.	[5] 4	4
Q.5(a)	What is the need of wireless ad-hoc network? Discuss its challenges. Elaborate how a wireless sensor network is different from MANET?	[5] 5	3
Q.5(b)	Briefly describe IPv4 and IPv6. Which one is more favorable in current scenario and why?	[5] 5	2

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