

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

**CLASS: MTECH  
BRANCH: ELECTRONICS AND COMMUNICATION**

**SEMESTER : II  
SESSION : SP/2025**

**SUBJECT: EC526 ADVANCED WIRELESS TECHNOLOGIES**

**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)	Draw the labelled diagram of a 2G architecture. Describe the functions of a Mobile Switching Center (MSC).	[5] 1	2
Q.1(b)	Mention the key technology components of LTE Advanced. Describe the working of the relays.	[5] 1	2
Q.2(a)	Draw the labelled diagram of an analog beamforming transceiver. Describe the process of digital beamforming in detail.	[5] 2	2
Q.2(b)	Draw the labelled diagram of a typical CoMP architecture. Discuss the improvement of SNR at the cell-edge users using downlink joint processing CoMP.	[5] 2	2
Q.3(a)	Mention the differences between infrastructure-based and ad-hoc networks. Explain with the help of a diagram the hidden terminal problem in an ad-hoc network.	[5] 3	2
Q.3(b)	Draw the labelled diagram of a typical CRAN architecture. Discuss in detail the transport network of a CRAN architecture.	[5] 3	2
Q.4(a)	Mention the different types of fading present in a wireless channel. Discuss in detail the various reasons for large-scale fading in a wireless communication.	[5] 2	2
Q.4(b)	Explain the power delay profile (PDP) of a wireless channel. Derive an approximate expression for the channel coherence time.	[5] 2	3
Q.5(a)	Mention the different types of multiple access schemes. Discuss in detail the orthogonality of subcarriers in an OFDM modulation scheme.	[5] 4	3
Q.5(b)	Discuss the beam division multiple access (BDMA) scheme in detail.	[5] 4	2

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