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

CLASS: MTECH (WC) / Pre-PhD   SEMESTER-II

BRANCH: ECE   SESSION: SP-2022

SUBJECT: EC601 ADVANCED WIRELESS COMMUNICATION

TIME: 2 HRS   FULL MARKS: 50

INSTRUCTIONS:
1. All questions are compulsory.
2. The missing data, if any, may be assumed suitably.
3. Before attempting the question paper be sure that you have got the correct question paper.

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1. a) Highlight a few key differences between LTE and LTE-A. **[02]**

   b) In what respect OFDM is advantageous over Multi carrier modulation? **[03]**

   c) Draw a structure of PRB. Compare the technical requirements between 5G and 6G w.r.t eight representative KPIs. **[05]**

2. a) What is pilot contamination? **[02]**

   b) Discuss Spatial multiplexing and Spatial diversity trade-off in MIMO. **[03]**

   c) Draw a block diagram of mm Wave MIMO system using Analog beamforming. **[05]**

3. a) Explain Ambient Intelligence. **[02]**

   b) What do you mean by massive MIMO? Discuss its applications in 5G communication. **[03]**

   c) Explain the scenario of using Intelligent Reflecting Surface in place of relay for the communication between source to destination under blockage highlight the expression for spectral efficiency. **[05]**

4. a) Describe the operation of OFDM. How it differs from FDM system? **[02]**

   b) What do you mean by fading? Discuss various types of small-scale fading. **[03]**

   c) Describe Role of machine learning in channel modelling. **[05]**

5. a) Why is NOMA preferred for 5G? **[02]**

   b) Discuss the role of superposition coding in power domain NOMA. **[03]**

   c) Explain Vandermonde-subspace frequency division multiplexing (VFDM). **[05]**

------25.04.2022-------