

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

**CLASS: BE  
BRANCH: ECE**

**SEMESTER: VII/ADD  
SESSION : MO/2018**

**SUBJECT : EC7201 MOBILE AND CELLULAR COMMUNICATION**

**TIME: 1.5 HOURS**

**FULL MARKS: 25**

**INSTRUCTIONS:**

1. The total marks of the questions are 30.
  2. Candidates may attempt for all 30 marks.
  3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. The missing data, if any, may be assumed suitably.
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- Q1 (a) Show the various upgrade paths for cellular 2G technologies in a pictorial form. [2]  
(b) Briefly explain wireless local loop (WLL) and local multipoint distribution services (LMDS). [3]
- Q2 (a) Briefly explain wireless personal area network (WPAN) and its several task group formed. [2]  
(b) Draw the UMTS architecture and briefly explain. [3]
- Q3 (a) What do you mean by frequency management and channel assignment? Discuss various channel assignment strategies. [2]  
(b) Why an umbrella cell approach is needed? If 66 MHz of total spectrum is allocated for a duplex wireless cellular system and each simplex channel has 25 kHz RF bandwidth, find the total number of channels per cell site, if N=7 cell reuse is used. [3]
- Q4 (a) Explain frequency reuse in cellular system. How universal frequency reuse is different from fractional frequency reuse? [2]  
(b) If S/I ratio of 18 dB is required for a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent is 3. Assume that there are six co-channel cells in the first tier, and all of them are at equal distance from the mobile. [3]
- Q5 (a) What do you mean by downlink interference and uplink interference? [2]  
(b) How cell splitting is performed? How sectorization is differs from cell splitting? [3]
- Q6 (a) Explain co-channel and adjacent channel interferences, how they affect the system capacity? [2]  
(b) A base station increases its transmission power by 3 dB. Determine the number of times increase in coverage area for the same minimum acceptable received signal power. [3]

::: 10/09/2018 M :::::