

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

**CLASS: BE
BRANCH: ECE**

**SEMESTER: VII/ADD
SESSION : MO/2019**

SUBJECT : EC7201 MOBILE & 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) List the three types of data flow in wireless communication with examples. [2]
(b) What are the advantages of cellular mobile system over conventional mobile telephone system? With help of diagram explain how call is made in a cellular system. [3]
- Q2 (a) How is 3G cellular communication network different from 2G CDMA cellular networks? [2]
(b) How is data transfer handled in GPRS architecture? How is data routing done and in what respect is it different from voice routing? [3]
- Q3 (a) What are the fundamental differences between WLAN and Bluetooth technologies? [2]
(b) Differentiate between hard handoff, soft handoff and vertical, horizontal handoff. [3]
- Q4 (a) Define co-channel reuse ratio and prove that for hexagonal geometry $Q = \sqrt{3N}$, where $N = i^2 + ij + j^2$. [2]
(b) Derive the relationship between desired S/I and co-channel reuse ratio Q in a 7 cell frequency reuse regular hexagonal pattern. Assume all cells are of equal size and uses Omni directional antennas at the base stations. And also determine the minimum cluster size with an acceptable signal to co-channel interference ratio S/I =18 dB. Assume the path loss exponent as 4. [3]
- Q5 (a) Distinguish between frequency management and channel assignment. [2]
(b) Compare fixed channel assignment, dynamic channel assignment, and hybrid channel assignment schemes in cellular system. Discuss various channel assignments schemes along with channel sharing and channel borrowing techniques. [3]
- Q6 (a) The channel data rate is 270.833kbps in GSM standard that is 40% of theoretical maximum data rate that can be supported in a 200 kHz channel bandwidth. Calculate the corresponding theoretical S/N required. [2]
(b) Explain co-channel and adjacent channel interferences how they affect the system capacity? [3]