Enrolment No._____

HASMUKH GOSWAMI COLLEGE OF ENGINEERING, VAHELAL

MID SEMESTER EXAMINATION SEPTEMBER 2016

Subject Code: 2171004 **Date: 26/9/2016**

Subject Name: Wireless Communication **Sem: 7TH**

Time: 10:00 TO 10:50 **Total Marks: 20**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

QUE.1 a) Prove that for a hexagonal geometry, the co-channel reuse ratio is given by $Q = \sqrt{3N}$, where $N = i^2+ij+j^2$. **4**

b) Which cell shape is preferred for the cellular system? Why? **2**

QUE.2 **(A)** Draw only the architecture of GSM. **3**

(B) If S/I ratio of 15dB is required for satisfactory forward channel performance of 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 (a) n=4, (b) n=3? Assume that there are six co-channel cells in the first tier, and all of them are at same distance from the mobile. Use suitable approximations. **4**

OR

(B) Assume a receiver is located 10 km from a 50W transmitter. The carrier frequency is 900MHz, free space propagation is assumed, $G_t = 1$, $G_r = 2$, Find a) the power at the receiver, b) the magnitude of the E- field at the receiver antenna, c) the rms voltage applied to the receiver input assuming that the receiver antenna has a purely real impedance of 50Ω and is matched to the receiver. **4**

QUE.3 **(A)** Explain the terms: i) Reflection ii) Diffraction iii) Scattering **3**

(B) Discuss the channel assignment strategy. **4**

OR

(A) Explain cell splitting in brief. **3**

(B) Compare the multiple access techniques FDMA, TDMA and CDMA. **4**

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********** ALL THE BEST **********