# C.U.SHAH UNIVERSITY
## Summer Examination-2017

**Subject Name:  Analog Communication**

**Subject Code:  4TE04ACM1**                    **Branch: B.Tech (EC)**

**Semester: 4**            **Date: 08/05/2017**        **Time : 02:00 To 05:00**        **Marks :70**

Instructions:
  (1)  Use of Programmable calculator & any other electronic instrument is prohibited.
  (2)  Instructions written on main answer book are strictly to be obeyed.
  (3)  Draw neat diagrams and figures (if necessary) at right places.
  (4)  Assume suitable data if needed.

**Q-1**          **Define following terms:**                                                    **(14)**
  **(a)**  Noise
  **(b)**  Signal To Noise Ratio
  **(c)**  Q-Factor
  **(d)**  Dynamic Impedance
  **(e)**  Reflection
  **(f)**  Supersonic Heterodyne
  **(g)**  Frequency Deviation
  **(h)**  Isotropic Radiator
  **(i)**  Gain
  **(j)**  Image Frequency
  **(k)**  Sensitivity
  **(l)**  White noise
  **(m)**  Critical Frequency
  **(n)**  Modulation Depth

## Attempt any four questions from Q-2 to Q-8

**Q-2**          **Attempt all questions**                                                    **(14)**
  **(a)**  Explain Super-heterodyne receiver with block diagram.
  **(b)**  Explain AM broadcast transmitter with block diagram.

**Q-3**          **Attempt all questions**                                                    **(14)**
  **(a)**  Write a short note on Johnson Noise.
  **(b)**  Explain AGC and its all types

**Q-4**          **Attempt all questions**                                                    **(14)**
  **(a)**  Explain Diagonal Peak Clipping in detail.
  **(b)**  Prove that SSB transmission results in more efficient use of available power.

**Q-5** **Attempt all questions** **(14)**
   **(a)** Explain Phasing method of SSB generation with suitable diagram.
   **(b)** Explain FM stereo broadcast transmitter with block diagram.

**Q-6** **Attempt all questions** **(14)**
   **(a)** Discuss the equivalence between PM and FM.
   **(b)** Explain Carson's rule and prove that FM is constant bandwidth system.

**Q-7** **Attempt all questions** **(14)**
   **(a)** A modulating signal $10\sin(2*\Pi*10^3 t)$ is used to modulate a carrier signal $20\sin(2*\Pi*10^4 t)$. Find the modulation index, percentage modulation, frequencies of the sideband components and their amplitudes. What is the bandwidth of the modulated signal? Also draw the spectrum of the AM wave.
   **(b)** Two resistors 20 kΩ and 50 kΩ are at room temperature (290K) for a bandwidth of 100 kHz. Calculate thermal noise for each resistor, if two resistors are in series and if two resistors are in parallel.

**Q-8** **Attempt all questions** **(14)**
   **(a)** Explain briefly what Skin effect is and why it is undesirable. Explain steps to reduce skin effect in inductors.
   **(b)** Explain Tropospheric Scatter Propagation.