SE/SEM-III/CBGS/ATKT/IT/MAY-17 18/05/2017

SUB :- PADC

Q.P. Code : 552202

(3 Hours) **[Total Marks : 80]**

Note: 1) Question **No.1** is **compulsory.**
2) Out of remaining attempt **any three**.
3) Assume & mention suitable data wherever required.
4) **Figures** to **right** indicates **full marks**.

1. Solve **any four** **20**
   a) Compare analog and digital communication system.
   b) Define modulation. Explain and justify any two need of modulation.
   c) Explain in brief Pre-emphasis and De-emphasis in FM.
   d) Explain in brief the process of quantization.
   e) What is line coding. Draw the NRZ and Manchester signal for the following binary signal 10111010.

2 a) Explain the term thermal noise. Prove that the noise voltage $V_n = \sqrt{4kTBR}$ For electronic device operating at a temperature of 17°C with a bandwidth of 10 KHz, determine **10**
1. Thermal noise power in dBm. 2. RMS noise voltage for a 100 Ω internal resistance and a 100 Ω load resistance.

b) State and prove time scaling property of Fourier transf01m. Determine the Fourier transform for a rectangular pulse of amplitude 'A' and time period 'T' is from-T/2 to+ T/2 **10**

3. a) An AM signal appears across a 50 Ω load and has the following equation $v(t)= 12(1+ \sin 12.566 \times 10^3 t) \sin 18.85 \times 10^6 t$ volts **10**

i) Sketch the envelope of this signal in time domain.
ii) Calculate modulation index, sideband frequencies, total power and bandwidth.

b) What are the limitations of TRF' receiver. Explain how these limitations are avoided using super heterodyne receiver. **10**

4. a) With the help of neat circuit diagram explain the working of Ratio detector. **10**
   b) What is multiplexing in communication system. Draw and explain in briefthe transmitter and receiver of FDM. **10**

[TURN OVER

5. a) State and prove sampling theorem for low pass band limited signal .Explain aliasing error. **10**

   b) What are the various pulse modulation techniques? Explain how PPM is obtained from PWM. **10**

6. a) Explain in brief the generation and detection of Delta modulation. **10**

   b) Explain the generation and detection of ASK signal with block diagram and waveforms. **10**
