

Roll No. 

Total No. of Pages : 02

Total No. of Questions : 09

**B.Tech. Electronics Engineering (OE 2012 Onwards)/  
(Electrical & Electronics) (OE 2013 Batch)  
(Sem.-6)**

**ELEMENTS OF COMMUNICATION SYSTEM**

Subject Code : BTEEE-OPB

Paper ID : [72839]

Time : 3 Hrs.

Max. Marks : 60

**INSTRUCTIONS TO CANDIDATES :**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

**SECTION-A****Q1. Answer briefly :**

- a. Explain the need of modulation.
- b. What is a band limited signal?
- c. Define high level of modulation.
- d. How much power will be saved if the carrier of a 100 % modulated AM wave is suppressed?
- e. Define Fidelity of receiver.
- f. Explain the difference between wideband and narrow band FM.
- g. Given an angle-modulated signal  $x(t) = 5\cos[10^8\pi t + 10\sin 2\pi \times 10^3 t]$ . Determine the maximum phase deviation.
- h. Define Nyquist rate.
- i. What is overmodulation in AM wave?
- j. What is the need of companding in PCM systems?

**SECTION-B**

- Q2. An audio signal  $20\sin 500\pi t$  is used to amplitude modulate a carrier of  $80\sin 2\pi \times 10^5 t$ . Calculate: Modulated index, Sideband frequencies, Bandwidth required, Total power delivered into a  $600 \Omega$  load and Power saved if one of sideband suppressed.
- Q3. Draw the circuit diagram and discuss working of PAM modulator and PAM demodulator.
- Q4. Draw the block diagram of PLL demodulator and explain its working.
- Q5. a. Discuss the major factors influencing the choice of intermediate frequency of a receiving system,  
b. When a super heterodyne receiver is tuned to 555 kHz, its local oscillator provides the mixer with an input at 1010 kHz. What is the image frequency? The antenna of this receiver is connected to the mixer via tuned circuit whose loaded Q is 40. What will be the rejection ratio for the calculated image frequency?
- Q6. Explain the mode of data transmission.

**SECTION-C**

- Q7. a. Draw the block diagram of delta modulation (DM) system and explain.  
b. A voice frequency signal band limited to 3KHz is transmitted with the use of DM system. The pulse repetition frequency is 30,000 pulses/ sec. and step size is 40mV. Determine the maximum permissible speech signal amplitude to avoid a slope overload.
- Q8. Explain with neat block diagram the modulation and demodulation of FSK.
- Q9. Write a short note on:  
a. Statistical time division multiplexing (STDM).  
b. Noise triangle in FM.