BIEL-032

DIPLOMA – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (DECVI)
Term-End Examination
June, 2015

00906

BIEL-032 : PRINCIPLES OF COMMUNICATION ENGINEERING

Time : 2 hours   Maximum Marks : 70

Note : Attempt any **seven** questions. All questions carry equal marks.

1. Draw the block diagram of communication system. What is the need of modulation in communication system ?   *10*

2. Explain AM modulation and demodulation techniques. Compare AM and FM modulation schemes.   *10*

3. Consider an angle modulated signal $x(t) = 3 \cos [2\pi 10^6 t + 2 \sin (2\pi 10^3 t)]$. Find its

   (a) instantaneous frequency at time

      (i) $t = 0.25$ ms and

      (ii) $t = 0.5$ ms,

   (b) maximum phase deviation,

   (c) maximum frequency deviation.   *10*

4. Explain the working and block diagram of PLL with vector diagram. *10*

5. A carrier which attains a peak voltage of 5 volts has a frequency of 100 MHz. This carrier is frequency modulated by a sinusoidal waveform of frequency 2 kHz to such an extent that the frequency deviation from the carrier frequency is 75 kHz. The modulated waveform passes through zero and is increasing at time t = 0. Write an expression for the modulated carrier waveform. *10*

6. (a) What is AGC ? Explain its types.

   (b) Define Sensitivity, Selectivity and Fidelity of the AM radio receiver. *5+5=10*

7. How does the phase of Carrier vary for the message {m(n)} = {1, 0, 1, 1, 0, 1, ...} in

   (a) BPSK,

   (b) DPSK, and

   (c) DEPSK system ? *10*

8. Draw and explain the block diagram of FM transmitter. Write the mathematical representation of frequency modulation and its meaning. *5+5=10*

9. Explain the following terms :   *10*

   (a)   Antenna resistance

   (b)   Antenna gain

   (c)   Power density

   (d)   Horn antenna

10. The available power required at a receiving antenna is 10^{-6} watt (that is, $-$ 60 dB w.r.t. 1 watt). Transmitting and receiving antennas have gains of 40 dB each. The carrier frequency used is 4 GHz, and the distance between antennas is 30 km. Find the required transmitter power.   *10*