Total No. of printed pages = 4

Et-401/CE-I/4th Sem/2014/N

COMMUNICATION ENGINEERING – I

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) Draw the block diagram of a general telecommunication system and explain briefly its various blocks. 7

   (b) Describe the different types of telecommunication signals used in communication. 7

2. Classify the radio waves with respect to their frequency range, wavelength range, propagation characteristics and uses. 14

3. (a) Define modulation. What is the need for modulating a signal ? Describe the different types of modulation. 2+3+4=9

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(b) Deduce the mathematical expression of an AM wave into the three components LSB, USB and carrier. 5

4. (a) Describe a method to generate FM. 7

(b) Calculate the percentage power saving in an AM modulated wave to a depth of 100%, when the carrier and one of the sidebands are suppressed. 7

5. (a) Why do we suppress the carrier in DSB/SC ? 3

(b) What is VSB system ? 4

(c) Draw the circuit diagram of a balanced modulator and explain its working principle. 7

6. Describe the ground wave and the sky wave propagation of radio waves. Explain its important characteristics and the range of frequency of their propagation with the aid of suitable diagrams. 14

7. (a) What is a transmission line ? What are the different types of transmission lines ? 2+4=6

(b) Describe the various losses of a transmission line. 6

(c) Define the term standing wave ratio as applied to a transmission line. 2

8. (a) Explain how does an antenna radiate electromagnetic energy. 4

(b) Define the following terms related to an antenna : 8

(i) directive gain

(ii) antenna resistance

(iii) antenna efficiency

(iv) radiation pattern.

(c) Draw the radiation pattern of an Yagi-Uda antenna. 2

9. Write short notes on any *two* : 7×2=14

(a) Telephone components and exchange

(b) Resonant and non-resonant antenna

(c) Phase modulation

(d) Layers of the ionosphere

(e) Antenna Arrays

(f) Grounded and ungrounded antennas.