(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2058 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. V) ODD SEMESTER THEORY EXAMINATION 2010-11

COMMUNICATION ENGINEERING

Time : 3 Hours *Total Marks : 100*

Note: Attempt ***all*** questions.

1. Attempt any **four** parts of the following : **(5×4=20)**

   (a) Explain the working of super heterodyne receiver with neat diagram.

   (b) An SSB transmission contains 15 kW. This transmission is to be replaced by a standard amplitude modulated signal with the same power content. Determine the power content of the carrier and each of the sidebands when the percent modulation is 80%.

   (c) Explain the square law diode modulation method for AM generation.

   (d) Determine the percentage power saving when the carrier wave and one of the side bands are suppressed in an AM wave modulated to a depth of

   (i) 100 % (ii) 50 %.

   (e) Explain the working of FDM technique.

   (f) Explain vestigial side band.

2. Attempt any **four** parts of the following : **(5×4=20)**

(a) Explain the difference between narrow band FM and wide band FM.

(b) Explain the Armstrong method for generation of frequency modulation and mention the advantages and disadvantages.

(c) Derive an expression for single tone narrow band frequency modulated wave.

(d) A carrier of 1 MHz frequency and 3 Volt amplitude is frequency modulated by sinusoidal modulating waveform of frequency 500 Hz and of 1 volt peak amplitude. As a result of this frequency gets deviated by 1 kHz. The level of the modulating waveform is now changed to 5 Volt peak and its frequency is changed to 2 kHz. Write the expression of the new modulating waveform.

(e) Compare the FM system with AM system.

(f) Write a short note on : (a) frequency deviation (b) practical Bandwidth.

3. Attempt any **four** parts of the following : **(5×4=20)**

(a) State and prove the sampling theorem in time domain. What is Nyquist rate ?

(b) Compare PAM, PWM and PPM.

(c) An analog signal is expressed by the equation :

$X(t) = 3 \cos 50\pi t + 10 \sin 300\pi t - \cos 100\pi t$

Calculate the Nyquist rate for this signal.

(d) Explain the working of Adaptive delta modulation. Explain how it is useful to overcome quantization error ?

(e) Differentiate between TDM and FDM.

(f) Write a short note on FSK.

4. Attempt any **two** parts of the following : **(10×2=20)**

(a) Describe briefly the salient features of tropospheric propagation. How are the problems of severe fading partly overcome ? Define virtual height, critical frequency, skip distance and maximum usable frequency.

(b) Explain how geostationary satellites play an important role in satellite communication.

(c) Write short notes on :

(i) Atmospheric noise

(ii) Duct propagation.

5. Attempt any **two** parts of the following : **(10×2=20)**

(a) Sketch the image orthicon camera tube and describe its working briefly.

(b) Write a note on fiber characteristics.

(c) Draw the block diagram of a typical monochrome TV receiver and explain its working.