

(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.