GUJARAT TECHNOLOGICAL UNIVERSITY B. E. - SEMESTER - IV • EXAMINATION - WINTER 2012

Subject code: 141102

Subject Name: Communication Engineering

Time: 02.30 pm - 05.00 pm

Instructions:

- 1. Attempt any five questions.
- 2. Make suitable assumptions wherever necessary.
- 3. Figures to the right indicate full marks.
- Explain basics of communication system with the help of necessary block 07 **Q.1** (a) diagram.
 - Discuss the types, causes and effects of the various forms of noise which may be 07 **(b)** created within a receiver or an amplifier.
- Define amplitude modulation and modulation index. Sketch amplitude-modulated Q.2 07 (a) wave. Derive the relation between the output-power of an AM transmitter and the depth of modulation.
 - Describe frequency modulation with the help of necessary wave from and derive 07 **(b)** the formula for the instantaneous value of an FM voltage.

OR

- What is single-side band suppressed-carrier modulation? Explain filter method of 07 **(b)** side band suppression with the help of necessary block diagram.
- 0.3 Explain how the constant intermediate frequency is achieved in the 07 (a) superhetrodyne receiver. List and discuss the factors influencing the choice of the Intermediate frequency for a radio receiver.
 - Describe the differences between FM and AM receivers. What is pre-emphasis? 07 **(b)** Sketch a typical pre-emphasis circuit and explain why de-emphasis must be used.

OR

- **Q.3** What is modem ? Describe the RS-232 interface and explain its value for data 07 (a) transmission.
 - Explain briefly: PCM, FDM, TDM **(b)**
- Q.4 Draw the block diagram of a colour TV receiver, showing all the important 07 (a) function from the tuner to the picture tube. 07
 - Explain briefly: Television systems and standards. **(b)**

OR

- An AM transmitter supplies 10 kW of carrier power to **Q.4** (a) a 50 Ω load. It operates 07 at a carrier frequency of 1.2 MHz and is 80% modulated by a 3 kHz sine wave.
 - Sketch the signal in frequency domain with frequency and power (i) scales. Show the power in dBW.
 - (ii) Calculated the total average power in the signal in watts and in dBW.
 - Calculate the RMS voltage of the signal. (iii)
 - Calculate the peak voltage of the signal. (iv)
 - (b) Two resistors 10 k Ω and 25 k Ω are at room temperature for a bandwidth of 150 07 kHz .Calculate thermal noise for each resistor, if two resistors are in series and two resistors are in parallel. Assume room temperature = 290 K
- Q.5 Explain briefly: Information theory, Telemetry (a)
 - Briefly explain different elements of long distance telephony **(b)** 07 OR

For a silica optical fiber the refractive index of core layer is 1.56 and that of 07 Q.5 (a) cladding is 1.35. calculate critical angle, relative refractive index difference, numerical aperture and acceptance angle

Write short note on optical fiber cables and compare step index fibers with graded 07 **(b)** index fibers.

Total Marks: 70

Date: 31/12/2012

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