

GUJARAT TECHNOLOGICAL UNIVERSITY
B E Sem-VI Examination May 2011

Subject code: 160802

Subject Name: Electronic Communication

Date: 17/05/2011

Time: 10.30 am – 01.00 pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) With neat schematic diagram explain the operation of the basic communication system. **07**
- (b) Explain briefly what is meant by skin effect and why it is undesirable. What steps must be taken to reduce skin effect in inductors? **07**
- Q.2** (a) Explain (with neat diagram) equivalent input noise generators and comparison of BJTs and FETs. **07**
- (b) The frequency span to be received by a receiver is from 525KHz to 1650KHz. If C_{min} of tuning circuit is limited to 50pF by a trimmer of 25pF, calculate the value of padder capacitor, if the maximum value of the variable capacitor is 450pF. The IF used is 465KHz. **07**

OR

- (b) A mixer stage has a noise figure of 20dB, and this is preceded by an amplifier that has a noise figure of 9dB and an available power gain of 15dB. Calculate the overall noise figure referred to the input. **07**
- Q.3** (a) State and prove following properties of Fourier Transform **07**
1. Time Shifting 2. Frequency Shifting 3. Convolution in time domain.
- (b) Find the Fourier transform of the periodic signal: $x(t) = \cos(2\pi f_0 t) \cdot u(t)$ **07**

OR

- Q.3** (a) State and prove the following properties of Fourier Transform: **07**
1. Scaling 2. Differentiation in time domain
Also explain the significance of these properties in communication systems.
- (b) Explain with block diagram frequency multiplier using PLL and Frequency Synthesizer using PLL. **07**
- Q.4** (a) Sketch the waveforms for : **07**
1. AM wave 2. DSB-SC wave 3. SSB-SC wave
Compare DSB and VSB techniques.
- (b) A coil has a series resistance of 5 ohm, a self capacitance of 7pF, and an inductor of 1 micro Henry. Determine the effective inductance and effective Q-factor when the coil forms part of a series tuned circuit resonant at 25 MHz. **07**

OR

- Q.4** (a) Explain waveforms at various points of a super heterodyne Receiver. **07**
(b) Explain generation of AM(amplitude modulation) wave using nonlinear property(with neat sketch) **07**
- Q.5** (a) State and explain Kepler's law in relation to artificial satellites orbiting the earth. Explain what is meant by the geostationary orbit and why there is only one such orbit. **07**
(b) Noise immunity of digital messages is better than that of analog messages. Justify **07**
.Explain:Bandpass limiter

OR

- Q.5** (a) Explain block diagram of double conversion used in communication receivers. **07**
(b) Explain capacitive tap with circuit diagram and find transfer impedance. Explain what is meant by polar mount antenna. **07**
