



PBB-003-1273002 Seat No. _____

M. Sc. (ECI) (Sem. III) (CBCS) Examination

November / December - 2018

Fundamental of Communication Electronics :
Paper - 10
(New Course)

Faculty Code : 003

Subject Code : 1273002

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) Figures on right hand side indicate marks.
(2) Assume suitable data if necessary.

1 Answer the following : (Any Seven) 14

- (1) Draw block diagram for an analog electronic communication system.
- (2) Define SNR, Noise Factor & Noise Figure.
- (3) Define Image Frequency, Image Frequency Rejection Ratio (IFRR).
- (4) Define : Periodic and Aperiodic wave. Draw its waveform.
- (5) Draw output spectrum of AM SSBFC, AM SSBSC, AM VSB.
- (6) What is Coefficient of Modulation and Percent Modulation?
- (7) Define : Fidelity and Selectivity.
- (8) Explain four requirements for a feedback oscillator to work.
- (9) Write the difference between FM & PM.
- (10) What is piezoelectric effect?

- 2** Answer the following : (Any Two)
- (1) Explain LC Tank Circuit. Design and explain Colpitts oscillator using LC tank circuit. **7**
 - (2) For an AM DSBFC wave with a peak unmodulated carrier voltage $V_c = 10 V_p$, a load resistance $R_L = 10\Omega$, and a modulation coefficient $m = 1$, determine **7**
 - (a) Powers of the carrier and upper and lower sidebands
 - (b) Total sideband power
 - (c) Total power of the modulated wave
 - (d) Draw the power spectrum
 - (3) Explain AM Detector with its circuit and waveform. **7**

3 Answer the following :

- (1) What is frequency synthesizer? Explain any one technique of Direct Frequency Synthesizers. **7**
- (2) Write a short note on Quadrature Amplitude Modulation (QAM). **7**

OR

3 Answer the following :

- (1) Explain Balanced Slope Detector with its circuit and response graph. **7**
- (2) What is superheterodyne? Explain with block diagram AM Superheterodyne Receiver. **7**

4 Answer the following :

- (1) Derive equation for voltage and power for Amplitude Modulation. **7**
- (2) What is PLL? Draw and explain its block diagram. **7**

5 Answer the following : (Any Two)

(1) Write a short note on Wein Bridge Oscillator. 7

(2) Explain the process of frequency conversion in AM receiver with diagram. 7

(3) For a non-ideal amplifier and the following parameters, determine 7

(a) Input SNR (dB)

(b) Output SNR (dB)

(c) Noise Factor and Noise Figure

Input signal power = 2×10^{-10} W, Input noise power = 2×10^{-18} W, Power gain = 1,000,000 and Internal Noise (N_d) = 6×10^{-12} W

(4) Write a short note on Crosby Direct FM Transmitter. 7
