

B.T.E.C.H.
(SEM V) THEORY EXAMINATION 2018-19

Principle of Communication

Time: 3 Hours

Total Marks: 70

Note: 1. Attempt all Sections. If require any missing data, then choose suitably.

SECTION A

2 x 7 = 14

1. Attempt all questions in brief.
- What frequencies are used in microwave communication?
 - Show the effect of phase error in coherent detection of DSB SC signal.
 - What do you mean by modulation index?
 - What is a stereophonic sound?
 - Explain pulse amplitude modulation in short.
 - What are the issues in digital transmission?
 - Explain the improvement for SNR in frequency modulation.

SECTION B

7 x 3 = 21

2. Attempt any three of the following:
- What is DSB SC modulation? Explain DSB SC modulator.
 - What do you mean by phase modulation and frequency modulation? Derive the relation between them.
 - Explain a PCM communication system using block diagram. What is companding?
 - Explain adaptive delta modulation with the help of block diagram in brief.
 - Calculate the signal to noise ratio in frequency modulation and derive the relation for output noise power.

SECTION C

7 x 1 = 7

3. Attempt any one part of the following:
- Explain different methods of generating a single sideband signal.
 - With the help of block diagram explain radio transmitter and receiver.
4. Attempt any one part of the following:
- Give a generalized representation of bandwidth for single tone sinusoidal modulating signal of amplitude A_m frequency $\omega_m (-2\pi f_m)$, carrier amplitude A_c , frequency $\omega_c (=2\pi f_c)$, for both PM and FM. Assume proportionality constant for phase modulation k_p and for frequency modulation k_f .
 - Explain any two methods of FM generation.
5. Attempt any one part of the following:
- Explain the concept of Time Division Multiplexing (TDM) and Frequency Division multiplexing (FDM) using Pulse Amplitude Modulation.
 - Explain PWM generation and PPM generation from PWM and their principle of generation.
6. Attempt any one part of the following:
- Explain the basic principle of differential PCM. What is the need for predictor in differential PCM
 - Explain frequency domain representation of noise and the effect of filtering on probability density of Gaussian Noise.
7. Attempt any one part of the following:
- Explain Pre-emphasis and De-emphasis in a FM system.
 - Give the block diagram representation of a PLL and analyze the output voltage, operating range and bandwidth of the PLL.