DipIETE – ET (OLD SCHEME)

Code: DE12 **Subject: COMMUNICATION ENGINEERING**
Time: 3 Hours **Max. Marks: 100**

JUNE 2009

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q. 1. must be written in the space provided for it in the answer book supplied and nowhere else.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2x10)

a. The value of the resistor creating thermal noise is doubled, the noise power generated therefore is

(A) halved. **(B)** quadrupled.
(C) doubled. **(D)** unchanged.

b. The most commonly used filter in SSB generation are

(A) Mechanical. **(B)** RC.
(C) LC. **(D)** Low Pass.

c. As electromagnetic waves travel in free space, only one of the following can happen to them

(A) absorption. **(B)** attenuation.
(C) refraction. **(D)** reflection.

d. Which of the following is a non-resonant antenna:

(A) The Rhombic antenna **(B)** The Folded Dipole
(C) The end-fire array **(D)** The broadside array

e. Which of the following system is digital

(A) PPM **(B)** PWM
(C) PCM **(D)** All of them

f. Quantization noise occurs in

(A) TDM **(B)** FDM
(C) PCM **(D)** PWM

g. The signals sent by the TV transmitter to ensure correct scanning in the receiver are called

(A) Sync. **(B)** Chroma.
(C) Luminance. **(D)** Video.

h. Which of the following is true

(A) FM is more immune to noise compared to AM.
(B) AM requires more BW than FM.

(C) AM is more immune to noise than FM.
(D) All are true.

i. Top loading is sometimes used with antenna in order to increase its

(A) effective height. **(B)** bandwidth.
(C) beamwidth. **(D)** input capacitance.

j. According to sampling theorem for low pass signals, the sampling frequency should be

(A) equal to signal frequency.
(B) less than signal frequency.
(C) more than double the signal frequency.
(D) all is applicable.

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. What is the need of modulation? Explain. **(4)**

b. The noise output of a resistor is Amplified by a noiseless amplifier having a gain of 60 and a bandwidth of 20 kHz. A meter connected to the output of the amplifier reads 1 mV rms. The bandwidth of the amplifier is reduced to 5 kHz, its gain remaining constant. What does the meter read now? **(6)**

c. What is noise figure? Derive the formula for noise figure of an amplifier circuit. **(6)**

Q.3 a. Draw the frequency spectrum of AM wave. Deriving formula, explain the importance of the depth of modulation m (modulation index). **(8)**

b. What are DSB-SC and SSB signals? Give their advantages over DSB-AM. **(8)**

Q.4 a. Explain the phase shift method of SSB generation. **(8)**

b. What are PLL circuits? Explain with Diagram the working of a VCO. **(8)**

Q.5 a. What is the need of Pre-emphasis and De-emphasis circuits? Explain the working of these circuits. **(8)**

b. Explain any one method of generation of FM wave. **(8)**

Q.6 a. What is PCM? Explain the generation and detection of PCM. Also give its applications. **(12)**

b. Describe the Dispersion Phenomenon in optical fiber. **(4)**

Q.7 a. Give the fundamentals and applications of cavity resonators. **(8)**

b. Define the following terms related to wave propogation

(i) Polarization. (ii) Attenuation.
(iii) Absorption. (iv) Reflection.
(v) Refraction. (vi) Diffraction.
(vii) Ducting. (viii) Fading. **(8)**

Q.8 a. Explain the structure and properties of Rhombic and Horn Antenna. **(8)**

b. Why blanking and synchronizing pulses are required in TV circuits? Explain. **(8)**

Q.9 Write short notes on any **TWO** of the following:-

(i) Error detection and correction codes.
(ii) Folded Dipole.
(iii) Time Division Multiplexing. **(8 × 2 = 16)**