Code: AE65 Subject: **ANALOG COMMUNICATION**

AMIETE – ET

Time: 3 Hours   **JUNE 2013**   Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

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.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.**
- **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:**   (2×10)

   a. Which of the following is not a major communication medium?

     (A) Free space   **(B)** Water
     (C) Wires   **(D)** Fiber optic cable

   b. The communications medium causes the signal to be:

     (A) Amplified   **(B)** Modulated
     (C) Attenuated   **(D)** Interfered with

   c. Radio signals are made up of:

     (A) Voltages and Currents   **(B)** Electric and magnetic fields
     (C) Electrons and protons   **(D)** Noise and data

   d. In a low level modulation system, the amplifier following the modulated stage should be:

     (A) Only linear amplifier   **(B)** Only harmonic generator
     (C) Only class A amplifier   **(D)** None of these

   e. In commercial FM broadcasting, the maximum frequency deviation is normally:

     (A) 5 KHz   **(B)** 15 KHz
     (C) 75 KHz   **(D)** 200 KHz

   f. In angle modulation, the information signal modify the:

     (A) Phase angle   **(B)** Frequency
     (C) Amplitude of the carrier   **(D)** All of these

---

g. A PWM signal can be generated by:

(A) Monostable multivibrator   (B) Astable multivibrator
(C) Integrating the PPM signal   (D) Differentiating the PPM signal

h. In PCM system, output S/N increases:

(A) Linearly with bandwidth   (B) Exponentially with bandwidth
(C) Inversely with bandwidth   (D) None of these

i. A superheterodyne receiver with an I.F. of 450 KHz is tuned to a signal at 1200 KHz. The image frequency is:

(A) 750 KHz   (B) 900 KHz
(C) 1650 KHz   (D) 2100 KHz

j. In the generation of modulated signal, a varactor diode can be used for:

(A) FM generation only   (B) AM generation only
(C) PM generation only   (D) Both AM and PM generations

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

Q.2 a. What do you understand by amplitude modulation? Show that the AM output contains two sidebands and the carrier frequency.   **(8)**

b. Show that the equivalent parallel impedance of a tuned circuit is its equivalent resistance for noise.   **(8)**

Q.3 a. The antenna current of an AM broadcast transmitter, modulated to depth of 40% by an audio sine wave is 11 amp. It increases to 12 amp as a result of simultaneous modulation by another audio sine wave. What is the modulation index due to this second wave.   **(6)**

b. Draw the block diagram of phase cancellation SSB generator and explain how the carrier and unwanted sideband are suppressed. What change is necessary to suppress the other sideband?   **(10)**

Q.4 a. Explain Co-channel and Adjacent channel interference in radio receivers. Also compare wideband and narrow band FM.   **(8)**

b. Explain Armstrong frequency modulation system with block diagram.   **(8)**

Q.5　a.　Define and explain the meaning of standing wave ratio. What is the formula it, if the load is purely resistive? Why is a high value of SWR often undesirable. **(8)**

　　　b.　Explain how the constant intermediate frequency is achieved in the superhetrodyne receiver and also explain the term sensitivity, selectivity and image frequency. **(8)**

Q.6　a.　Calculate the ratio of cross section of a circular waveguide to that of a rectangular one, if each is to have same cut off wavelength for its dominant mode. **(8)**

　　　b.　Compare waveguide and transmission line from the point of view of frequency limitation, attenuation, spurious radiation and power handling capacity. **(8)**

Q.7　a.　What are the typical frequencies, bandwidths and repeater gains and spacings in a coaxial cable system? **(8)**

　　　b.　How do the three major types of INTELSAT satellite earth stations differ from each other, in general appearance and applications? **(8)**

Q.8　a.　What do you mean by PCM. Explain its transmitter and receiver with help of block diagram. **(8)**

　　　b.　What is telegraphy? Describe briefly the system and machines used for transmitting and receiving it. **(8)**

Q.9　Write short note on any **TWO**:　　　　　　　　　　　　**(8×2=16)**
　　　(i)　Reactance Properties of transmission lines.
　　　(ii)　Detection and AGC.
　　　(iii)　Noise Figure Measurement.