No. of Printed Pages : 4

BICS-034

DIPLOMA – VIEP – COMPUTER SCIENCE AND ENGINEERING (DCSVI)

00295

Term-End Examination

December, 2014

BICS-034 : PRINCIPLES OF COMMUNICATION ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any **five** questions in all. Question no. **1** is **compulsory**. All questions carry equal marks.*

1. Choose the correct answer : *7×2=14*

(a) In a communication system, noise is most likely to affect the signal

(i) at the transmitter

(ii) in the channel

(iii) in the information source

(iv) at the destination

(b) Amplitude modulation is a process of

(i) superimposing a low frequency on a high frequency

(ii) superimposing a high frequency on a low frequency

(iii) carrier interruption

(iv) frequency shift and phase shift

(c) In a low-level AM system, amplifiers following modulated stage must be

(i) linear devices

(ii) harmonic devices

(iii) class C amplifiers

(iv) non-linear devices

(d) The controlled oscillator synthesizer is sometimes preferred over the direct one because

(i) it is a simpler piece of equipment

(ii) its frequency stability is better

(iii) it does not require crystal oscillators

(iv) it is relatively free of spurious frequencies

(e) Which of the following antennas is best excited from a waveguide ?

(i) Biconical

(ii) Horn

(iii) Helical

(iv) Discone

(f) One of the following is an indirect way of generating FM. It is the

(i) Reactance FET modulator

(ii) Varactor diode modulator

(iii) Armstrong modulator

(iv) Reactance bipolar transistor modulator

(g) To couple a coaxial line to a parallel-write line, it is best to use

(i) Slotted line

(ii) Balun

(iii) Directional coupler

(iv) Quarter-wave transformer

2. (a) List the basic functions of a radio transmitter and the corresponding functions of the radio receiver. *7*

(b) Define amplitude modulation and modulation index. Use a sketch of a sinusoidally modulated AM waveform to help explain the definition. *7*

3. (a) Define and explain field intensity. Relate it to power density with the concept of characteristic impendance of free space. *7*

(b) What is meant by the diffraction of radio waves ? Under what conditions does it arise ? Under what conditions does it not arise ? *7*

4. Compare and contrast the performance and applications of the various types of frequency demodulators. *14*

5. (a) What factors govern the selection of the feed point of a dipole antenna ? How do current feed and voltage feed differ ? *7*

(b) Describe the end-fire array and its radiation pattern and explain how the pattern can be made unidirectional. *7*

6. How many different types of transmission lines are there ? In what ways do their applications differ ? What is it that limits the maximum power that they can handle ? *14*

7. (a) What is the basic limitation of modulated transistor amplifiers ? When are they used ? Are there any circuits which are similar to comparable tube circuits ? *7*

   (b) Why are two different types of bandwidths used in frequency-modulated transmissions ? Explain. *7*

8. (a) With the aid of the block diagram of a simple receiver, explain the basic superheterodyne principle. *7*

   (b) Write short notes on any ***two*** of the following : $2 \times 3\frac{1}{2} = 7$

   (i) Application of Loop Antenna
   (ii) Transverse Electromagnetic Wave
   (iii) Critical Frequency