| BICS-034 |

DIPLOMA VIEP COMPUTER SCIENCE AND ENGINEERING

Term-End Examination

December, 2013

BICS-034 : PRINCIPLES OF COMMUNICATION ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : (i) Attempt **any five** questions.

(ii) Question **No. 1** is **compulsory**.

(iii) **All** questions carry **equal** marks.

1. Choose the correct answer.
   (a) The Bandwidth of the FM is   2
       (i) $2(\delta + fm)$
       (ii) $(\delta + fm)$
       (iii) 2fm
       (iv) None of the above
   (b) In a radio receiver with simple AGC   2
       (i)   An increase in signal strength produces more AGC.
       (ii) The highest AGC signal strength produces more AGC.
       (iii) The faster the AGC time constant, the more accurate the output.
       (iv) The audio stage gain is normally controlled by the AGC.
   (c) In TV transmission the modulation schemes   2
       for Video and Audio are, respectively
       (i)   FM and AM
       (ii) FM and FM
       (iii) AM and FM
       (iv) AM and AM

(d) The troposcatter phenomenon is used with the frequencies in the　　2

(i) HF range

(ii) VHF range

(iii) UHF range

(iv) None of these

(e) A transmission line has a VSWR of 2, the reflection co-efficient is　　2

(i) 1/3

(ii) 0

(iii) 1/4

(iv) 1/2

(f) For transmission line-load matching over a range of frequencies, it is best to use a　　2

(i) Balun transformer

(ii) Single stub of adjustable position.

(iii) Double stub.

(iv) Broadband directional coupler.

(g) Need for communication　　2

(i) Multiplexing

(ii) To reduce the height of the antenna

(iii) both (i) and (ii)

(iv) only (i)

2. (a) A standard AM broadcast station is allowed to transmit modulating frequencies up to 5kHZ. If the AM station is transmitting on a frequency of 980kHz, compute the maximum and minimum upper and lower sidebands and the total bandwidth occupied by the AM station.　　4

(b) Draw the block diagram of communication system and explain it.　　7

(c) Discuss types of electronic communications.　　3

3. Define the following terms : 7x2=14
   (a) Modulation index in AM
   (b) Deviation ratio
   (c) Sensitivity
   (d) Fidelity
   (e) Polarization
   (f) Directivity
   (g) Beam width

4. (a) The terminating load of UHF transmission 7
       line with characteristic impedance
       $Z_0 = 50\Omega$, working at 300MHz is $50 + j50\Omega$.
       Calculate the VSWR and reflection
       coefficient.
   (b) What is impedance matching? Explain the 7
       various methods of achieving impedance
       matching.

5. (a) Compare the characteristics of a half wave 7
       folded dipole and a three element yagi
       antenna.
   (b) What functions are performed by an 7
       antenna ? What do you understand by
       antenna reciprocity ?

6. (a) Describe briefly "Duct Propagation". 7
   (b) What are ground wave propagation ? 7
       Explain the term critical frequency and skip
       distance.

7. (a) What is the critical frequency for reflection 4
       at vertical incidence if the maximum
       electron density is $10^6/cm^3$?
   (b) With the help of a block diagram explain 7
       the super hetrodyne receiver.
   (c) A 5kHZ sine wave is used to frequency 3
       modulate a carrier (Narrow Band FM).
       What is the bandwidth required ?

8. Write short notes on **any four** of the following :

    (a)   Pre-emphasis and de-emphasis.   **4x3.5=14**

    (b)   Simplex and Duplex.

    (c)   FM transmitter.

    (d)   Need of AGC.

    (e)   Stub matching.

    (f)   Sky wave propagation.

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