No. of Printed Pages : 4

BIEL-032

DIPLOMA – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (DECVI)

Term-End Examination

00055

June, 2014

BIEL-032 : PRINCIPLES OF COMMUNICATION ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. Question no. 1 is compulsory.*

1. (a) The envelope of an AM wave is 2

(i) $A + x(t)$

(ii) $[A + x(t)] \cos \omega t$

(iii) $\cos \omega_c t$

(iv) None

(b) The intrinsic impedance of the free space is 2

(i) 75 Ω

(ii) 73 Ω

(iii) 120 Ω

(iv) 377 Ω

(c) MUF is given by 2

(i) $f_c \cos \theta$

(ii) $f_c \sec \theta$

(iii) $f_c \tan \theta$

(iv) $f_c \cot \theta$

(d) AM is used for broadcasting because 2

(i) it is more noise immune than other systems.

(ii) compared with other systems it requires less transmitting power.

(iii) of less receiver complexity.

(iv) it requires less bandwidth than any other system.

(e) The BW required for narrow band FM is approximately 2

(i) f_m

(ii) $2 f_m$

(iii) $(m_f + 1) f_m$

(iv) $m_f f_m$

(f) Ionospheric propagation falls beyond the operating frequency of 2

(i) 30 kHz

(ii) 300 kHz

(iii) 3000 kHz

(iv) 30,000 kHz

(g) The communication medium causes the signals to be 2

(i) amplified

(ii) modulated

(iii) attenuated

(iv) interfered with

2. (a) Explain the radio frequency spectrum used in communication system. 6

(b) Draw the block diagram of a communication system and explain the function of each block. 8

3. (a) Find the percent modulation of an AM wave whose total power content is 2500 W and whose sidebands each contain 400 W. 7

(b) Explain the generation of FM wave using Armstrong method. 7

4. (a) State the principle of Heterodyne Receiver. 4

(b) Define Sensitivity, Selectivity and Fidelity. 6

(c) Write the main functions of a radio receiver. 4

5. (a) Define characteristic impedance of a transmission line. What would be the input impedance of a finite length of a given line if it was terminated in its characteristic impedance ? Justify your answer. 7

(b) Explain briefly about single and double stub matching. 7

6. (a) Briefly describe the following antenna parameters : 6

(i) Directivity

(ii) Polarisation

(b) Draw the radiation pattern and mention the applications of the following antennas : 8

(i) Loop antenna

(ii) Horn antenna

7. (a) Two points on Earth are 1500 km apart, and are communicating by means of HF for a single hop transmission, the critical frequency is 7 MHz and conditions are idealized. Calculate the MUF for those two points if the height of the ionosphere layer is 300 km. 6

(b) Describe briefly the Duct propagation and Troposphere Scatter propagation. 8

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

$4 \times 3\frac{1}{2} = 14$

(a) Sky wave propagation

(b) Folded dipole antenna

(c) Equivalent circuit of transmission line

(d) PLL

(e) Need for modulation