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BIEL-032

DIPLOMA – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (DECVI)

Term-End Examination

December, 2015

BIEL-032 : PRINCIPLES OF COMMUNICATION ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt any* ***five*** *questions. Question no.* ***1*** *is* ***compulsory****. Use of scientific calculator is permitted.*

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

(a) The purpose of a radio transmitter is to generate,

(i) modulate, and radiate a radio frequency (RF) signal.

(ii) demodulate, and radiate a radio frequency (RF) signal.

(iii) modulate, and collect a radio frequency (RF) signal.

(iv) modulate, and amplify a radio frequency (RF) signal.

(b) Signal path between the transmitter and receiver in sky wave propagation is provided by

(i) troposphere

(ii) ionosphere

(iii) atmosphere

(iv) stratosphere

(c) The reflection coefficient of a line is -1. The line is

(i) open-circuited

(ii) short-circuited

(iii) terminated by Z_0

(iv) of infinite length

(d) One of the following converts sound waves into AF signals :

(i) Loud speaker

(ii) Rectifier

(iii) Microphone

(iv) Antenna

(e) The process of mixing AF signal and RF wave is known as

(i) modulation

(ii) demodulation

(iii) oscillation

(iv) amplification

(f) In a Superheterodyne Receiver the frequency of input fed to the amplifier circuit is

(i) 600 kHz

(ii) 445 kHz

(iii) 455 kHz

(iv) 1055 kHz

(g) Which factor determines the polarisation of a radiated wave ?

(i) The frequency of the transmitted wave

(ii) The impedance match of the transmission line

(iii) The direction of the electric field lines of force

(iv) The direction of the receiving antenna

2. (a) Why do we go for modulation ? Define modulation index for amplitude modulation. *7*

(b) Define heterodyning. Distinguish between Narrow band FM and Wide band FM. *7*

3. Explain the principle of operation of FM Receivers. *14*

4. Derive the relationship between radiation resistance, directivity and effective aperture for a half-wave dipole. *14*

5. (a) What are the difficulties in single stub matching? 7

(b) What is Standing-Wave Ratio (SWR) ? Derive the relation between SWR and Reflection Coefficient. 7

6. (a) Characteristic impedance of a transmission line is 50 Ω. Input impedance of the open-circuited line is Z_{oc} = 100 + j150 Ω. When the transmission line is short-circuited, find the value of the input impedance. 7

(b) Draw the radiation pattern of a half-wave dipole antenna and a folded dipole antenna. 7

7. Write short notes on any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

(a) PLL

(b) Telescopic Antenna

(c) Pre-emphasis and De-emphasis

(d) Balun

(e) Polarization