Code: DE12 **Subject: COMMUNICATION ENGINEERING**
Time: 3 Hours **Max. Marks: 100**

JUNE 2011

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. The modulation index of an AM wave is changed from 0 to 1. The transmitted power is _____

(A) unchanged. **(B)** halved.
(C) Doubled. **(D)** increased by 50 percent.

b. Indicate which one of the following is not an advantage of FM over AM

(A) better noise immunity is provided.
(B) lower bandwidth is required.
(C) the transmitter power is more useful.
(D) less modulating power is required.

c. An antenna that is circularly polarized is _____

(A) Helical. **(B)** Small circular loop.
(C) Parabolic reflector. **(D)** Yagi-Uda.

d. The wavelength of a wave in a waveguide _____

(A) is greater than in free space.
(B) depends only on the waveguide dimensions and the free space wavelength.
(C) is inversely proportional to the phase velocity.
(D) is directly proportional to the group velocity.

e. The biggest disadvantage of PCM is _____.

(A) its inability to handle analog signals.
(B) high error rate which its quantizing noise introduces.
(C) its incompatibility with TDM.
(D) the large bandwidth that is required for it.

f. The signals sent by the TV transmitter to ensure correct scanning in the receiver are called _____

(A) Sync. **(B)** Chroma.
(C) Luminance. **(D)** Video.

g. Losses in optical fibers are not caused by _____

(A) Impurities. **(B)** micro bending.
(C) attenuation in the glass. **(D)** stepped index operation.

h. A geostationary satellite _____

(A) is motionless in space.
(B) is not really stationary at all, but orbits the earth within a 24 hour period.
(C) appears stationary over the earth's magnetic pole.
(D) is located at a height of 35800 KM to ensure global coverage.

i. Which of the following is an application of PLL _____

(A) Voltage regulation. **(B)** FM modulation.
(C) FM demodulation. **(D)** AM modulation.

j. The Noise Figure of a receiver connected to an antenna whose resistance is 50 ohm and has an equivalent noise resistance of 30 ohm is _____

(A) 5.36 dB **(B)** 1.65 dB
(C) 3.44 dB **(D)** 2.04 dB

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

Q.2 a. Draw the block diagram of a communication system and explain, the function of each block. **(8)**

b. Explain the terms related to noise:
(i) Thermal noise.
(ii) Shot noise.
(iii) Transit noise. **(8)**

Q.3 a. Explain the suppression of unwanted sidebands using Filter method. **(8)**

b. Draw the block diagram of an AM superhetrodyne receiver and explain its operation with the help of waveforms at different stages. **(8)**

Q.4 a. Draw the circuit diagram of a Ratio Detector and explain its principle of operation. **(8)**

b. Explain Pre-emphasis and De-emphasis as used in FM system. **(8)**

Q.5 a. Explain the function of (i) Phase Comparator and (ii) VCO of a PLL system. **(8)**

b. State Sampling Theorem and explain Pulse Amplitude Modulation (PAM). **(8)**

Q.6 a. What do you mean by Sky wave Propagation? What are the different layers formed in Sky Wave Propagation and explain each layers in brief. **(8)**

b. Explain the following terms with respect to antenna:
(i) radiation resistance (ii) bandwidth (iii) beam width and (iv) polarization **(8)**

Q.7 a. List out the various error detection and correction techniques used in data communication and explain any one of them clearly with suitable examples. **(8)**

b. Explain interlaced scanning used in television system. **(8)**

Q.8 a. What is a waveguide and explain various modes of transmission modes in a Waveguide. **(6)**

b. What is characteristic impedance of a transmission line and explain the Primary and Secondary constants of a transmission line. **(5)**

c. List out the advantages of optical fibers over coaxial cables. **(5)**

Q.9 Write short notes on any **TWO** of the following: **(2×8)**

(i) Frequency Division Multiplexing (FDM)
(ii) Pulse Code Modulation (PCM)
(iii) Block diagram of Monochrome TV receiver