Code: D - 12   **Subject: COMMUNICATION ENGINEERING**

December 2005

Time: 3 Hours

Max. Marks: 100

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.**
- **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 best alternative in the following:**   **(2x10)**

a.   Maximum undistorted power output of transmitter is obtained when its modulation is

   (A) 50%.   **(B)** 100%.
   (C) More than 100%.   **(D)** 75%.

b.   In a communication system, noise is produced mostly

   (A) at the transmitter.   **(B)** in channel.
   (C) at receiver.   **(D)** both **(B)** & **(C)**.

c.   Thermal noise is proportional to

   (A) $(T)^{1/2}$.   **(B)** T.
   (C) $3\,T$.   **(D)** $(T)^{-1/2}$.

d.   The modulation index of an AM signal is decreased from 1 to 0. The carrier power.

   (A) remains unchanged.   **(B)** gets doubled.
   (C) increased by 50%.   **(D)** gets quadrupled.

e.   The S/N ratio in a PCM system depends on

   (A) sampling rate.   **(B)** number of quantization levels.
   (C) signal bandwidth.   **(D)** None of these.

f.   Antenna used for microwave links are

   (A) Loop antenna.   **(B)** Log periodic antenna.
   (C) Parabolic antenna.   **(D)** Rhombic antenna.

g. Sync pulses are transmitted during

   (A) Horizontal scanning retrace time.
   (B) Vertical scanning retrace time.
   (C) Both horizontal and vertical retrace time.
   (D) Once in full frame time.

h. A pre-emphasis circuit is used to

   (A) boost the bass frequencies.
   (B) boost whole audio band.
   (C) amplify higher audio frequencies.
   (D) converting PM to FM.

i. The geostationary satellite is above earth at a height of about

   (A) 9000 km.   **(B)** 19000 Km.
   (C) 36000 km.   **(D)** None of the above.

j. Wave guides are not used for frequencies

   (A) Below 500 MHz.   **(B)** Above 1 GHz.
   (C) Above 10 GHz.   **(D)** None of the above.

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

Q.2   a. What is modulation and explain the need for modulation?   **(8)**

     b. Explain following terms:

        (i)   S/N ratio.
        (ii)   Noise factor and noise figure.   **(8)**

Q.3   a. Derive the relationship for output power of an AM transmitter and depth of modulation.   **(8)**

     b. Draw and explain by suitable block diagram the working of a super heterodyne receiver.   **(8)**

Q.4   a. State the advantages of SSB transmission over the DSB transmission.   **(8)**

     b. Explain the working of a Ratio detector using circuit diagram.   **(8)**

Q.5   a.   What is pulse modulation? Explain Pulse Amplitude Modulation (PAM) in detail.   **(8)**

       b.   Explain how do we achieve FM detection using PLL.   **(8)**

Q.6   a.   What are the advantages and limitations of optical fibres in communication?   **(8)**

       b.   What are different modes of transmission in an Optical Fibre Communication?   **(8)**

Q.7   a.   Describe the operation of a Rhombic antenna.   **(8)**

       b.   Describe in detail the ground wave propagation and state its advantages and disadvantages.   **(8)**

Q.8   a.   Draw a block diagram of Monochrome TV Receiver and briefly explain its different sections.   **(8)**

       b.   Draw and explain by a block diagram the operation of a satellite communication system. What are its advantages and disadvantages over terrestrial communication system?
       (8)

Q.9   Write short notes on any **TWO** of the following:

         (i)   PCM
         (ii)   Pre-emphasis and De-emphasis
         (iii)   Quadrature detector   **(2 x 8)**