Total No. of printed pages = 3

Et-605/MCS/6th Sem/2017/M

MODERN COMMUNICATION SYSTEMS

Full Marks – 70

Pass Marks – 28

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) Derive the relation between transmitter and receiver power in the free space. Show that the received power is inversly proportional to the square of distance. 7

   (b) Briefly describe the functional characteristics of an up link, a transponder and a downlink model for a satellite system. 7

2. (a) Define the following terms : 3×2=6

   (i) Inclination angle of a satellite

   (ii) Geosynchronous orbit of a satellite.

   (b) Name the different types of antennas used in satellite communication. Mention their properties and ease of applicability. 8

[Turn over

3. (a) Define information. How it is measured ?

2+2=4

(b) A source emits eight different symbols with their corresponding probabilities as shown in the table. Use Shanon-Fano coding technique to encode each symbol. Compare average length of the code with entropy of that source.

Symbol (Sk)	Probability P(Sk)	Symbol (Sk)	Probability P(Sk)
S_0	·5	S_4	·05
S_1	·25	S_5	·025
S_2	·01	S_6	·0125
S_3	·05	S_7	·0125

2+2+6=10

4. Why encryption is required for an information ? Define plain text and cipher text. Mention any three cipher and describe each of them.

2+2+2+8=14

5. (a) State the difference between circuit switching and packet switching techniques. 4

(b) Name the different types of packet switching techniques. Compare the operation of a Virtual Circuit Network with Datagram Network. 2+8=10

6. (a) What are the principal differences between GSM and CDMA technologies ? 5

(b) Draw a neat diagram of GSM architecture and describe the functions of different sections and sub-sections. 9

7. Write short notes on any *two* : 7×2=14

(a) ISDN

(b) Kepler's law

(c) VPN

(d) IPV4.