Total No. of printed pages = 7

**END SEMESTER EXAMINATION – 2020**

Subject Code : ET-605

**MODERN COMMUNICATION SYSTEM**

Full Marks – 70

Time – Three hours

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

**Instructions :**

1. Answer Q.No.-1 from PART–A.
2. Answer any *five* questions from PART–B.

PART – A

Marks – 25

1. Answer *all* questions :

(A) Choose the correct option/fill in the blanks :

(a) Which of the frequency band is not used in satellite communication ? 1

(i) HF band (30-300 MHz)

(ii) L band (1-2 GHz)

(iii) Ku band (12-18 GHz)

(iv) Ka band (26-40 GHz)



[Turn over

(b) The laws which explain the satellite motion in orbit are known as _____. 1

(c) The maximum amount of mutual information between a pair of message is known as 1

(i) Probability

(ii) Possibility

(iii) Mutual information

(iv) Entropy

(d) Entropy is a measure of _____. 1

(i) Uncertainty

(ii) Information

(iii) No. of beat or byte present in the data

(iv) None of the above

(e) Which is not a standard of MODEM ? 1

(i) V.22

(ii) V.34

(iii) V.42

(iv) V.89

(f) No. of keys in asymmetric key encryption is _____. 1

(i) One (ii) Two

(iii) Three (iv) No key is required

(g) The encrypted information is known as _____. 1

(h) Rotate 100101 two bits in the right _____. 1

(i) GPRS is an example of 1

(i) Circuit switch network

(ii) Packet switch network

(iii) Message switch network

(iv) Multiplexing and demultiplexing

(j) The term 'DATAGRAM' is related with 1

(i) Circuit switch network

(ii) Ordinary telephone

(iii) ISDN telephone

(iv) Packet switched network

B. State whether the statements are true or false :

(a) Full form of GSM is "Global Systems for Mobile communication". 1

(b) Base station is the last mile service provider in mobile telephony. 1

(c) The first generation cellular system is AMPS. 1

(d) Satellite follows four Keppler's law. 1

(e) A source has maximum entropy when all symbols emit with equal probabilities. 1

C. Answer *all* the questions :

(i) The orbital period of geosynchronous satellite is ____ hrs. ____ min. ____ sec. 2

(ii) ISDN D-channel data rates are 2

(a) 16 Kbps or 64 Kbps

(b) 64 Kbps

(c) 16 Kbps

(d) 2 Mbps

(iii) GSM uplink and downlink frequencies are _____ and _____ respectively. 2

(iv) Two modern round ciphers are _____ and _____. 2

(v) Two types of ISDN technologies are 2

(a) BRI/PRI

(b) GPRS/GSM

(c) 2G/3G

(d) GSM/CDMA.



PART–B

Marks – 45

2. Define following terms : (any *three*) 3×3

(a) Angle of Elevation

(b) Geosynchronous Orbit

(c) Keppler's Second law

(d) Attitude control.

3. (a) Define entropy. A source emits five different symbols with the probabilities $p_1 = .5$, $p_2 = .3$, $p_3 = .1$, $p_4 = .05$, $p_5 = .05$. Find out the entropy of the source. 2+4=6

(b) Define Hartley Shanon's Law with necessary mathematical insight. 3

4. (a) What are the key differences between symmetric key and asymmetric key cryptography ? 3

(b) Name three symmetric key cryptography and three asymmetric key cryptography techniques. 6

5. (a) Why switching is required in a network.

(b) Name the different types of switching techniques.

(c) Draw the timing diagram of a packet switched network and explain different stages. 2+2+5=9

6. Draw the block diagram of the ISDN network with all types of interfaces and explain briefly the functionalities of different blocks. 9

7. (a) Write the advantages and limitations of cellular communication.

(b) State the key differences between TDMA and FDMA and CDMA. 3+6=9

8. Draw neat sketch of a GSM architecture and describe the functions of the following subsystems : 4+2+2+1=9

(a) HLR

(b) VLR

(c) Base station.

9. Define the following terms. (any *two*) 4½×2=9

(a) Keppler's law

(b) Application of ISDN

(c) Probability of error.