

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

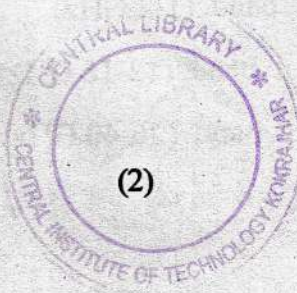
(ii) V.34

(iii) V.42

(iv) V.89

38/ET-605/MCS

(2)



(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

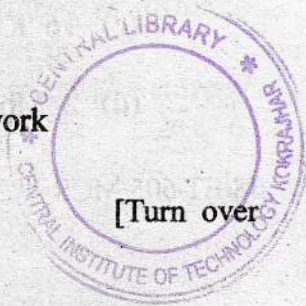
(j) The term 'DATAGRAM' is related with \_\_\_\_\_ 1

(i) Circuit switch network

(ii) Ordinary telephone

(iii) ISDN telephone

(iv) Packet switched network

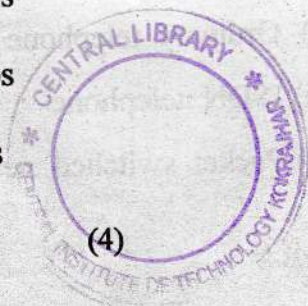


B. State whether the statements are true or false :

- (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 Kepler'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

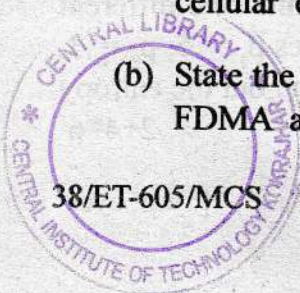


2. Define following terms : (any *three*) 3×3
- (a) Angle of Elevation
  - (b) Geosynchronous Orbit
  - (c) Kepler's Second law
  - (d) Attitude control.
3. (a) Define entropy. A source emits five different symbols with the probabilities  $p_1 = .5$ ,  $p_2 = .3$ ,  $p_3 = .1$ ,  $p_4 = .05$ ,  $p_5 = .05$ . 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

38/ET-605/MCS

(6)



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)  $4\frac{1}{2} \times 2 = 9$

- (a) Kepler's law
- (b) Application of ISDN
- (c) Probability of error.



These two factors of a 65M...  
...the function of the...  
...-2-1-1-0

(a) HIR

(b) VLR

(c) HIR

Define the following terms (a) (b) (c) (d) (e)

(a) Kepler's law

(b) Application of ISDN

(c) Probability of error

...to ...  
...the ...

...  
...