B.E. ELECTRICAL ENGINEERING (PART TIME) FOURTH YEAR SECOND SEMESTER (Old) – 2018

PRINCIPLES OF COMMUNICATION ENGINEERING AND COMPUTER NETWORKS

Full Marks 100

Time: Three hours

(50 marks for each part)

Use a separate Answer-Script for each part

No. of Questions

PART- I

Marks

Answer any **THREE** questions

Two marks reserved for neat and well organized answers

1. (a) Explain with the help of relevant mathematical derivations and sketches, the principle of "Double Side-Band Suppressed Carrier" (DSB-SC) amplitude modulation. Give spectral descriptions. Consider only multi-tone signals. — 8

(b) Derive the relation between the power contents of a conventional DSB- AM signal and the modulating message signal. — 8

2. (a) Discuss in brief, the principle of *"Single Balanced Series Bridge Diode Modulator"*. — 8

(b) With the help of relevant sketches and derivations, explain the frequency-discrimination method of generating SSB AM signals, with special reference to the use of Hilbert Transformer. — 8

3. (a) How can a narrowband angle modulated signal be generated? Explain.
How can a wideband FM signal be obtained from this narrowband signal? Elucidate. — 4+4

(b) Explain the process of *binary frequency shift-keying* (BFSK). How can the orthogonality of the carrier signals used in BFSK be ensured? Explain. What purpose does this orthogonality serve? — 8

4. (a) Discuss in details about "Binary Amplitude Shift Keying" (BASK). — 10

(b) Discuss in brief, the principle of time-division multiplexing for digital transmission of messages. — 6

[Turn over

No. of   **PART- I**   **Marks**
Question

5. Write short notes on *any two* of the following.

      a) Conventional DSB-AM switching modulator.

                                                             8+8

      b) Ring modulator for DSB-SC amplitude modulation.

      c) Advantages of digital communication systems over analog communication systems.

      d) Coherent demodulation of analog AM signals.

B.E. ELECTRICAL ENGINEERING (PART TIME) FOURTH YEAR SECOND SEMESTER SUPPLEMENTARY EXAM 2018 (Old)

Principles of Communication Engineering and Computer Networks

Time: Three Hours   Full Marks: 100

(50 marks for each part)
Use a separate Answer-Script for each Part

PART-II

Answer *any three* questions from this part.
Two marks are reserved for neat and well organised answer

1. a) How Checksum is used for detection of error in such system? Mention the drawback of parity in detecting error.   3+2

    b) A channel is required to carry a signal at 32mbps. The bandwidth of the channel is 4Mhz. What is the required signal-to-noise ratio of the channel in order to achieve this capacity.   3

    c) Explain the functions of physical layer, transport layer, and internet layer of TCP/IP protocol architecture.   8

2. a) What is LAN? What are the different topologies used in LAN?   6

    b) Why flow control is necessary in transmitting information from source to destination?   3

    c) Explain "Stop-and Wait" protocol and show how it can control the error in data transmission.   7

3. a) Explain circuit switching operation. Mention the limitations of circuit switching network. Give one example of circuit switched network.   3+2+1

    b) With neat sketches show the signals to be transmitted using i) RZ (Non-return-to zero) and ii) Differential Manchester encoding to transmit the binary data 110111010. Also mention the relative merits and demerits of the two methods.   6

    c) What are the different components of public switched telephone network (PSTN)?   2+2

[Turn over

Explain the function of **local loop** in this context.

4. Write short notes on any two: 8+8

i) Congestion control mechanisms ii) Routing in packet switched network

iii) Wired transmission medium for data transmission iv) Transmission impairments

5. Explain CSMA/CD protocol in LAN. What do you understand by FDDI LAN? Discuss the 7+3+6 functions of LAN bridge.