Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 20412

B.E/B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Fourth Semester

Electronics and Communication Engineering

EC 6402 — COMMUNICATION THEORY

(Regulations 2013)

(Also common to PTEC 6402 - Communication Theory for B.E (Part- time) Third Semester – Electronics and Communication Engineering -Regulations 2014)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. A carrier of 6 kV is amplitude modulated by an audio signal of 3 kV. Find the modulation index.

2. What are advantages of converting low frequency signal to high frequency signal?

3. Differentiate coherent and non coherent systems.

4. Draw the vector representation of an FM wave.

5. When is the random process called as deterministic?

6. Define heterodyning.

7. List the various types of internal noise.

8. What are the methods to improve FM threshold reduction?

9. A source generates three messages with probabilities 1/6, 1/3, 1/4. Calculate Entropy.

10. Define Mutual Information and Channel Capacity.

PART B — (5 × 13 = 65 marks)

11. (a) With the help of a neat diagram, explain the generation of DSBSC using balanced modulator. (13)

Or

(b) Explain the operation of super heterodyne receiver with a neat block diagram. (13)

12. (a) Draw the circuit diagram of a Foster Seeley discriminator and explain its working with relevant phasor diagram. (13)

Or

(b) Derive the expression for frequency spectrum of FM modulated signal and comment on the transmission bandwidth. (13)

13. (a) Explain the following terms : mean correlation, covariance and ergodicity. (13)

Or

(b) Derive the output expression of a linear time invariant filter. (13)

14. (a) Describe the various types of noises found in communication channel. (13)

Or

(b) Briefly, enumerate on narrow band noise and the properties of quadrature components of narrow band noise. (13)

15. (a) Compute two different Huffman codes for the source with the probabilities 0.4, 0.2, 0.2, 0.1, 0.1 (13)

Or

(b) State Shannon's theorem and illustrate Shannon Fano algorithm with example. (13)

PART C — (1 × 15 = 15 marks)

16. (a) With neat circuit diagrams of pre-emphasis and de-emphasis circuits, justify its uses in FM System. (15)

Or

(b) Draw an envelope detector used for demodulation of AM and explain its operation? (15)