

Paper Id: 

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**B.TECH**  
**(SEM VIII) THEORY EXAMINATION 2018-19**  
**COMMUNICATION ENGINEERING**

Time: 3 Hours

Total Marks: 100

**Note:** Attempt all Sections equally & give answers in neat handwriting.

**S E C T I O N**

**1. Attempt all questions brief. 2 x 10 = 20**

- a) What is modulation index?
- b) What do you understand by a Frequency spectrum of a wave?
- c) Explain sampling theorem.
- d) Explain the difference between PCM and PPM.
- e) What is Satellite Orbits?
- f) Describe the satellite parameters.
- g) Explain the Shannon's theorem for information coding.
- h) Explain the Channel capacity and Bandwidth.
- i) Describe the advantages of cellular communication system.
- j) Differentiate between channel capacity and channel assignment.

**SECTION B**

**2. Attempt any three of the following: 10 x 3 = 30**

- a) Explain the term amplitude modulation? Give a graphical representation of an AM wave. Draw the frequency spectrum of FM wave.
- b) Describe the principle of pulse modulation. Explain the Pulse Code Modulation Technique with advantages and applications.
- c) Describe the satellite link model in Satellite Communication systems. Explain the GPS services.
- d) What are error detection codes? Describe the various types of error-detection codes and explain how they detect data errors.
- e) Compare various cellular standards. Describe the features of GSM & GPRS systems.

**SECTION C**

**3. Attempt any one part of the following: 10 x 1 = 10**

- (a) Describe transmission efficiency. Derive an expression for the transmission efficiency of AM wave.
- (b) What is a super heterodyne receiver? Differentiate between a super heterodyne AM receiver & a super heterodyne FM receiver.

**4. Attempt any one part of the following: 10 x 1 = 10**

- (a) Explain digital modulation systems. Describe various digital modulation systems with one application.

- (b) Explain the difference between a PWM wave & PPM wave. Describe a method for the conversion of a PWM wave to PPM wave.

5. Attempt any *one* part of the following: 10 x 1 = 10

- (a) Explain the working of a microwave radio system with the help of a block diagram.  
(b) Explain the terminal station and a repeater station in a Microwave communication system.

6. Attempt any *one* part of the following: 10 x 1 = 10

- (a) Explain the fundamental principle of information, Entropy & Information rate. Derive a relation describing the relation between Entropy & Information.  
(b) What is S/N trade off? Explain how noise signal can be reduced without degrading the quality of information signal.

7. Attempt any *one* part of the following: 10 x 1 = 10

- (a) Explain the uniqueness of mobile radio environment & Performance metrics in cellular system.  
(b) Describe the principle of operation of a basic cellular system. Describe the performance analysis of CDMA-2000 and WCDMA.

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