Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17EC2012** | **Duration :** | **3hrs** |
| **Sub. Name :** | **COMMUNICATION THEORY AND SYSTEMS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q.**  **No.** | **Sub**  **Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | With a neat block diagram, explain the principle of operation of a basic communication system. | CO1 | 8 |
| b. | Compare low level with high level modulation. | CO1 | 4 |
| c. | What are the advantages of suppressing a carrier during transmission? | CO1 | 2 |
| d. | Draw the frequency spectrum of AM with carrier and phasor representation of AM. | CO1 | 6 |
| **(OR)** | | | | |
| 2. | a. | Explain the principle of operation of balanced modulator for generating AM with carrier. | CO1 | 8 |
| b. | Discuss the different distortion occurs in diode detectors used for AM demodulation. | CO1 | 4 |
| c. | Explain the principle of operation of envelope detector used for AM detection with neat sketch. | CO1 | 8 |
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| 3. | a. | Define modulation index and frequency deviation of FM. | CO2 | 4 |
| b. | Distinguish between direct and indirect method of FM generation. | CO2 | 4 |
| c. | In a FM wave the frequency deviation is 25 KHz. What is the phase deviation when the modulating signal frequency is 100 Hz and 10 KHz? | CO2 | 6 |
|  | d. | Explain the basic varactor diode modulator circuit for FM Generator. | CO2 | 6 |
| **(OR)** | | | | |
| 4. | a. | Explain why the power remains constant in FM. | CO2 | 4 |
| b. | With neat diagrams, explain the principle of operation of ratio detector. Compare its merits over Foster Seeley discriminator. | CO2 | 10 |
| c. | Draw the block diagram of Armstrong method of FM generation method. | CO2 | 6 |
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| 5. | a. | With neat block diagram, explain the high level AM transmitter. | CO4 | 10 |
| b. | Give the significance of Image Frequency Rejection, Frequency Conversion and IF amplifier. | CO4 | 6 |
| c. | Explain the term noise temperature. | CO6 | 4 |
| **(OR)** | | | | |
| 6. | a. | Discuss the various characteristics of Receivers. | CO4 | 6 |
| b. | Explain the principle of operations of FM superheterodyne receiver with a neat block diagram. | CO4 | 10 |
| c. | Explain the noise figure. | CO6 | 4 |
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| 7. | a. | Discuss the working principles of SSB transmitter. | CO5 | 6 |
| b. | Draw the block diagram of FM transmitter and explain in detail. | CO5 | 10 |
| c. | The equivalent noise temperature of a parametric amplifier is 20ºK.  Find out the noise factor. | CO6 | 4 |
| **(OR)** | | | | |
| 8. | a. | Derive the calculation of output signal to noise ratio of SSB-SC systems. | CO6 | 10 |
| b. | Discuss the working principles of ISB transmitter. | CO5 | 6 |
| c. | Explain the Frequency Stabilization. | CO5 | 4 |
|  | | **Compulsory:** |  |  |
| 9. | a. | With suitable diagram, explain how frequency demodulations can be performed using Foster Seeley discriminator. | CO5 | 8 |
| b. | Obtain the expression for effective noise figure of cascaded stage. | CO6 | 4 |
| c. | Explain the noise performance of DSB-SC AM and also represent an improvement in S/N ratio by factor of 2 for DSB-SC systems. | CO6 | 8 |