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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April/May – 2017**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14EC2013** | **Duration :** | **3hrs** |
| **Sub. Name :** | **COMMUNICATION THEORY AND SYSTEMS** | **Max. marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Derive the expression to find the total power in DSBFC AM system. | CO1 | 08 |
|  | b | Illustrate the principle of amplitude modulation (DSBFC).   1. Derive the expression for instantaneous voltage of modulated wave. 2. Draw the time domain representation of AM waveform. 3. Define Modulation index. 4. Draw the Frequency spectrum of AM waveform. | CO1 | 12 |
| (OR) | | | | |
| 2. | a. | Elaborate on the block diagram of communication system. | CO1 | 10 |
| b. | Justify the need for modulation in communication systems with illustrations. | CO1 | 10 |
| 3. | a. | Give a detailed description on Square law modulator. | CO2 | 12 |
|  | b. | Explain how Ring modulator operates with necessary diagrams. | CO2 | 08 |
| (OR) | | | | |
| 4. | a. | Infer and analyze the output of a synchronous demodulator based on DSB-SC and SSB-SC as inputs. | CO2 | 12 |
|  | b. | Summarize on VSB systems. | CO2 | 08 |
| 5. | a. | Provide a description on Foster seeley discriminator. | CO2 | 12 |
|  | b. | An FM wave is represented by the voltage equation  emod(t) = 40Sin (7x106 t +7 sin 5x104 t)  Calculate   1. Modulating and Carrier frequency. 2. Frequency Deviation. 3. Modulation Index. | CO2 | 08 |
| (OR) | | | | |
| 6. | a. | Derive the mathematical analysis for frequency modulation with related waveforms. | CO1 | 10 |
|  | b. | Mention the purpose of using balanced slope detector and explain it with necessary diagrams. | CO1 | 10 |
| 7. | a. | Elaborate on AM broadcast transmitter with neat diagram. | CO2 | 10 |
|  | b. | With necessary diagram, explain in detail about FM receiver. | CO2 | 10 |
| (OR) | | | | |
| 8. | a. | Illustrate the operation of Superheterodyne Receiver with suitable figures. | CO2 | 10 |
|  | b. | Demonstrate the working of SSB transmitters with necessary diagram. | CO2 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Derive the expression for signal to noise ratio in DSB-SC amplitude modulation sysem. | CO3 | 10 |
|  | b. | Deduce the expression for noise figure in three stage cascaded amplifier. | CO3 | 10 |