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| Question  No | WRT | **2 Mark Questions** | 4 | 2 |  |
| 1 |  | Explain the modulation of the VSB-SC technique with a neat block diagram. |  | 2 | CO-2 |
|  |  |  |  |  |  |
| 2 |  | Explain the demodulation of SSB-SC signals. |  | 2 | CO-2 |
|  |  |  |  |  |  |
| 3 |  | Draw the spectrums of DSB-SC and SSB-SC signals. |  | 2 | CO-1 |
|  |  |  |  |  |  |
| 4 |  | What is a balanced modulator/product modulator? How does it generate a DSB-SC signal? |  | 2 | CO-2 |
|  |  |  |  |  |  |
| 5 |  | Derive the time domain equations for USB and LSB of the SSB-SC signal. |  | 2 | CO-2 |
|  |  |  |  |  |  |
| 6 |  | How does VSB modulation differ from SSB and DSB-SC in terms of time-domain characteristics? |  | 2 | CO-2 |
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| Question  No | WRT | **5 Mark Questions** | 4 | 2 |  |
| 1 |  | Explain the concept of **Single Sideband (SSB) modulation**. What are the advantages of SSB over conventional AM and DSBSC? |  | 5 | CO-2 |
|  |  |  |  |  |  |
| 2 |  | Write the Time Domain and Frequency-Domain Representation of DSBSC. |  | 5 | CO-2 |
|  |  |  |  |  |  |
| 3 |  | Explain the demodulation of the DSB-SC technique with appropriate derivation. |  | 5 | CO-2 |
|  |  |  |  |  |  |
| 4 |  | Describe the **frequency-domain representation** of a single-sideband (SSB) wave. How is bandwidth affected in SSB modulation compared to other AM schemes? |  | 5 | CO-2 |
|  |  |  |  |  |  |
| 5 |  | Explain the process of **coherent detection (demodulation)** of SSB signals. |  | 5 | CO-2 |
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| 6 |  | Discuss the VSB-SC demodulation technique with frequency domain equations. |  | 5 | CO-2 |
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| Question  No | WRT | **12 Mark Questions** | 4 | 2 |  |
| 1 |  | Explain the generation of DSBSC waves using a balanced modulator. Draw a suitable block diagram and explain its working in detail. |  | 12 | CO-2 |
|  |  |  |  |  |  |
| 2 |  | Describe the working of a ring modulator for generating DSBSC waves. Explain the circuit diagram and its advantages over a balanced modulator. |  | 12 | CO-2 |
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| 3 |  | With the help of a block diagram and necessary explanation, describe the **Phase Discrimination Method** for generating SSB waves. How does this method help in suppressing one of the sidebands? |  | 12 | CO-2 |
|  |  |  |  |  |  |
| 4 |  | Discuss the frequency discrimination method for generating the SSB-SC signal. |  | 12 | CO-2 |
|  |  |  |  |  |  |
| 5 |  | Describe the Generation of a Vestigial Sideband (VSB) modulated wave with the help of a block diagram and explanation. |  | 12 | CO-2 |
|  |  |  |  |  |  |
| 6 |  | Compare different Amplitude Modulation techniques: AM, DSBSC, and VSB. Use a tabular form for clarity. |  | 12 | CO-2 |
|  |  |  |  |  |  |
| 7 |  | 1. A 400W carrier is amplitude modulated to a depth of 100%. Calculate the total power in the case of the AM and DSBSC techniques. Formulate how much power is saved in watts for DSBSC? If the depth of modulation is changed to 75%, then how much power in watts is required for transmitting the DSBSC wave? Invent the power required for DSBSC in both cases and comment on the reason for a change in the power levels. 2. Determine the Bandwidth of DSBSC and SSBSC when the message frequency is 5 kHz |  | 12 | CO-3 |
|  |  |  |  |  |  |