

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-V (NEW) EXAMINATION – WINTER 2022****Subject Code:3151104****Date:11-01-2023****Subject Name:Analog and Digital Communication****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

**MARKS**

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|------------|---|-----------|
| <b>Q.1</b> | (a) Define: Modulation, SNR and Channel capacity.   | <b>03</b> |
|            | (b) Explain Noise immunity of digital signals.  | <b>04</b> |
|            | (c) Explain the classification of signals.  | <b>07</b> |
| <b>Q.2</b> | (a) Explain DSB amplitude modulation with necessary figures.  | <b>03</b> |
|            | (b) Explain PLL.  | <b>04</b> |
|            | (c) Write a note on Envelope detector.  | <b>07</b> |
|            | <b>OR</b>   |           |
|            | (c) VSB is a clever compromise between SSB and DSB for broadcast television. Justify.                   | <b>07</b> |
| <b>Q.3</b> | (a) State the unique features of FM.  | <b>03</b> |
|            | (b) How the FM waves are generated?   | <b>04</b> |
|            | (c) Explain Preemphasis and Deemphasis in FM broadcasting.  | <b>07</b> |
|            | <b>OR</b>   |           |
| <b>Q.3</b> | (a) What is modulation index for FM?  | <b>03</b> |
|            | (b) Write a note on demodulation of FM.   | <b>04</b> |
|            | (c) Write a note on FM receiver.  | <b>07</b> |
| <b>Q.4</b> | (a) State and prove Sampling theorem.   | <b>03</b> |
|            | (b) What is interpolation? Explain signal reconstruction using the interpolation formula.               | <b>04</b> |
|            | (c) State the advantages of Digital Communication.  | <b>07</b> |
|            | <b>OR</b>   |           |
| <b>Q.4</b> | (a) What is Companding?   | <b>03</b> |
|            | (b) How to remove the disadvantage of thresholding of coding and overloading found in Delta modulation? | <b>04</b> |
|            | (c) Write a note on Differential Pulse Code Modulation.   | <b>07</b> |
| <b>Q.5</b> | (a) What is scrambling? Draw a typical scrambler and descrambler.                                       | <b>03</b> |
|            | (b) What is an Eye diagram? Explain with example.   | <b>04</b> |
|            | (c) Explain the components of digital communication system.   | <b>07</b> |
|            | <b>OR</b>   |           |
| <b>Q.5</b> | (a) What do you understand by M-ary communication?  | <b>03</b> |
|            | (b) Compare ASK and FSK.  | <b>04</b> |
|            | (c) Draw and explain a Regenerative Repeater in detail.   | <b>07</b> |

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