**POORNIMA UNIVERSITY, JAIPUR**

**END SEMESTER EXAMINATION, November 2022**

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|  | **3BT5104** | Roll No. | Total Printed Pages: 2 |
| **3BT5104** |  |
| B. Tech. III Year V-Semester (Main/Back) End Semester Examination, November 2022  **(EC)** | |
| **BEC05104 : Analog & Digital Communication Systems** | | | |

# Time: **3** Hours. Total Marks: **60**

Min. Passing Marks: **21**

Attempt **five** questions selecting one question from each Unit. There is internal choice from Unit I to Unit V. Marks of each question or its parts are indicated against each question / parts. Draw neat sketches wherever necessary to illustrate the answer. Assume missing data suitably (if any) and clearly indicate the same in the answer.

Use of following supporting material is permitted during examination for this subject.

# **1.--------------------------Nil--------------------** **2. ------------------Nil-----------------------**

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|  |  | **UNIT-I (CO1)** | **Marks** | **Bloom Level** |
| **Q.1** | **(a)** | Out of AM, DSB-SC, SSB-SC & VSB Analog Modulation techniques, which one requires the minimum channel bandwidth & transmitted power? Give reasons to support your answer. | **(6)** | **L3, L4** |
|  |  |  |  |  |
|  | **(b)** | Explain difference between AM, FM & PM | **(6)** | **L3** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
|  |  |  |  |  |
| **Q.2** | **(a)** | Explain in detail about generation & detection of Wide Band Frequency Modulation with diagram. | **(6)** | **L3** |
|  |  |  |  |  |
|  | **(b)** | Prove that the total power of amplitude modulated signal is  Pt = Pc (1 + ma2/2) Where, Pc- Carrier Power, µ - Modulation Index. | **(6)** | **L4** |
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|  |  | **UNIT-II (CO2)** |  |  |
|  |  |  |  |  |
| **Q.3** | **(a)** | Explain typical PPM system. How the generation & demodulation is done? | **(6)** | **L2** |
|  |  |  |  |  |
|  | **(b)** | Explain & prove Sampling Theorem. Analyse all type of sampling techniques with mathematical expression & circuit diagram. | **(6)** | **L2** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.4** | **(a)** | Explain Pulse Amplitude Modulation with diagram. | **(6)** | **L2** |
|  |  |  |  |  |
|  | **(b)** | What is Inter symbol interference? Explain causes, effect and remedies to reduce the ISI in Communication system. | **(6)** | **L3** |
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|  |  | **UNIT-III (CO3)** |  |  |
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| **Q.5** | **(a)** | Explain PSK Modulation & Demodulation with error probabilities. | **(6)** | **L3** |
|  |  |  |  |  |
|  | **(b)** | Explain Quadrature Amplitude Modulation. | **(6)** | **L3** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.6** | **(a)** | Explain QPSK modulation & demodulation. | **(6)** | **L3** |
|  |  |  |  |  |
|  | **(b)** | Explain FSK Modulation & Demodulation with error probabilities. | **(6)** | **L3** |
|  |  |  |  |  |
|  |  | **UNIT-IV (CO4)** |  |  |
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| **Q.7** | **(a)** | Represent 1001110110 using following digital data format:  (1) Polar RZ & NRZ (2) Bipolar NRZ (3) AMI NRZ | **(6)** | **L4** |
|  |  |  |  |  |
|  | **(b)** | Explain Source encoding theorem with example. | **(6)** | **L3** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.8** | **(a)** | A source emits seven messages with probabilities 1/3, 1/3, 1/9, 1/9, 1/9, 1/27 and 1/27 respectively. Find the entropy of the source and compact binary code and also find the average length of the codeword. Determine the efficiency and redundancy of this code. | **(6)** | **L4** |
|  |  |  |  |  |
|  | **(b)** | Derive expression of Shannon Channel Capacity. | **(6)** | **L3** |
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|  |  | **UNIT V (CO5)** |  |  |
|  |  |  |  |  |
| **Q.9** | **(a)** | Explain Architecture of Global System for Mobile Communications with diagram. | **(6)** | **L3** |
|  |  |  |  |  |
|  | **(b)** | Explain Code division multiple access (CDMA) | **(6)** | **L3** |
|  |  |  |  |  |
|  |  | **OR** |  |  |
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| **Q.10** | **(a)** | What do you understand by Cellular Concept and Frequency Reuse in mobile communication? | **(6)** | **L3** |
|  |  |  |  |  |
|  | **(b)** | Explain different technique of Handovers. Also explain Channel Assignment technique in mobile communication. | **(6)** | **L3** |