

M.Sc. S.Y. (Electronics) (NEP Pattern) - Semester-III  
**PSCELT302 - Paper-II : Digital Communication**

P. Pages : 2

Time : Three Hours



**GUG/W/24/15976**

Max. Marks : 80

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- Notes : 1. All questions are compulsory and carry equal marks.  
2. Draw neat and label diagrams wherever necessary.

**Either:**

1. a) Explain the following with examples. 8  
i) Differentiate between periodic and random signals, and  
ii) Energy and power signals.  
b) Discuss the significance of unit impulse function. 8

**OR**

- c) State and explain any four properties of Fourier transform. 8  
d) State and prove Parseval's theorem. 8

**Either:**

2. a) State and prove sampling theorem. 8  
b) Draw the block diagram of digital communication system and explain it. 8

**OR**

- c) Explain the generation and detection of PWM with suitable diagram. 8  
d) Explain the Nyquist's first criterion for zero ISI. 8

**Either:**

3. a) Explain the Delta modulation state its advantages. 8  
b) Explain the QPSK generator with suitable diagram. 8

**OR**

- c) Explain the adaptive delta modulation system with suitable diagram. State its advantages. 8  
d) Differentiate between PSK and FSK. 8

**Either:**

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|-----------|----|---|----------|
| <b>4.</b> | a) | What is Entropy? Explain entropy of a source. | <b>8</b> |
|           | b) | State and prove Shannon's coding theorem.     | <b>8</b> |

**OR**

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|-----------|-----|--|----------|
|           | c)  | Write short note on:   | <b>8</b> |
|           | i)  | Channel capacity, and  |          |
|           | ii) | Huffman code   |          |
|           | d)  | What is information? Explain with suitable example how it can be measured. | <b>8</b> |
| <b>5.</b> | a)  | Explain the shifting property of Dirac delta function.                     | <b>4</b> |
|           | b)  | Explain eye pattern in digital communication.                              | <b>4</b> |
|           | c)  | What is slope overload? Explain.   | <b>4</b> |
|           | d)  | What is syndrome decoding?   | <b>4</b> |

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