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**015401**

**May 2024**

**B. Tech. (ENC) (Fourth Semester)**

**Digital Communication (ECP-401)**

*Time :* 3 *Hours*] [*Maximum Marks :* 75

**Note :** It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other.

## Part A

1. (a) Define Digital signal. Give its any *two* applications. **1.5**

   (b) Enlist any *three* properties of Fourier Transform. Give their significance also. **1.5**

   (c) Enlists any *three* salient features of Interface RS 232. **1.5**

   (d) Define differential Manchester encoding. Also, give its merits. **1.5**

   (e) What is meant by connection-oriented services ? Give examples and applications. **1.5**

(f) Define Frequency division multiplexing. Give its any *two* applications. **1.5**

(g) Make comparisons between Amplitude and Phase modulation. **1.5**

(h) What is meant by Run length encoding ? Give its merits and demerits. **1.5**

(i) State and explain Nyquist theorem. **1.5**

(j) Define CRC. Give its advantages. **1.5**

## Part B

**2.** (a) Explain any *two* properties of Fourier series. Also, discuss the effects of limited bandwidth on digital signals. **10**

(b) What is meant by PSD and ESD ? Differentiate between digital and analog signals. **5**

**3.** (a) Make comparisons among Twisted pair, Coaxial and Fiber optic-cables. **5**

(b) Define the terms NRZ and delay distortion. Explain the operation of X.21 interface. **10**

**4.** Differentiate simplex, half duplex and full duplex communication modes. Using an example. explain the concept of sliding window protocol and virtual circuits. **15**



**5.** (a) Make differences between circuit switching and packet switching systems. **5**

(b) Define PSTN. Using schematics, explain the working, merits and demerits of ISDN. **10**

**6.** (a) What is security in data communications ? Using an example, explain parity check, block sum check and frame check sequences used for Error detection. **10**

(b) Make comparisons between secret-key cryptography and public-key cryptography. **5**

**7.** Differentiate between feedback, forward-error control approaches. Using an example, explain the operation and advantages of Huffman encoding in digital communication. **15**