Registration No.:

4ʰ Semester Regular/Back Examination: 2023-24
Data Communication
CSE, CSEAI, CSEAIME, CST, IT, C&EE, CIVIL
Time: 3 Hour
Max Marks: 100
Q.Code: P229
Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.
The figures in the right-hand margin indicate marks.

Part-I

Q1	Answer the following questions:	(2 x 10)

a) Define the term "Open Systems Interconnection".
b) What is the difference between serial and parallel data transmission?
c) Explain the concept of signal-to-noise ratio.
d) What is meant by 'M-ary Encoding'?
e) Describe one advantage and one disadvantage of optical fiber cables.
f) What are "Light Detectors" used for in optical fiber communications?
g) Define Pulse Code Modulation (PCM).
h) What is meant by the term "Companding" in digital transmission?
i) Explain the function of a Digital Service Unit (DSU).
j) What is the significance of error detection in data communication?

Part-II

Q2	Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)	(6 × 8)

a) Discuss various modulation and demodulation techniques used in analog systems.
b) Explain the impact of electromagnetic waves' characteristics on metallic cable transmission.
c) Describe the block diagram of an Optical Fiber Communications System.
d) Compare and contrast Linear and Nonlinear PCM Codes.
e) Outline the T1 Digital Carrier System and its significance in multiplexing.
f) Discuss the concept of Wavelength-Division Multiplexing and its applications.
g) Explain how microwave communication systems work.
h) Describe the synchronization process in asynchronous voice-band modems.
i) What is the AT Command Set in modem control, and why is it important?
j) Explain the principles and applications of satellite communication systems.
k) Detail the error control mechanisms used in data communications.
l) Discuss the different types of bar codes and their relevance in data formats.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

Q3 Provide a comprehensive analysis of the standards organizations for data communications, including their roles and how they influence network architecture. **(16)**

Q4 Conduct an in-depth discussion on the propagation of light through an optical fiber cable, including the technical considerations and the implications of various fiber modes and classifications. **(16)**

Q5 Describe the complete architecture and functioning of wireless communication systems, including terrestrial propagation of electromagnetic waves, skip distance, and path loss. **(16)**

Q6 Evaluate the different data communication protocols covered in the syllabus, focusing on their design, functionality, and application in modern networks. **(16)**