

**R09**

Code: 9A04807

B.Tech IV Year II Semester (R09) Advanced Supplementary Examinations, July 2013

**DATA COMMUNICATIONS**

(Common to ECE and EConE)

Time: 3 hours

Max. Marks: 70

Answer any FIVE questions  
All questions carry equal marks

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- 1 (a) Explain the layered architecture.  
(b) Explain information capacity.  
(c) If a binary signal is sent over a 3 KHz channel whose signal-to-noise ratio is 20 dB. What is the maximum achievable data rate?
- 2 (a) Explain the types of transmission lines.  
(b) Determine the characteristic impedance for an air dielectric two-wire parallel transmission line with a D/r ratio = 12.22.  
(c) Explain the optical fiber communication system with neat block diagram.
- 3 (a) Explain pulse code modulation and derive the expression for signal voltage-to-quantization noise voltage ratio.  
(b) Explain T1 digital carrier system.
- 4 (a) Explain electromagnetic radiation.  
(b) What is terrestrial propagation of electromagnetic waves? Describe ground wave and space wave propagation.  
(c) For an isotropic antenna radiating 100 W of power, determine:  
(i) Power density 1000 m from the source.  
(ii) Power density 2000 m from the source.
- 5 (a) Describe basic telephone call procedures.  
(b) What are the transmission parameters? Explain any one category.  
(c) Draw the voice-frequency circuit arrangement.
- 6 (a) Explain the USDC digital voice channel.  
(b) Explain global system for mobile communications.  
(c) Determine the transmit and receive carrier frequencies for channel 3.
- 7 (a) Write about compatible voice-band modems.  
(b) Write the comparisons between asynchronous and synchronous voice-band modems.  
(c) Explain the asymmetry of 56K modems.
- 8 (a) Explain the data transmission modes.  
(b) Describe the high-level-data link control.  
(c) Insert 0s from the following SDLC data stream.

111 001 000 011 111 111 100 111 110 100 111 101 011 111 111 111 001 011

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