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Total No. of Questions—12]

[Total No. of Printed Pages—4+1

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[4262]-216

S.E. (Information Technology) (II Sem.) EXAMINATION, 2012

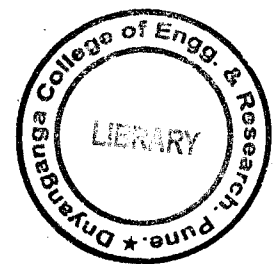
DATA COMMUNICATIONS

(2008 PATTERN)

Time : Three Hours

Maximum Marks : 100

- N.B. :—**
- (i) Answer questions 1 or 2, 3 or 4, 5 or 6 from Section I and questions 7 or 8, 9 or 10, 11 or 12 from Section II.
 - (ii) Answers to the two Sections should be written in separate answer-books.
 - (iii) Neat diagrams must be drawn wherever necessary.
 - (iv) Figures to the right indicate full marks.
 - (v) Assume suitable data, if necessary.



SECTION I

1. (a) Explain the Data Communication System with its *five* components and discuss the fundamental characteristics of Data Communication System. Give the different forms in which data can be represented.

[8]

P.T.O.

- (b) Explain four levels of addresses used in an Internet. Draw the diagram to show the relationship of Layers and Addresses in TCP/IP. [8]

Or

2. (a) Explain with diagram Pulse Code Modulation. Define the term Quantization Error. [8]
- (b) Draw the diagram of OSI model. Discuss briefly the functions of each layer. [8]
3. (a) Explain the following : [8]
- (i) Amplitude Modulation
- (ii) Frequency Modulation
- Draw the frequency domain representation of AM and FM wave.
- (b) Define Spread Spectrum and its goal. Explain FHSS and DSSS. [8]

Or

4. (a) Define Multiplexing and De-Multiplexing. Explain Frequency—Division Multiplexing and Wavelength—Division Multiplexing. [8]
- (b) Explain the following methods of Digital to Analog conversion : [8]
- (i) ASK

- (ii) FSK
- (iii) PSK
- (iv) QAM.

5. (a) Draw the diagram of an electromagnetic spectrum for Wireless Communication. Explain various modes of propagation for Unguided Signal. [9]
- (b) Explain the circuit switched network. What are the three phases of it ? Draw Delay diagram. [9]

Or

6. Write short notes on (6 marks each) : [18]
- (i) Asymmetric Digital Subscriber Line (ADSL)
 - (ii) Virtual Circuit Network
 - (iii) Signaling System Seven (SS7).

SECTION II

7. (a) What is hamming distance ? Explain with example. Explain simple parity check code. [8]
- (b) Explain different ARQ techniques. Comment on the performance of each. [8]

Or

8. (a) Explain various station types and configurations used in HDLC. [8]
- (b) What is CRC ? Generate the CRC code for message 1101010101. Given generator polynomial $g(x) = x^4 + x^2 + 1$. [8]
9. (a) Discuss CSMA/CD Random Access techniques. How is collision avoidance achieved in the same ? [8]
- (b) Explain the following physical layer implementations in standard Ethernet :
- (i) 10Base5
 - (ii) 10Base2
 - (iii) 10BaseT
 - (iv) 10BaseF
- with respect to media, maximum length and line encoding. [8]

Or

10. (a) Explain FDMA, TDMA and CDMA in detail. [8]
- (b) Discuss Gigabit Ethernet with reference to the following : [8]
- (i) MAC Sub-layer
 - (ii) Gigabit Ethernet Frames.

11. Write short notes on :

- (i) Working of Switch and Router. [6]
- (ii) Virtual LAN. [6]
- (iii) SONET Layers. [6]

Or

12. Write short notes on :

- (i) Backbone Network. [6]
- (ii) SONET Devices. [6]
- (iii) Working of Router and Gateway. [6]

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