

2011

**DATA COMMUNICATION & COMPUTER  
NETWORK**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**GROUP - A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following :  $10 \times 1 = 10$ 
  - i) FTP stands for
    - a) File Transfer Protocol
    - b) File Tree Protocol
    - c) Field Transfer Protocol
    - d) none of these.
  - ii) The end to end delivery of the entire message is the responsibility of
    - a) Network Layer
    - b) Transport Layer
    - c) Session Layer
    - d) Presentation Layer.
  - iii) Power gain can be represented as
    - a)  $20 \log_2 (P_2/P_1)$
    - b)  $10 \log_2 (P_2/P_1)$
    - c)  $\log_2 (P_2/P_1)$
    - d) none of these.
  - iv) Shannon capacity determines
    - a) noise present in the channel
    - b) highest data rate in a noisy channel
    - c) channel is noiseless
    - d) all of these.

- v) The number of network in class A addressing system is
- a)  $2^8$
  - b)  $2^{16}$
  - c)  $2^{32}$
  - d)  $2^{24}$
- vi) What is the network address for 198.76.9.23 ?
- a) 198.0.0.0
  - b) 198.76.0.0
  - c) 198.76.9.0
  - d) none of these.
- vii) In digital transmission
- a) bit rate is higher than baud rate
  - b) bit rate is lesser than baud rate
  - c) bit rate is equal to baud rate
  - d) none of these.
- viii) Framing is done in ..... layer.
- a) physical
  - b) data link
  - c) transport
  - d) network.
- ix) Digital signature is
- a) Symmetric key cryptography
  - b) Asymmetric key cryptography
  - c) both (a) and (b)
  - d) none of these.
- x) Which of the following works in 7 layers ?
- a) Router
  - b) Switch
  - c) Hub
  - d) Gateway.

### GROUP - B

#### ( Short Answer Type Questions )

Answer any *three* of the following.

$3 \times 5 = 15$

What are the advantages of digital transmission over analog transmission ?

Write short notes on the following:

a) Full Duplex

b) Half Duplex

Define bit rate and baud rate. An analog signal carries four bits in each signal element. If 1000 signal elements are sent per second, find the baud rate and bit rate.

$3 + 2$

What are the functions of DTE and DCE ? Give an example of each. What does the modem stand for ? What is null modem ?

$2 + 1 + 1 + 1$

a) Draw the various fields in IP packet header.

b) What is the purpose of DSCP field ?

$3 + 2$

### GROUP - C

#### ( Long Answer Type Questions )

Answer any *three* of the following.

$3 \times 15 = 45$

a) Draw a digital encoding format for NRZI, Manchester code, Differential Manchester coding for the digital signal 01001100011 and also write down the procedure in brief.

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b) Compare TCP/IP with OSI layer architecture. What are the major differences between these two protocols ?

$3 + 3$

8. a) What are the X.25 layer ? How does each relate to the OSI model ? 4
- b) How does the frame layer address field differ from the HDLC address field ? 3
- c) Explain the token ring network (IEEE 802.5) & FDDI. 5
- d) What do you mean by data security ? 3
9. Analyze the performance of pure ALOHA. How does slotted ALOHA improve the performance over pure ALOHA ? In both the cases find the expression for average delay and throughput. Compare the performance of pure ALOHA with slotted ALOHA. 4 + 5 + 6
10. a) Explain the reasons why the TCP/IP model came out as winner in the battle of the internet over ISO-OSI. 6
- b) What are adoptive and non-adoptive routings ? Give examples. 6
- c) Explain with diagram, how the lost frame, delayed and lost acknowledgements are handled in Go-Back-N ARQ. 3
11. Write short note on (any three) : 3 × 5
- i) PCM
  - ii) Piggy backing
  - iii) ALOHA
  - iv) Symmetric key cryptography
  - v) DNS.