Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(ICE)/SEM-6/CS-611/2012

2012

COMPUTER NETWORK AND INTERNETWORKING

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 any *ten* of the following : 10 × 1 = 10

i) Router works in

a) physical layer b) data link layer

c) network layer d) all of these.

ii) Which of the following encoding methods does not provide for synchronization ?

a) NRZ-L b) RZ

c) NRZ-I d) Manchester.

iii) Which multiplexing technique transmits digital signal ?

a) FDM b) TDM

c) WDM d) None of these.

iv) If the ASCII character *H* is sent and the character *I* is received, what type of error is this ?

a) Single bit b) Multiple bit

c) Burst d) Recoverable.

v) Identify the class of IP address 191.1.2.3 from the following :

a) class-A b) class-B

c) class-C d) class-D.

vi) Given the IP address 201.14.78.65 and the subnet mask 255.255.255.224, what is the subnet address ?

a) 201.14.78.32 b) 201.14.78.65

c) 201.14.78.64 d) 201.14.78.12.

vii) Before data can be transmitted, they must be converted into

a) Low-frequency sine wave

b) Electromagnetic signals

c) Aperiodic signals

d) None of these.

viii) The address required to uniquely identify a running application program is

a) IP address b) NIC address

c) Socket address d) None of these.

ix) The number of physical links in a fully connected network with n nodes is

a) n b) $n*(n-1)/2$

c) $n*n$ d) $n*(n-1)$.

x) Communication between a computer and a keyboard involves ..... communication.

a) simplex b) half-duplex

c) full-duplex d) automatic.

xi) In asynchronous transmission, the number of stop bits required at the end of each byte is

a) always one b) two or more

c) one or more d) two.

xii) Physical layer is responsible for

a) error detection

b) error correction

c) transmission of raw bits

d) machine to machine communication.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What is the difference between pure ALOHA and slotted ALOHA ? Derive throughput for pure ALOHA. 2 + 3

3. Name three types of transmission impairments. Describe attenuation and distortion. 3 + 2

4. Compare different types of network topologies. 5

5. a) What do you mean by ARQ protocol ? What are different types of ARQ protocols ? 2

b) Describe Go-back-N ARQ protocol. Write how to handle loss of acknowledgment. 3

6. a) Find the minimum bandwidth for the path using FDM with 5 devices each requiring 4000 Hz and 200 Hz guard band for each device. 2

b) Why is flow control needed ? What is piggybacking ? 2 + 1

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) What is PCM ? Why is it used ? Explain PCM by giving an example. What do you mean by FM ? What is the bandwidth of each FM radio station ? Why we need analog to analog conversion ? 1 + 2 + 3 + 1 + 1 + 2

b) What is FDM ? Assume that a voice channel occupies a bandwidth of 4 kHz. We need to combine three voice channels into a link with a bandwidth of 12 kHz, from 20 to 32 kHz. Show the configuration using frequency domain. Assume there are no guard bands. 2 + 3

8. a) What do you mean by routing ? What is the difference between Static and Dynamic routings ?

b) What are the differences between TCP and UDP ?

c) Compare and contrast distance vector routing and link state routing. Discuss distance vector routing algorithm with an example.

d) Briefly describe ARP. 3 + 2 + (2 + 6) + 2

9. a) Discuss CSMA /CD multiple access strategy. What is the difference between polling and selecting ? 6 + 2

b) i) What is the difference between encoding and modulation ? 3

ii) What is the major disadvantage in using NRZ encoding ? How do RZ and biphase encoding attempt to solve them ? 2 + 2

10. a) What do you mean by multiplexing ? What is the difference between FDM and TDM ? What do you mean by interleaving ? What are the applications of FDM and TDM ? 2 + 3 + 1 + 2

b) A multiplexer combines four 100 kbps channels using a time slot of 2 bits. Show the output with four arbitrary inputs. What is the frame rate ? What is the frame duration ? What is the bit rate after multiplexing ? What is bit duration ? 3 + 1 + 1 + 1 + 1

11. a) What do you mean by switching ? What are the differences between circuit switched network and packet switched network ? Why is circuit switching preferred to packet switching in real time communication ? 2 + 3 + 3

b) What are the different line coding techniques ? Show the signal to encode the information 110101 in those line coding techniques. Why are Manchester and differential Manchester encoding so popular ? 2 + 5