



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. $3 \times 5 = 15$

- 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)

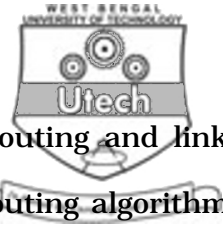
Answer any *three* of the following. 3 × 15 = 45

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

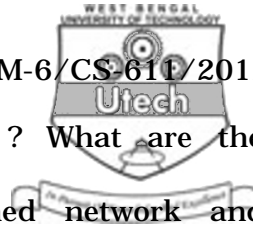
- b) What is FDM ? Assume that a voice channel occupies a bandwidth of 4 kHz. We need to combine three voice channels into a link with a bandwidth of 12 kHz, from 20 to 32 kHz. Show the configuration using frequency domain. Assume there are no guard bands. 2 + 3

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

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