Name : ....

Roll No. : ....

Invigilator's Signature : ....

CS/B.TECH/IT/NEW/SEM-6/IT-602/2013

2013

COMPUTER NETWORKING

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 :

$$10 \times 1 = 10$$

i)   The total number of links required to connect *n* devices

using Mesh Topology is

a) 2^n b) $n(n+1)/2$

c) $n(n-1)/2$ d) n^2.

ii)   Which of the following is a valid host for network

192.168.10.32/28 ?

a)   192.168.10.39   b)   192.168.10.49

c)   192.168.10.14   d)   192.168.10.54.

iii) Which of the following can be the beginning address of the block that contains 1024 address ?

a) 205.16.37.32

b) 190.16.42.0
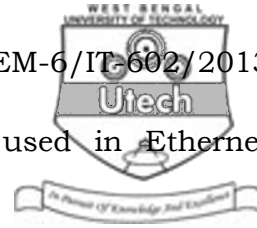
c) 17.17.32.0

d) 123.45.24.52

iv) Match the following :

A. DNS   1. Name service

B. FTP   2. File sharing

C. NFS   3. File transfer

D. SMTP   4. Mail service.

Of these

	A	B	C	D
a)	4	3	2	1
b)	1	2	3	4
c)	1	3	2	4
d)	2	4	3	1.

v) Which of the following is an application layer service ?

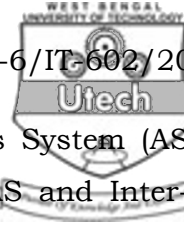a) FTP

b) Remote Log in

c) Mail service

d) All of these.

vi) Which channel access method is used in Ethernet network ?

    a)   CSMA/CD   b)   Token Bus

    c)   Token Ring   d)   All of these.

vii) A bridge has access to the .... address of a station on the same network.

    a)   Physical (MAC)   b)   Network

    c)   Service access point   d)   All of these.

viii) In .... there are no setup and teardown phases.

    a)   circuit switching

    b)   datagram switching

    c)   virtual circuit switching

    d)   none of these.

ix) Wavelength is .... proportional to propagation speed and .... proportional to period.

    a)   inversely, directly

    b)   directly, inversely

    c)   inversely, inversely

    d)   directly, directly

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

a) NRZ-L   b) RZ

c) NRZ-I   d) Manchester.

xi) The bit rate always equal to the baud rate in which type of signal ?

a) FSK   b) QAM

c) 4-PSK   d) All of these.

xii) Which error detection method can detect a burst error ?

a) The parity check

b) Two-dimensional parity check

c) CRC

d) All of these.

GROUP – B
(Short Answer Type Questions)
Answer any *three* of the following   3 × 5 = 15

2. a) In HDLC, what is bit stuffing and why is it needed ?   2

b) What is the minimum window size required for Go-Back-N ARQ protocol and how ?   3

3. a) What do you mean by an Autonomous System (AS) ? What is the difference between Intra-AS and Inter-AS routings ? Give an example of each routing protocol. 3

b) Draw the signal for the bit pattern 010011010 for Differential Manchester encoding technique. 2

4. Given a 10 bit sequence 1001010110 and a divisor 1011. Find the CRC.

5. What is peer to peer process ? What is the difference between OSI model and TCP/IP model ? We have a channel with 1 MHz bandwidth. The SNR for this channel is 63. What is the appropriate bit rate and signal level ? 1 + 2 + 2

6. Compare the pinconet and a scatternet in Bluetooth communication. A router outside the organization receives a packet with the destination address 190.240.7.91/16. Show how it finds the network address to route the packet. 2 + 3

GROUP – C

(Long Answer Type Questions)

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

7. a) An organization granted a block of address with the beginning address 14.24.74.0/24. There are 256 addresses in this block. The organisation needs to have 11 subnets. 2 subnets each have 64 addresses, 2 subnets each have 32 addresses, 3 subnets each have 16 addresses, 4 subnets each have 4 addresses. Design the subnets. 5

b) Compare connectionless and connection oriented approaches to connecting networks. 4

c) In a class *B* subnet, the IP address of one of the hosts and the mask are given below :

IP Address : 125.134.112.66

Mask : 255.255.224.0

What is the first address (network address) and the last address (broadcast address) in this subnet ? 2

d) Explain the Leaky Bucket algorithm for Congestion control. 4

8. a) The code 11110101101 was received. Using Hamming encoding algorithm, what is the original code sent ? 4

b) Suppose a system uses Go-back-N protocol with window size 3. If a sender wants to transmit 6 frames and every 4th frame is error, then calculate how many number of extra frames to be transmitted to the receiver. 4

c) What do you mean by count-to-infinity problem ? How is the problem partially overcome by the technique Split Horizon with Poisson Reverse method ? 5

d) What is the primary difference between RIP and BGP ? What is the value of infinity in case of RIP ? 2

9. a) Write the advantages of IPv6 over IPv4.

b) Write the main functions of Network layer.

c) Write all the fields of IP datagram.

d) Explain how selective repeat for sliding window protocols works. 3 + 3 + 5 + 4

10. a) What is the purpose of masking ?

b) An ISP has a block of 1024 addresses. It needs to divide the addresses among 1024 customers. Does it need subnetting ? Explain your answer.

c) Write the advantages of ICMP and IGMP over the IPv4.

d) What is transparent bridge ? How does a repeater extend the length of a LAN ? 3 + 3 + 5 + 4

11. What are the advantages of optical fibre over twisted-pair and coaxial cable ? Give an example for each class of unguided media. Why is DNS required ? What is the disadvantage of ADSL technology ? Give the details of HDLC frame format. What is the purpose of NAT ? 3 + 2 + 2 + 2 + 3 +3

12. What is the advantage of Asymmetric key algorithm over Symmetric key algorithm ? What is Firewall ? How does Firewall resolve the security issues ? What are different types of attack that can be taken into account to protect the system ? What are the advantages of Go-Back-N ARQ over Stop-and-Wait ARQ ? What is the different between TCP and UDP ? 3 + 4 + 3 + 3 + 2

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