

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

2013

COMPUTER NETWORKING

Hours

Full Marks : 70

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)

Choose the correct alternatives for any ten of the following :

$10 \times 1 = 10$

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 |

(i) 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 |

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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 :

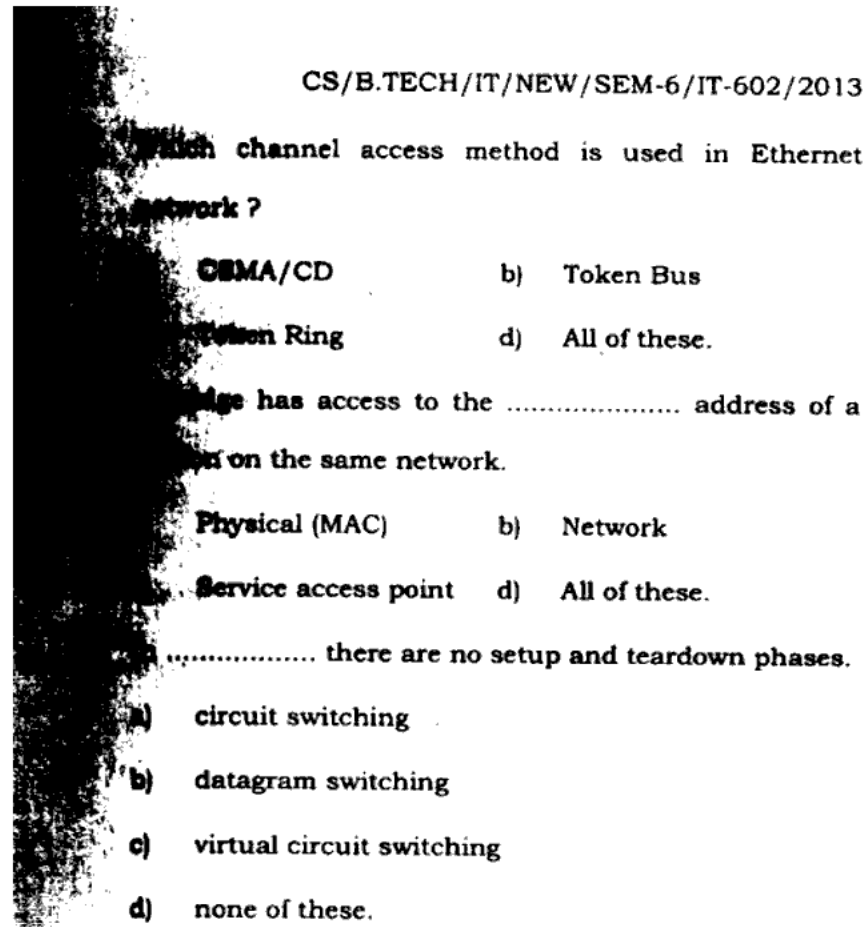
- | | |
|---------|------------------|
| A. DNS | 1. Name service |
| B. FTP | 2. File sharing |
| C. NFS | 3. File transfer |
| D. SMTP | 4. Mail service. |

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.



Which channel access method is used in Ethernet network ?

- a) CSMA/CD b) Token Bus
- c) Token Ring d) All of these.

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.

..... 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 $3 \times 5 = 15$

2. a) In HDLC, what is bit stuffing and why is it needed ?
b) What is the minimum window size required for Go-Back-N ARQ protocol and how ?

- 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
- Draw the signal for the bit pattern 010011010 for Differential Manchester encoding technique. 2
- Find the CRC for the 10 bit sequence 1001010110 and a divisor 1011.
- What is a peer to peer process ? What is the difference between model and TCP/IP model ? We have a channel with bandwidth. The SNR for this channel is 63. What is appropriate bit rate and signal level ? $1 + 2 + 2 = 5$
- 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. $2 + 3 = 5$

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

- 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 host 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 ?

- d) Explain the Leaky Bucket algorithm for Congestion control.
8. a) The code 11110101101 was received. Using Hamming encoding algorithm, what is the original code sent ?
- 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 extra frames to be transmitted to the receiver.
- 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 ?
- d) What is the primary difference between RIP and BGP ? What is the value of infinity in case of RIP ?
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

- What is the purpose of masking ?
- IP has a block of 1024 addresses. It needs to divide addresses among 1024 customers. Does it need masking ? Explain your answer.
- Advantages of ICMP and IGMP over the IPv4.
- Transparent bridge ? How does a repeater work ? What is the length of a LAN ? 3 + 3 + 5 + 4
- Advantages of optical fibre over twisted-pair and coaxial ? Give an example for each class of unguided propagation ?
- Why is DNS required ? What is the disadvantage of DNS ? Give the details of HDLC frame format.
- What is the purpose of NAT ? 3 + 2 + 2 + 2 + 3 + 3
- Advantage of Asymmetric key algorithm over symmetric key algorithm ? What is Firewall ? How does Firewall resolve the security issues ? What are different types of Firewall ? What can be taken into account to protect the network ?
- What are the advantages of Go-Back-N ARQ over Stop-and-Wait ARQ ? What is the difference between TCP and UDP ? 3 + 4 + 3 + 3 + 2
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