

CS/B.TECH/EE (NEW)/SEM-7/EE-705 A/2013-14

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2013

COMPUTER NETWORKS

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 × 1 = 10

i) A hub is a

- | | |
|-------------|------------------|
| a) router | b) bridge |
| c) repeater | d) all of these. |

ii) If subnet mask is 255.255.252.0 then how many subnets is available ?

- | | |
|------|--------|
| a) 2 | b) 18 |
| c) 4 | d) 24. |

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iii) Flow control in OSI reference model is performed in

- | | |
|--------------------|-----------------------|
| a) Data link layer | b) Network layer |
| c) Session layer | d) Application layer. |

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

- | |
|-----------------------------|
| a) Remote login |
| b) File transfer and access |
| c) Mail service |
| d) all of these. |

v) PPP is a oriented protocol.

- | | |
|----------|-------------------|
| a) phase | b) bit |
| c) byte | d) none of these. |

vi) Which of the following is an interior routing protocol ?

- | | |
|--------|----------------------|
| a) RIP | b) OSPF |
| c) BGP | d) both (a) and (b). |

vii) Checksum is used for

- | | |
|------------------------|----------------------|
| a) error detection | b) error correction |
| c) error encapsulation | d) both (a) and (b). |

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- viii) When host knows its IP address but not its physical address, it can use
- | | |
|---------|----------|
| a) RARP | b) ICMP |
| c) ARP | d) IGMP. |
- ix) Which of the following is a valid host for network 192.168.10.32/28 ?
- | | |
|------------------|-------------------|
| a) 192.168.10.39 | b) 192.168.10.47 |
| c) 192.168.10.14 | d) 192.168.10.54. |
- x) Which class of IP address is reserved for multicast communication ?
- | | |
|------------|-------------|
| a) Class A | b) Class B |
| c) Class C | d) Class D. |

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

- What is the minimum window size required for selective repeat ARQ protocol and how ?
- What do you mean by Data transparency ? What is Bit stuffing in HDLC ? Why bit stuffing is needed ?

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- Draw the following encoding schemes for the bit stream 001110101 :
 - NRZ-I
 - Manchester coding
 - Differential Manchester coding.
- Applying CRC algorithm, determine the check sum and the transmitted frame for the bit stream 11010111 and for the generator polynomial $x^3 + x^2 + 1$.
- What is Bit Rate ? What is Baud Rate ?

An analog signal carries 4 bits in each signal unit. If 1000 signal units are sent per second, find the baud rate and bit rate.

GROUP - C

(Long Answer Type Questions)

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

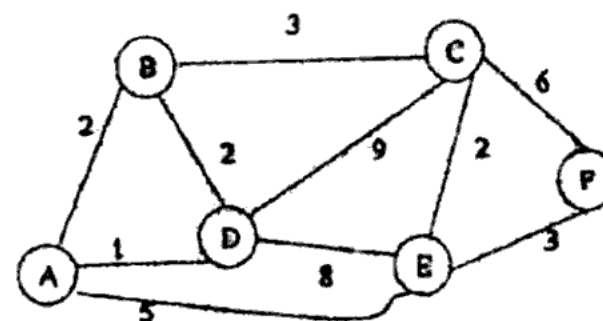
- State the difference between IPV4 and IPV6. Discuss IPV6 packet format.
 - "TCP and UDP" - which one is better ? Justify your answer.

- c) What is the purpose of subnetting ? Find the netid and the hostid of the following IP addresses :
- 19.34.21.5
 - 220.34.8.9
- d) A network has subnet mask 255.255.255.224. Determine the maximum number of Host in this network. Determine the broadcast address of the network.
- 4 + 3 + 3 + 5
8. a) What do you understand by message security ? Explain the following terms :
- User Authentication
 - Key management
 - Security protocols.
- b) How can Authentication, Integrity and Non-Repudiation be implemented by digital signature ?
- c) Explain RSA algorithm with an example.
- 7 + 3 + 5
9. a) Write down the advantages of Fibre-optic cable over twisted pair and coaxial cables.
- b) Suppose that a signal has 2^n times the power as a noise signal that is added to it. Find the SNR in decibels.

- c) A 10 bit data bit block 011101010111 is to be set using hamming code for error detection and correction. Show how the receiver corrects an error that occurs in 6th bit position from right.
- d) What is transmission impairment ? How many types of transmission impairments are there ? Discuss them.

3 + 2 + 5 + 5

10. a) What is autonomus system (AS) ? What is the difference between intradomain and Inter domain AS ? Explain an Interdomain routing protocol.
- b) What is the difference between RIP and OSPF ?
- c) Apply Dijkstra algorithm to find the shortest path from node A to node F of the network graph shown in figure below. Do the same for Bellman-Ford algorithm.



6 + 3 + 6

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11. Write short notes of any *three* of the following : 3×5

- a) Firewall
 - b) Circuit switching
 - c) DNS
 - d) QoS in transport layer
 - e) Socket.
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