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## Seventh Semester B.E. Degree Examination, Dec.2013/Jan.2014

**Computer Communication Networks**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting at least TWO questions from each part.**

**PART – A**

- 1 a. How do the layers of TCP/IP model correlate to the OSI model? (08 Marks)
- b. Explain about  $I \times Cs$  with a schematic. What are Point of presence? (06 Marks)
- c. How ADSL could achieve higher data rate over existing local loops? Explain DSLAM. (06 Marks)
- 2 a. With a frame format, give an elaborate account on HDLC. (08 Marks)
- b. What is ARQ? Describe in detail about Go-Back-N ARQ. (08 Marks)
- c. Explain Bit Stuffing with an example. (04 Marks)
- 3 a. With a flow diagram, explain CSMA/CD. (08 Marks)
- b. What is channelization? Give a brief account on CDMA. (08 Marks)
- c. What are the reasons for poor channel utilization in ALOHA systems? How the same is improved in CSMA? (04 Marks)
- 4 a. What are the reasons for not implementing CSMA/CD in wireless LANs? With a flowchart and frame exchange time line diagram, explain CSMA/CA. (08 Marks)
- b. What are the advantages of having a Bridged Ethernet? (06 Marks)
- c. List goals of the Fast Ethernet. Enumerate Fast Ethernet implementations. (06 Marks)

**PART – B**

- 5 a. List different connecting devices on the basis of layers they operate. (04 Marks)
- b. Discuss about looping problem in transparent bridges. How spanning trees help avoid looping problem? (08 Marks)
- c. What are virtual LANs? What is the basis for membership in VLAN? Enumerate advantages of having VLANs. (08 Marks)
- 6 a. Write a detailed account on IPv6 addresses. Expand the address 0:15::1:12:1213. (10 Marks)
- b. Explain fields pertaining to Fragmentation in IPv4 header. (06 Marks)
- c. In an IPv4 packet the value of HLEN is 5 and the value of the total length field is  $0 \times 0028$ . How many bytes of data are being carried by this packet? (04 Marks)
- 7 a. Compare multicasting and multiple unicasting. Discuss multicast distance vector routing. (10 Marks)
- b. What are autonomous systems? Categorize autonomous systems. Give a brief note on BGP sessions. (06 Marks)
- c. Mention the different fields in a typing routing table. What are the significance of Flags filed? (04 Marks)
- 8 a. Explain connection establishment and connection termination in TCP. (10 Marks)
- b. Give user datagram format. List uses of UDP. (06 Marks)
- c. What s FQDN? What is the need for DDNS? (04 Marks)

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Seventh Semester B.E. Degree Examination, Dec.2013/Jan.2014

## Computer Communication Networks

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- 1
  - a. Explain the OSI reference model with a neat block diagram. (10 Marks)
  - b. Differentiate between connection oriented and connectionless services. (04 Marks)
  - c. Explain briefly about LAN and WAN networks. (06 Marks)
- 2
  - a. Explain briefly the optical transmission system. State any four advantages of fiber cables over copper cables. (08 Marks)
  - b. What is Shannon's formula for maximum data rate of a noisy channel? If channel bandwidth is 3000 Hz and signal-to-noise ratio is 30 dB, calculate the maximum data rate. (03 Marks)
  - c. What are the major components in the telephone system? (03 Marks)
  - d. Compare circuit switching and packet switching. (06 Marks)
- 3
  - a. Define flow control and state two ways of achieving flow control in the data link layer. (04 Marks)
  - b. Explain byte stuffing and bit stuffing with an example for each. (06 Marks)
  - c. A receiver receives the CRC code word 1000110. The generator polynomial is  $x^3 + x + 1$ . Find out whether the message encountered any error during transmission. (04 Marks)
  - d. Explain simplex stop and wait protocol using sending site and receiving site algorithms. (06 Marks)
- 4
  - a. Explain the three persistence methods in CSMA. (09 Marks)
  - b. Compare throughput values for pure ALOHA and slotted ALOHA. (04 Marks)
  - c. Explain IEEE802.3 frame format with a neat diagram. (07 Marks)
- 5
  - a. Explain the distance vector routing algorithm. Explain the count-to-infinity problem in distance vector routing by considering a five node (linear) subnet as shown in Fig.Q5(a), where the distance metric is number of hops. Assume that 'S' is down after initial setup.
 

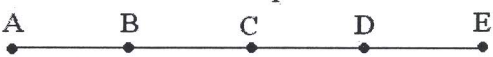


Fig.Q5(a)

 (06 Marks)
  - b. State the congestion prevention policies in the data link, network and transport layers. (06 Marks)
  - c. What are the primary parameters that determine the QoS of a flow? (04 Marks)
  - d. Explain leaky bucket algorithm. (04 Marks)
- 6
  - a. Draw the IP address formats and indicate the range of host addresses in classful addressing. (05 Marks)
  - b. Explain IPv4 datagram header format with a neat diagram. (10 Marks)
  - c. What are the five primitives for a simple transport service? (05 Marks)
- 7
  - a. What are the differences between TCP and UDPP header formats? (07 Marks)
  - b. Describe DNS name space with a figure indicating the domains. (08 Marks)
  - c. Explain the five basic functions of an email-system. (05 Marks)
- 8
 

Write short notes on the following:

a. ATM reference model	b. Gigabit Ethernet
c. Network address translation	d. 802.11 physical layer techniques

(20 Marks)

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**Seventh Semester B.E. Degree Examination, June/July 2013**  
**Computer Communication Networks**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer FIVE full questions, selecting  
at least TWO questions from each part.**

**PART - A**

- 1 a. Explain briefly with relevant examples, the four levels of addresses that are used in an internet employing the TCP/IP protocols. (10 Marks)
- b. Briefly describe the functions of physical layer and data link layer. (06 Marks)
- c. Explain the operation of ADSL using 'Discrete Multitone Technique' indicating the different channels, with a diagram. (04 Marks)
- 2 a. Explain the mechanism of selective repeat ARQ with diagram showing send window and receive window. (10 Marks)
- b. With suitable block diagram, explain the stop and wait protocol, for noise less channels. Also write the sender site algorithm. (06 Marks)
- c. Perform bit stuffing and unstuffing on the given bit stream: 0001111111001111101000. Assume flag as 01111110. (04 Marks)
- 3 a. Explain how collisions are avoided through use of 'IFS, contention window and acknowledgments' in CSMA/CA. With the help of the flow chart show the procedure for CSMA/CA. (10 Marks)
- b. Explain 'Token Passing' method of controlled access of the channel. (06 Marks)
- c. A slotted ALOHA network transmit 200 bit frames using a shared channel with a 200 kbps bandwidth. Find the throughput if the system produces i) 1000 frames per second ii) 500 frames per second iii) 250 frames per second. (04 Marks)
- 4 a. List the goals of fast Ethernet. Explain the features of physical layer in fast Ethernet. (10 Marks)
- b. Explain two different kinds of services as defined in IEEE 802.11. (06 Marks)
- c. Write a note on Piconet and Scatternet in Bluetooth. (04 Marks)

**PART - B**

- 5 a. A system with four LANs and five bridges is shown in Fig.Q5(a). Choose B1 as the root bridge. Show the forwarding and blocking ports, after applying the spanning tree procedure.

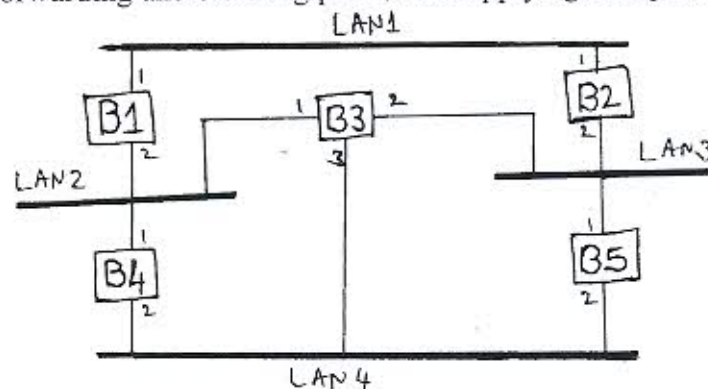


Fig.Q5(a)

(10 Marks)

- b. Define repeater, bridge and router with necessary diagrams. (06 Marks)
- c. Differentiate between a bus backbone network and star backbone network. (04 Marks)
- 6 a. An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks of 2600 customers as follows:
- The first group has 200 medium size business; each needs 16 addresses.
  - The second group has 400 small business; each needs 8 addresses.
  - The third group has 2000 households; each needs 4 addresses.
- Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations. (10 Marks)
- b. Explain briefly strategies used to handle the transition from IPv4 to IPv6. (06 Marks)
- c. A block of addresses is granted to a small organization. One of the addresses is 205.16.37.39/28. What is the first address, last address and number of address in the block. (04 Marks)
- 7 a. Explain the 'Distance Vector Routing' for the following example shown in Fig.Q7(a).

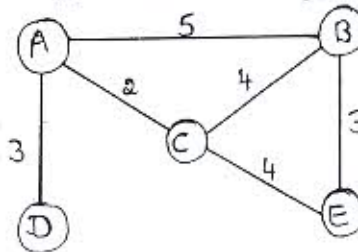


Fig.Q7(a)

- (10 Marks)
- b. Briefly discuss the following forwarding techniques:
- Next-Hop method versus Route method
  - Network-specific method versus Host specific method.
- (06 Marks)
- c. Distinguish between multicasting and multiple unicasting. (04 Marks)
- 8 a. Explain connection establishment and connection termination in TCP. (10 Marks)
- b. Write a note on DNS. (06 Marks)
- c. Write a short note on source port number and destination port number in user datagram. (04 Marks)

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**Seventh Semester B.E. Degree Examination, December 2012**  
**Computer Communication Networks**

Time: 3 hrs.

Max. Marks:100

*Note: Answer FIVE full questions, selecting  
at least TWO questions from each part.*

**PART – A**

- 1 a. Describe the ISO OSI reference model of a computer Network. Discuss the function of each layer. (10 Marks)
- b. Describe the SS7 service and its relation to the telephone network. (05 Marks)
- c. Distinguish between a DSL modem and a DSLAM. (05 Marks)
- 2 a. Differentiate between character stuffing and bit stuffing with examples. (05 Marks)
- b. Explain different HDLC frames. (05 Marks)
- c. What are sliding window protocols? Explain Go-Back-N protocol for Noisy channel. (10 Marks)
- 3 a. Compare pure ALOHA with slotted ALOHA. What are the reasons for poor channel utilization in ALOHA systems? How the same is improved in CSMA. (08 Marks)
- b. Discuss the concepts of  
i) 1 – persistent CSMA      ii) Non-persistent CSMA. (06 Marks)
- c. Explain the working of CSMA/CD. Suppose a point to point link is set up between earth and a rover on MARS. The distance from earth to mars is approximately 55 Gm and data travels over the link at a speed of light  $3 \times 10^8$  m/s. calculate the minimum round trip propagation time. (06 Marks)
- 4 a. Compare the data rates for standard Ethernet, fast Ethernet, Gigabit Ethernet and Ten Gigabit Ethernet. (04 Marks)
- b. What is the difference between a unicast, multicast, and broad cast address? Define the type of the following destination addresses:  
i) 4A : 30 : 10 : 21 : 10 : 1A  
ii) 47 : 20 : 1B : 2E : 08 : EE  
iii) FF : FF : FF : FF : FF : FF (08 Marks)
- c. Explain the following with respect to FAST Ethernet:  
i) Implementation   ii) Encoding   iii) 100 BASE-TX   iv) 100 BASE-FX. (08 Marks)

**PART – B**

- 5 a. Explain the following connecting devices:  
i) Repeater   ii) Bridge   iii) Router   iv) Gateway. (08 Marks)
- b. What is spanning tree? Explain with suitable example. (08 Marks)
- c. What is VLAN? Explain. (04 Marks)

- 6 a. Explain the address formats for IPV4 and IPV6 address? (08 Marks)  
b. List the classes in classful addressing and define the application of each class. (08 Marks)  
c. What is NAT? How can NAT help in address depletion? (04 Marks)
- 7 a. What is the difference between a direct and an indirect delivery? (04 Marks)  
b. List and explain three forwarding techniques. (08 Marks)  
c. Explain dynamic routing table. (08 Marks)
- 8 a. Compare the TCP header and the UDP header. List the fields in the TCP header that are missing from UDP header. Give the reason for their absence. (08 Marks)  
b. What are the three domains of domain name space? Explain. (08 Marks)  
c. How does recursion resolution differ from iterative resolution? (04 Marks)

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**Seventh Semester B.E. Degree Examination, June 2012**  
**Computer Communication Networks**

Time: 3 hrs.

Max. Marks:100

**Note: 1. Answer FIVE full questions.**  
**2. Missing data may suitably assumed.**

- 1
  - a. How the packets are sent in a simple client server interaction on a connection oriented network? Explain with diagram. (08 Marks)
  - b. Give a comparison of OSI and TCP/IP reference model. (06 Marks)
  - c. Give a comparison of optical fibre and copper wire as media of communication. (06 Marks)
- 2
  - a. Explain the operation of ADSL using DMT. With diagram, explain ADSL equipment. (10 Marks)
  - b. Give the electromagnetic spectrum and its uses for communication. (07 Marks)
  - c. Television channels are 6 MHz wide. How many bits/sec can be sent if four-level digital signals are used? Assume a noiseless channel. (03 Marks)
- 3
  - a. For a given message  $M = 1010001101$  with pattern  $P = 110101$ , find the frame check sequence and give the resulting frame to be transmitted. Find the errors in the received message. (08 Marks)
  - b. With diagram, explain sliding window protocol. (06 Marks)
  - c. A channel has a bit rate of 4 kbps and a propagation delay of 20 m sec. For what range of frame size does stop and wait give an efficiency of atleast 50%? (06 Marks)
- 4
  - a. Compare pure ALOHA and slotted ALOHA. (08 Marks)
  - b. With diagram explain MACA protocol. (06 Marks)
  - c. A group of N stations share a 56 kbps pure ALOHA channel. Each station outputs a 1000 bit frame on an average of once in every 100 sec. What is the maximum value of N? (06 Marks)
- 5
  - a. What are the advantages of link state routing? Explain the different stages involved in link state routing. (08 Marks)
  - b. Give the header format of IPV<sub>4</sub> and IP address format. (06 Marks)
  - c. With diagram, explain the operation of NAT. (06 Marks)
- 6
  - a. Explain transport service primitives. (07 Marks)
  - b. Explain TCP connection establishment in normal case and in case collision. (06 Marks)
  - c. What are two army problems? How it can be overcome? (07 Marks)
- 7
  - a. Explain how a resolver looks up a remote name. (06 Marks)
  - b. Explain RFC822 header fields related to message transport. (06 Marks)
  - c. With example explain reverse path forwarding algorithm. (08 Marks)
- 8
 

Write short notes on :

  - a. UDP
  - b. Bluetooth architecture
  - c. Bridges from 802.x to 802.y
  - d. Gigabit Ethernet. (20 Marks)

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**Seventh Semester B.E. Degree Examination, December 2011**  
**Computer Communication Networks**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting  
atleast TWO questions from each part.**

**PART – A**

- 1 a. Explain the differences between OSI reference model and TCP /IP reference model. (05 Marks)
- b. Match the following to one or more layers in OSI model : (05 Marks)
  - i) Route determination
  - ii) Flow control
  - iii) Interface to transmission media
  - iv) Provides access for the end user
  - v) Format and code conversion services.
- c. What is DSL technology? What are the services provided by the telephone companies using DSL? Distinguish between DSL and DSLAM. (10 Marks)
- 2 a. In stop and wait ARQ system, the bandwidth of the line is 1Mbps and it takes 20 ms to make round trip. What is the bandwidth delay product? If the system data frames are of 1000 bit length, what is the utilization percentage of link? What is the channel utilization percentage of link if the protocol that can send up to 15 k rnes before stopping and worrying about the acknowledgement? Write the comment. (05 Marks)
- b. Explain briefly the bit and charter stuffing. (05 Marks)
- c. With a neat diagram, explain the HDLC frame form. (10 Marks)
- 3 a. Write the different physical topologies used in the logical ring method and explain briefly. (10 Marks)
- b. In CSMA/ CD, the data rate is 10 Mbps, the distance between the stations 'A' and 'C' is 2000 m and propagation is  $2 \times 10^8$  mts. Station A starts sending a long frame at time  $t_1 = 0$ ; station C starts sending a long frame at  $t_2 = 3$  micro sec. The size of the frame is long enough to guarantee the detection of collision by the stations.  
Find : (10 Marks)
  - i) The time when station 'C' hears the collision ( $t_3$ )
  - ii) The time when station 'A' hears the collision ( $t_4$ )
  - iii) The number of bits station A has sent before detecting the collision
  - iv) The number of bits station C has sent before detecting the collision.
- 4 a. Mention the four different types of Ethernet format. Explain the same briefly. (10 Marks)
- b. List the different goals of giga bit Ethernet and explain the different implementation of same. (10 Marks)

**PART – B**

- 5 a. Why spanning tree algorithm is used? Explain the same, with a graphical representation. (10 Marks)
- b. Mention the different characteristics of VLAN and explain briefly. (10 Marks)



- 6 a. Find the range of address in the following blocks
- 123.56.77.32/29
  - 200.17.21.128/27
  - 17.34.16.0/23
  - 180.34.64.64/30.
- b. Explain the IPV4 datagram format. (10 Marks)
- 7 a. Explain the Dijkstra algorithm for the example shown in Fig. Q7(a). (10 Marks)

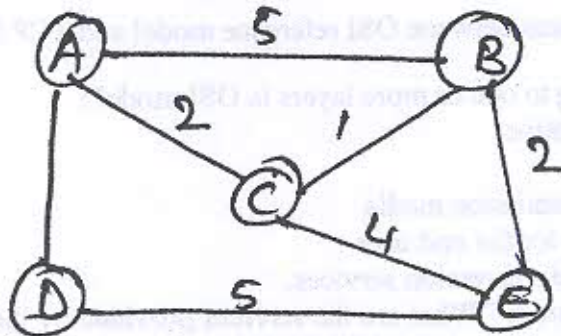


Fig. Q7(a)

- b. Explain the different forwarding techniques used to forward the packet from source to destination. (10 Marks)
- 8 a. Explain the user datagram format. (05 Marks)
- b. Explain the features of TCP. (10 Marks)
- c. Suppose a TCP connection is transferring a file of 5000 bytes, the 1<sup>st</sup> byte is numbered 10,001. What are the sequence nos of each segment, if data are sent in 5 segments each carrying 1000 bytes? (05 Marks)

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**Seventh Semester B.E. Degree Examination, June/July 2011**  
**Computer Communication Networks**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, selecting  
at least TWO questions from each part.**

**PART – A**

- 1 a. With a neat diagram, explain the TCP/IP reference model, giving a brief description of the protocols in each layer. (10 Marks)
- b. Differentiate between CM and CMTS. (04 Marks)
- c. Explain the operation of ADSL using discrete multi tone modulations indicating the different channels, with a neat diagram. (06 Marks)
- 2 a. Explain byte stuffing and unstuffing and bit stuffing and unstuffing, with necessary diagrams. (10 Marks)
- b. With a neat diagram, explain three different types of HDLC frames. (10 Marks)
- 3 a. Define random access method explain three different protocols in this category. (10 Marks)
- b. Explain reservation, polling and token passing in controlled access method. (10 Marks)
- 4 a. What are the advantages of dividing an Ethernet LAN with a bridge? Explain with a neat diagram. (06 Marks)
- b. Compare the data rates for standard, fast, gigabit and ten-gigabit Ethernet. Mention one example in each case. (04 Marks)
- c. Explain DCF and PCF modes of 802.11 MAC protocol. (10 Marks)

**PART – B**

- 5 a. Define repeater, hub, switch, router and gate way with necessary neat diagrams. (10 Marks)
- b. Create a system of three LANs with four bridges. The bridges (B1 to B4) connect the LANs as follows :
  - i) B1 connects LAN1 and LAN2
  - ii) B2 connects LAN1 and LAN3
  - iii) B3 connects LAN2 and LAN3
  - iv) B4 connects LAN1, LAN2 and LAN3.
 Choose B1 as the root bridge. Show the forwarding and blocking parts, after applying the spanning tree procedure. (10 Marks)
- 6 a. Distinguish between class A, class B and class C addressing. (06 Marks)
- b. What is subnetting? Why it is required? What is the maximum number of subnets in class C networks with the following subnet mask?
  - i) 255.255.255.0
  - ii) 255.255.255.224
  - iii) 255.255.255.248. (06 Marks)
- c. Explain IPV4 header format. (08 Marks)
- 7 a. With necessary diagrams, explain distance vector routing. (10 Marks)
- b. Explain briefly forwarding techniques. Explain three different forwarding techniques. (10 Marks)
- 8 a. Explain connection establishment and connection termination in TCP. (10 Marks)
- b. Describe DNS in the internet. (10 Marks)



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**Seventh Semester B.E. Degree Examination, June/July 2011**  
**Computer Communication Networks**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**

- 1
  - a. Discuss the various advantages and applications of computer network. (04 Marks)
  - b. Draw a neat diagram of ISO OSI reference model and discuss the functions of each layer. (10 Marks)
  - c. Describe the internet architecture. (06 Marks)
- 2
  - a. How is the transmission media classified? Explain. (08 Marks)
  - b. Differentiate between circuit switching message switching and packet switching with the timing of events diagram. (08 Marks)
  - c. Calculate the maximum bit rate for a channel having bandwidth 1800 Hz and S/N ratio of 30 dB. (04 Marks)
- 3
  - a. List the methods of framing. Explain bit stuffing and character stuffing. (07 Marks)
  - b. A bit stream 10011101 is transmitted using CRC method. The generator polynomial is  $x^3 + 1$ . Show the actual bit string transmitted. (06 Marks)
  - c. What are the sliding window protocols? Explain the go back N protocol. (07 Marks)
- 4
  - a. Derive an expression for throughput of pure aloha and slotted aloha and compare the same. (06 Marks)
  - b. Discuss the concepts of
    - i) 1 – persistent CSMA.
    - ii) Non – persistent CSMA.
    - iii) CSMA/CD. (09 Marks)
  - c. Describe the functioning of a switched Ethernet. (05 Marks)
- 5
  - a. Write the 802.11 data frame format and explain the different fields. (07 Marks)
  - b. Mention the types of routing algorithms and explain the shortest path routing, with suitable illustration. (10 Marks)
  - c. Convert IP address whose hexadecimal representation is C22F1582 to dotted decimal notation. (03 Marks)
- 6
  - a. What are the general principles of congestion control algorithms? Explain the leaky bucket algorithm for traffic shaping. (10 Marks)
  - b. List the five primitives for simple transport service in transport layer giving the meaning of each. (05 Marks)
  - c. What is multiplexing? Explain different types of multiplexing in transport layer. (05 Marks)
- 7
  - a. Explain the different fields in TCP header and mention the fields that are used for addressing, error control and flow control. (08 Marks)
  - b. Explain the five basic functions supported by e-mail system. (05 Marks)
  - c. Describe the basic model of a web showing the different parts of it. (07 Marks)
- 8
 

Write short notes on the following :

  - a. Bluetooth
  - b. WAN.
  - c. Hub, Bridge and Switch.
  - d. QOS parameters with respect to transport layer. (20 Marks)

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**Seventh Semester B.E. Degree Examination, December 2010**  
**Computer Communication Networks**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting  
at least TWO questions from each part.**

**PART – A**

- 1 a. What are the levels of addresses that are used in an internet, employing the TCP/IP protocols? (10 Marks)
- b. What are different types of services provided by telephone networks? (06 Marks)
- c. Name the major components of a telephone network. (04 Marks)
- 2 a. Explain the stop-and-wait protocol, for noisy channels. (10 Marks)
- b. What are the three types of frames in HDLC protocol? Explain each of them briefly. (10 Marks)
- 3 a. Explain pure ALOHA protocol. (06 Marks)
- b. Pure ALOHA network transmits 200-bit frames on a shared channel of 200 Kbps. What is the throughput if the system produces :  
i) 1000 frames/sec    ii) 500 frames/sec    iii) 250 frames/sec? (04 Marks)
- c. Discuss the three controlled access methods. (10 Marks)
- 4 a. Explain the goals, MAC sub layer and physical layer of the fast Ethernet. (10 Marks)
- b. Explain briefly the baseband layer in the Bluetooth layers. (10 Marks)

**PART – B**

- 5 a. Explain briefly the three criteria of the transparent bridge. (10 Marks)
- b. Explain virtual LANs systems. (10 Marks)
- 6 a. Find the class of the following IP addresses:  
i) 237.14.2.1  
ii) 208.35.54.12  
iii) 129.14.6.8  
iv) 114.34.2.8 (04 Marks)
- b. What is NAT? How can NAT help in address depletion? (06 Marks)
- c. Explain IPV6 addresses. (10 Marks)
- 7 a. Explain the path vector routing, for an interdomain system. (10 Marks)
- b. Explain the Core-Based Tree (CBT). (10 Marks)
- 8 Write short notes on any TWO of the following : (20 Marks)
  - a. UDP
  - b. TCP
  - c. DNS

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.



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**Seventh Semester B.E. Degree Examination, December 2010**  
**Computer Communication Network**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**

1.
  - a. Explain the TCP/IP reference model. (08 Marks)
  - b. Why does ATM use small fixed length cells? Explain ATM reference model. (08 Marks)
  - c. What are the two reasons for using layered network architecture? (04 Marks)
2.
  - a. Mention the guided and unguided transmission media. Explain the fiber optics networks. (08 Marks)
  - b. Compare the maximum data rate of a noiseless 4 KHz channel using
    - i) Analog encoding with 2-bits per sample
    - ii) The T<sub>1</sub> PCM system. (04 Marks)
  - c. Differentiate between the circuit switching and packet switching with the help of timing of events. (08 Marks)
3.
  - a. Explain the design issues of data link layer. (06 Marks)
  - b. What is piggybacking? Explain sliding window protocols. (07 Marks)
  - c. A channel has bit rate of 4 kbps and a propagation speed of 20 msec. For what range of frame size, does stop and wait give an efficiency of atleast 50 percent? (07 Marks)
4.
  - a. Measurements of slotted Aloha channel with an infinite number of users show that 10% of slots are idle.
    - i) What is the channel load G?
    - ii) What is the throughput?
    - iii) Is the channel underloaded or overloaded? (06 Marks)
  - b. Explain the ethernet MAC sublayer protocol. (06 Marks)
  - c. Describe the services of 802.11. (08 Marks)
5.
  - a. Differentiate between static and dynamic routing. Explain distance vector routing. (08 Marks)
  - b. What is congestion? What is the need of congestion control? Explain any one congestion control technique. (06 Marks)
  - c. Explain the issues of network layer design. (06 Marks)
6.
  - a. Differentiate between repeaters, hubs, bridges, switches and routers. (10 Marks)
  - b. Differentiate between IPv4 and IPv6. (06 Marks)
  - c. Convert IP address whose hexadecimal representation is C22F15B2 into dotted decimal notation. (04 Marks)
7.
  - a. Describe structure and various fields of
    - i) TCP header and
    - ii) UDP header. (08 Marks)
  - b. What is WWW? Explain the working of WWW, with the help of web model. (06 Marks)
  - c. Discuss class A and class B methods of internet addressing. Mention minimum and maximum range possible with these types of addressing. (06 Marks)
8.
 

Write short notes on :

  - a. Bluetooth technology
  - b. QOS
  - c. SMTP
  - d. Address resolver in DNS. (20 Marks)

\* \* \* \* \*

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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06EC71

**Seventh Semester B.E. Degree Examination, May/June 2010**  
**Computer Communication Networks**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting at least TWO questions from each part.**

**PART – A**

1.
  - a. Explain OSI model, with a neat block diagram. Consider a source, destination machine and some intermediate nodes for discussion. (10 Marks)
  - b. How addresses employed (used) in internet employing TCP/IP protocol can be classified? (02 Marks)
  - c. What is DSL technology? List different DSLs available. Discuss salient features of ADSL. (08 Marks)
  
2.
  - a. What is framing? How frames can be classified? Explain bit stuffing with the help of an example. (06 Marks)
  - b. What is the meaning of datalink control? Explain stop-and-wait ARQ, using a suitable block diagram. (10 Marks)
  - c. In a stop-and-wait ARQ system the bandwidth of the line is 1 Mbps and 1 bit takes 20 ms to make a round trip. What is the bandwidth delay product? If the system data frames are 1000 bits in lengths, what is the percentage utilization of the link? (04 Marks)
  
3.
  - a. A slotted ALOHA network transmits 200 bit frames using a shared channel with 200 kbps bandwidth. Find the throughput if the system produces 500 frames/sec. (03 Marks)
  - b. A network using CSMA/CD has a bandwidth of 10 Mbps. If the maximum propagation time is 25.6  $\mu$ sec, what is the minimum size of the frame? (03 Marks)
  - c. Explain token passing method of controlled access of the channel. (06 Marks)
  - d. What is channelization in the context of multiple access? What are the various available channelization techniques? List the properties of orthogonal sequences used in CDMA. (08 Marks)
  
4.
  - a. Explain 802.3 MAC frame format. (06 Marks)
  - b. An ethernet MAC sublayer receives 38 bytes of data from upper layer. How many bytes of padding must be added to the data? (02 Marks)
  - c. Explain two different kinds of services as defined in IEEE 802.11. (06 Marks)
  - d. What is fast ethernet? Explain autonegotiation. What are the purposes of using this feature in design of fast ethernet. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.



PART – B

- 5 a. What are the five different categories of connecting devices, based on the layer at which they operate in a network? Explain each of them. (10 Marks)
- b. Differentiate between a bus backbone network and star backbone network. (06 Marks)
- c. Explain the concept of VLAN, in brief. (04 Marks)
- 6 a. What is the need of transition from IPV4 to IPV6? What are the strategies devised by IETF to help the transition? (12 Marks)
- b. Find the error, if any, in the following IPV4 addresses:  
i) 75.45.301.14            ii) 221.34.7.8.20 (02 Marks)
- c. What is classless addressing in IPV4? What is a mask? Explain. (06 Marks)
- 7 a. Explain Dijkstra algorithm. Apply the same to node 'A' of the graph shown in Fig.7(a) and prepare routing table for node A. (06 Marks)

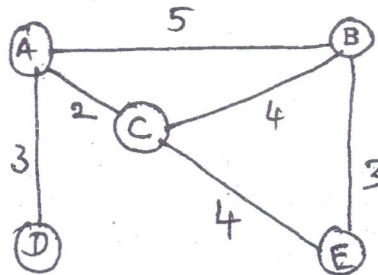


Fig.7(a) Topology of Network

- b. What is tunneling in case of multicast routing? Explain multicast backbone of routers using concept of tunneling? (06 Marks)
- c. Write in brief, any four applications of multicasting. (08 Marks)
- 8 Write short notes on any two of the following :
- a. UDP
- b. TCP segment format
- c. IPV4 datagram format. (20 Marks)

**Seventh Semester B.E. Degree Examination, Dec.09/Jan.10**  
**Computer Communication Networks**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**  
**choosing at least two full questions from each part.**

**PART-A**

- 1 a. Show the layer representation in the TCP/IP model and the OSI model and explain. (10 Marks)
- b. Give a brief overview of SS7 signaling. (05 Marks)
- c. Match the following functions to the appropriate layers in the OSI model.
  - i) Dividing the transmitted bit stream into frames.
  - ii) Determining the route to be used through the subnet.
  - iii) Reliable process to process message delivery.
  - iv) Format and code conversion services.
  - v) Accessing the World Wide Web. (05 Marks)
- 2 a. Explain the selective repeat sliding window protocol with necessary figures. (10 Marks)
- b. A channel has a bit rate of 4 kbps and a propagation delay of 20 msec. For what range of frame sizes does stop and wait protocol give an efficiency of at least 50%. (06 Marks)
- c. Perform bit stuffing on the given bit stream 0110111101111110111111010. Assume flag as 01111110. (04 Marks)
- 3 a. Explain CSMA and show the behaviour of the three persistence methods of CSMA. Compare the vulnerable times in CSMA and CSMA/CD. (10 Marks)
- b. 10,000 stations are competing for the use of a single slotted ALOHA channel. The average station makes 18 requests/hour. A slot is 125  $\mu$ sec. What is the approximate total channel load? (05 Marks)
- c. In a CDMA system the four chip sequences are :
 

A = (-1 -1 -1 +1 +1 -1 +1 +1)

B = (-1 -1 +1 -1 +1 +1 +1 -1)

C = (-1 +1 -1 +1 +1 +1 -1 -1)

D = (-1 +1 -1 -1 -1 -1 +1 -1) in bipolar form.

 If the received sequence is (-1 +1 -3 +3 +1 -1 -1 +1) what is the data transmitted by the four stations. (05 Marks)
- 4 a. Give the format for the IEEE 802.3 frame for Ethernet. What are the minimum and maximum frame lengths? (07 Marks)
- b. Identify if the following 802.3 MAC addresses are unicast, multicast or broadcast.
  - i) 47 : 20 : 1B : 2E : 08 : EE
  - ii) EE : FF : 10 : 01 : 11 : 00
  - iii) FF : FF : FF : FF : FF : FF. (03 Marks)
- c. What are the hidden and exposed station problems in wireless Lan's. Give solutions for each. (10 Marks)

**PART-B**

- 5 a. Explain each of the following in brief.
  - i) passive Hub
  - ii) repeater
  - iii) bridge
  - iv) router
  - v) gateway. (10 Marks)
- b. Give the IPV4 datagram format and explain its fields. (10 Marks)



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- 6 a. What are the differences between classful addressing and classless addressing in IPV4. (10 Marks)
- b. An ISP is granted a block of addresses starting with 190.100.0.0/16. The ISP needs to distribute these addresses to the group of customers as follows :
- First group has 64 customers, each needs 256 addresses
  - Second group has 128 customers, each needs 128 addresses
  - Third group has 128 customers, each needs 64 addresses. Design the subblocks and find out how many addresses are still available after these allocations. (10 Marks)

- 7 a. Explain the distance vector routing for the following example.

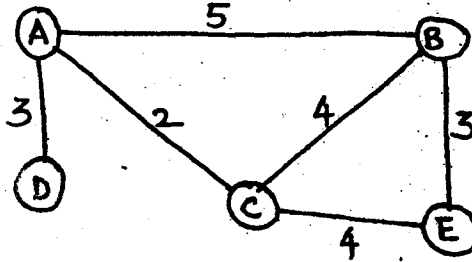


Fig. Q7(a)

- (10 Marks)
- b. Compare multicasting with multiple unicasting. Differentiate between source based tree and group shared tree approach used in multicast routing. (10 Marks)
- 8 a. Describe a TCP connection and explain a TCP connection establishment using three way handshaking. (10 Marks)
- b. Explain recursive resolution and iterative resolution in name address resolution. (10 Marks)

## Seventh Semester B.E. Degree Examination, June-July 2009

**Computer Communication Networks**

Time: 3 hrs.

Max. Marks:100

**Note:1. Answer any FIVE full questions.****2. Standard notations are used.****3. Missing data be suitably assumed.**

- 1 a. With a neat diagram explain the TCP/IP reference model, giving a brief description of the protocols in each layer. (10 Marks)
- b. Match the following to one or more of the seven OSI layers.
  - i) Ensures reliable transmission of data.
  - ii) Transportation of bits.
  - iii) Provides end-end delivery of data.
  - iv) Routes the packets across the network.
  - v) Provides Encryption/Decryption of data.
  - vi) Provides Log-in Log-out procedures. (06 Marks)
- c. Draw the constellation diagram for QPSK and QAM – 16, hence determine the bit rate for these two systems, if the baud rate is 2400 bauds. (04 Marks)
  
- 2 a. Explain the use of optical fibers as a transmission media. The explanation should include construction, operation, types of fibers and the optical bands that are used. (08 Marks)
- b. What modification of telephone line is needed to use ADSL? With a neat diagram indicating the different channels, explain the operation of ADSL using discrete multitone modulation. (08 Marks)
- c. What signal-to-noise ratio is needed to put a T1 carrier on a 50 kHz line? Comment on the result. (04 Marks)
  
- 3 a. What are the main principles in the design of sliding window protocol? Explain with a neat diagram the working of selective repeat protocol. (10 Marks)
- b. With a neat diagram explain the HDLC frame structure. (05 Marks)
- c. In a stop and wait protocol, the link can transport data at 50 kbps and the propagation delay,  $t_p$  is 100 msec. Estimate the length of frames so that the link utilization is 50%. (05 Marks)
  
- 4 a. Explain briefly the assumptions made in modeling the dynamic channel allocation. Show that for pure Aloha,  $S = Ge^{-2G}$  where S is the throughput and G is the normalized load. Plot the characteristics of G vs S and indicate stable and unstable operating points. (12 Marks)
- b. The stations of a slotted Aloha system attempt to send 100 packets / second including requests and retransmissions. The slot duration is 20 msec. It may be assumed that the attempts are independent random events with a Poisson distribution.
  - i) What is the probability that the first attempt to send a packet will be successful?
  - ii) What is the probability of exactly three collisions followed by a successful attempt?
  - iii) What is the average number of attempts per transmitted packet? (08 Marks)
  
- 5 a. With a neat diagram explain the use of Carrier Sense Multiple Access with Collision Avoidance (CSMA / CA) operation based on MACA (wireless) for distributed co-ordination function (DCF) wireless LAN networks. (08 Marks)
- b. What are bridges? Explain with a neat diagram how they can be used for internetworking. (08 Marks)
- c. With a neat diagram, differentiate between virtual circuits and datagram networks. (04 Marks)



- 6 a. What are the different steps in Link State routing? Explain briefly how the routers update their routing table using Link State packets. (14 Marks)
- b. What is congestion in networks? Explain briefly any one method of congestion control in datagram networks. (06 Marks)
- 7 a. Distinguish between Class A, Class B and Class C addressing. (06 Marks)
- b. What is subnetting and why it is required? What is the maximum number of subnets in Class C networks with the following subnet mask:
- i) 255.255.255.0
  - ii) 255.255.255.224
  - iii) 255.255.255.248 (06 Marks)
- c. Explain with a neat diagram, a three way hand-shake to set up a TCP connection. (08 Marks)
- 8 a. With reference to TCP header explain:
- i) Source port and destination port.
  - ii) Sequence / Acknowledgement number.
  - iii) Flags URG, ACK, PSH, RST, SYN, FIN (09 Marks)
- b. Explain the architectural features of World Wide Web (WWW) and the use of browser, web pages, hypertext, hyperlinks and Uniform Resource Locator (URL). (11 Marks)

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## Seventh Semester B.E. Degree Examination, Dec.08/Jan.09

**Computer Communication Network**

Time: 3 hrs.

Max. Marks:100

**Note : Answer any FIVE full questions.**

- 1
  - a. Differentiate between the following :
    - i) Presentation and Application layer. (06 Marks)
    - ii) Bus and Ring topologies. (06 Marks)
    - iii) LAN and WAN. (08 Marks)
  - b. Explain 'Multimedia' transmission over internets. (06 Marks)
  - c. Discuss the features of SONET network and advantages offered by it. (08 Marks)
  
- 2
  - a. What is meant by 'Ethernet'? Explain its main features. (05 Marks)
  - b. Explain ATM reference model. (05 Marks)
  - c. Differentiate between FDM, TDM and WDM. (06 Marks)
  - d. T<sub>1</sub> carrier transmission is done over a network. What percentage of total bandwidth is used for overhead transmission? (04 Marks)
  
- 3
  - a. Describe flow control mechanism adopted in data link layer. (06 Marks)
  - b. Explain the frame format of a bit oriented protocol. (10 Marks)
  - c. A 12 – bit Hamming code whose hexadecimal value in 0 x B4F arrives at a receiver. What was original data in hexadecimal? (04 Marks)
  
- 4
  - a. Explain in detail one bit sliding window protocol. (07 Marks)
  - b. Describe the use of pipelining techniques in data link layer protocols for receivers having window size > 1. (08 Marks)
  - c. A 3000 km long T<sub>1</sub> trunk is used to transmit 64 byte frames using 'Go back N' protocol. If propagation speed is 6 μ sec/km, how many bits should the sequence number be? (05 Marks)
  
- 5
  - a. Describe the different CSMA techniques employed in MAC layer. (06 Marks)
  - b. Describe the 802.11 MAC sublayer protocol. (08 Marks)
  - c. Define : i) Repeater. ii) Bridges. iii) Gateways. (06 Marks)
  
- 6
  - a. Compare and contrast VC and datagram subnets. (06 Marks)
  - b. With an example, describe Bellman – Ford routing algorithm. What are its serious drawbacks? (10 Marks)
  - c. For hierarchical routing with 4800 routers, what region and cluster sizes should be chosen to minimize the size of the routing table for a three layer hierarchy? (04 Marks)
  
- 7
  - a. Define QoS. Describe the QoS parameters defined for computer networks. (06 Marks)
  - b. Explain with neat figures, leaky bucket algorithm. (06 Marks)
  - c. With a neat diagram, explain IP version 4 header format. (08 Marks)
  
- 8
  - a. With neat diagrams, explain and compare the UDP with TCP header. (10 Marks)
  - b. Describe transport service primitives used in TCP services. (10 Marks)



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**Seventh Semester B.E. Degree Examination, May / June 08**  
**Computer Communication Networks**

Time: 3 hrs.

Max. Marks:100

**Note : Answer any FIVE full questions.**

- 1
  - a. Differentiate between TCP /IP and OSI model. (04 Marks)
  - b. Explain the working of internet by using a neat diagram of internet architecture. (08 Marks)
  - c. A dog is trained to carry a box of five 8 mm tapes. Each tape contains 10 gigabytes. The dog can travel to your side, wherever you are at 20 km /hour. For what range of distance does dog have a higher data rate than a transmission line whose data rate is 150 Mbps? (08 Marks)
  
- 2
  - a. Define the following with examples :
    - i) Bit rate
    - ii) Baud rate
    - iii) Nyquist maximum data rate
    - iv) Shanon's data rate. (08 Marks)
  - b. Differentiate between circuit and packet switching. (06 Marks)
  - c. Ten signals, each requiring 4000 Hz are multiplexed on to a single channel using FDM. How much minimum band width is required for multiplexed channel? Assume Guard bands are 400 Hz wide. (06 Marks)
  
- 3
  - a. Why bit stuffing is needed in bit oriented protocols? Explain with an example. (06 Marks)
  - b. Explain one bit sliding window protocol with neat illustrations. (06 Marks)
  - c. Frames of 1000 bits are sent over a 1 Mbps channel using a geostationary satellite whose propagation time from earth is 270 m sec. Acknowledgements are always piggybacked into data frames. Headers are very short. 3 bit sequence numbers are used. What is minimum achievable channel utilization for stop – and – wait and window protocol? (08 Marks)
  
- 4
  - a. Derive an expression for through put of pure and slotted ALOHA. (06 Marks)
  - b. Explain binary exponential backoff algorithm used in Ethernet. (06 Marks)
  - c. Describe distributed and centralized MAC access in 802.11 WLANS. (08 Marks)
  
- 5
  - a. Describe Bellman –ford routing algorithm using an example. (08 Marks)
  - b. Explain leaky bucket algorithm used for traffic shaping. (06 Marks)
  - c. What is subnetting? Why is it required? Explain with an example. (06 Marks)
  
- 6
  - a. Explain connection establishment in TCP. (06 Marks)
  - b. A TCP machine is sending full windows of 65, 535 bytes over a 1 Gbps channel that has 10 m sec one way delay. What is maximum achievable throughput? What is line efficiency? (06 Marks)
  - c. Explain window management in TCP. Describe Nagle's algorithm when byte by byte transfer is done over the network. (08 Marks)
  
- 7
  - a. Describe DNS name space. (08 Marks)
  - b. Describe the web model. (08 Marks)
  - c. What is bit rate for transmitting uncompressed 800 × 600 pixel color frames with 8 bits /pixel at 40 frames /sec. (04 Marks)
  
- 8
  - Write short notes on any FOUR :
    - a. Classful addressing
    - b. Bluetooth
    - c. Link state routing
    - d. QOS
    - e. SMTP. (20 Marks)

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**Seventh Semester B.E. Degree Examination, Dec. 07 / Jan. 08**  
**Computer Communication Networks**

Time: 3 hrs.

Max. Marks:100

Note : Answer any FIVE full questions.

- 1 a. List the differences between:
  - i) Connection oriented and connectionless communication. (05 Marks)
  - ii) Services and protocols. (05 Marks)
  - iii) OSI and TCP/IP (04 Marks)
- b. What are the principles that were applied to arrive at the seven layers? (06 Marks)
- c. Explain in brief the four main applications of Internet and its predecessors. (05 Marks)
- d. Explain the ATM reference model. (06 Marks)
  
- 2 a. Explain the following:
  - i) Twisted pair (05 Marks)
  - ii) Radio transmission. (05 Marks)
- b. State the advantages of fiber optics over copper wires. (06 Marks)
- c. Compare circuit switched network with packet switched network. (04 Marks)
- d. A telephone system consists of two end offices and a single toll office to which each end office is connected by a 1 MHz full-duplex trunk. The average telephone is used to make four calls per 8-hour workday. The mean call duration is 6 min. Ten percent of the calls are long-distance (i.e. pass through the toll office). What is the maximum number of telephones an end office can support? (Assume 4 kHz per circuit). (07 Marks)
  
- 3 a. List the methods of framing. Explain Byte stuffing and Bit stuffing. (05 Marks)
- b. A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is  $x^3 + 1$ . Show the actual bit string transmitted. Assume that the third bit from the left is inverted during transmission. Show that this error is detected at receiver's end. (08 Marks)
- c. Explain the effect of pipelining on error recovery.
  - i) When receiver's window size is one. (05 Marks)
  - ii) When receiver's window size is large. (10 Marks)
  
- 4 a. Give the frame format for bit oriented protocols. Explain. (05 Marks)
- b. Explain the five key assumptions for dynamic channel allocation in LANS and MANS. (05 Marks)
- c. Explain the five distribution services that are provided by the base stations according to 802.11 standard. (05 Marks)
  
- 5 a. Explain how store and forward switches have an advantage over cut-through switches with respect to damaged frames. (02 Marks)
- b. Compare virtual circuit subnet with the datagram subnet. (06 Marks)
- c. Mention the types of routing algorithm. Explain the link state routing. (12 Marks)
  
- 6 a. Explain the policies that affect congestion in the network layer. (04 Marks)
- b. List the techniques, the system designers use to achieve good quality of service. Explain the leaky bucket algorithm. (10 Marks)
- c. Explain the IPV4 header format. (06 Marks)
  
- 7 a. Explain (CIDR) Classless Inter Domain Routing. (05 Marks)
- b. Explain the five primitives for a simple transport service. (05 Marks)
- c. Explain the UDP and TCP header. (10 Marks)
  
- 8 a. Explain the connection establishment and connection release in TCP. (05 Marks)
- b. Explain the five basic functions that email system support. (05 Marks)
- c. List the principal header fields related to message transport. Explain. (10 Marks)



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<b>NEW SCHEME</b>
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**Seventh Semester B.E. Degree Examination, May 2007**  
**Electronics and Communication Engineering**  
**Computer Communication Networks**

Time: 3 hrs.]

[Max. Marks:100

**Note : Answer any FIVE full questions.**

- 1
  - a. Describe the ISO OSI reference model of a computer network. Discuss the function of each layer. (10 Marks)
  - b. Explain ATM reference model with a neat diagram. (06 Marks)
  - c. Suppose a point to point link is set up between earth and a rover on mars. The distance from earth to mars is approximately 55 Gm and data travels over the link at a speed of light  $3 \times 10^8$  m/s. Calculate the minimum roundtrip propagation time. (04 Marks)
- 2
  - a. How the transmission media is classified? Discuss various varieties of twisted pair cable. (06 Marks)
  - b. What is local loop? Explain how a medium distance call be routed in a telephone system with the help of schematic diagram. (10 Marks)
  - c. Calculate the maximum bitrate for a channel having bandwidth 1800 Hz and S/N ratio 30 dB. (04 Marks)
- 3
  - a. Suppose we want to transmit the message 1 1 0 1 0 1 1 0 1 1 and protect it from errors using the CRC polynomial 1 0 0 1 1. Determine the message that should be transmitted. Suppose the leftmost bit of the message is inverted due to noise on transmission link, what is the result of the receivers CRC calculation? How does the receiver know that an error has occurred? (10 Marks)
  - b. What is pipelining? Explain selective repeat protocol. How does it differ from go back n protocol. (10 Marks)
- 4
  - a. What are Pico net and scatter net in blue tooth? (05 Marks)
  - b. Explain vulnerable period in pure ALOHA. (05 Marks)
  - c. Discuss various types of Ethernet cabling. (06 Marks)
  - d. What are the differences between persistent and non persistent CSMA? (04 Marks)
- 5
  - a. Discuss the principle of optimality. Explain link state routing. (10 Marks)
  - b. Explain how IP addresses are assigned. Find the class of each address.  
 i) 75.45.301.14 ii) 221.34.7.82 iii) 14.23.120.8 iv) 252.5.15.111 (10 Marks)
- 6
  - a. Compare Leaky bucket and Token bucket algorithm. (05 Marks)
  - b. Explain one bit sliding window protocol with normal case and abnormal case. (08 Marks)
  - c. Explain reverse path forwarding. What are its advantages? (07 Marks)
- 7
  - a. What are transport service primitives? Explain the primitives for a simple transport service. (06 Marks)
  - b. Explain four protocol scenarios for releasing a connection in TCP. (08 Marks)
  - c. What is multiplexing? Explain different types of multiplexing in transport layer. (06 Marks)
- 8 Write short notes on :
  - a. E-mail
  - b. WAN
  - c. Packet switching
  - d. TDM. (20 Marks)



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<b>NEW SCHEME</b>
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**Seventh Semester B.E. Degree Examination, Dec.06 / Jan.07**  
**Electronics & Communication Engineering**  
**Computer Communication Networks**

Time: 3 hrs.]

[Max. Marks:100

**Note: 1. Answer any FIVE full questions.**  
**2. Assume missing data suitably.**

- 1 a. Explain the need for computer networking. What are the uses of computer network? (06 Marks)
- b. Differentiate between :
  - i) Services and protocols.
  - ii) Connection oriented and connectionless services. (09 Marks)
  - iii) Broad cast and point to point communication. (05 Marks)
- c. Compare OSI reference model with TCP/IP reference model. (05 Marks)
- 2 a. Compare circuit switching, packet switching and message switching methods with reference to delay, throughput and overhead. (08 Marks)
- b. If a binary signal is sent over a 3 kHz channel whose S/N ratio is 30 dB, what is maximum achievable data rate? (05 Marks)
- c. Ten signals of 4000 Hz each are multiplexed, on to a single channel using FDM. Find out the minimum bandwidth required for multiplexed channels. Assume guardbands are 400 Hz wide. (07 Marks)
- 3 a. What is framing? Mention various framing techniques. Explain how bit stuffing is used in framing? (06 Marks)
- b. If the CRC code is 10100010111100 and generator polynomial is  $x^4 + x^3 + x^2 + 1$ , check if there is any error in the code word. (06 Marks)
- c. What are sliding window protocols? Explain Go-back-n protocol. (08 Marks)
- 4 a. Compare pure ALOHA with slotted ALOHA. What are the reasons for poor channel utilization in ALOHA systems? How the same is improved in CSMA. (08 Marks)
- b. Discuss the concepts of,
  - i) 1 – persistent CSMA.
  - ii) Non-persistent CSMA. (06 Marks)
- c. Explain working of CSMA/CD. Compare throughput as a function of load for different random access protocols with a graph. (06 Marks)
- 5 a. Compare virtual circuit and datagrams of subnets. (06 Marks)
- b. Explain hierarchical routing with example. (07 Marks)
- c. Find the subnet address for the following : (04 Marks)

IP address	Mask
125.54.12.56	255.255.0.0
141.181.80.16	255.255.224.0

- d. Convert IP address whose hexadecimal representation is C22F1582 to dotted decimal notation. (03 Marks)

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Page No...2

EC73

- 6 a. What are the general principles of congestion control algorithms? Explain the leaky bucket algorithm. (10 Marks)  
b. Explain shortest path routing with suitable illustrations. (10 Marks)
- 7 a. Explain the different fields in TCP header and mention the fields that are used for addressing, error control and flow control. (08 Marks)  
b. Explain three way hand shake based connection establishment in TCP. (08 Marks)  
c. A TCP connection has a 65, 535 bytes windows sent over 1 Gbps channel. Round trip time is 20 m. Determine maximum achievable throughput. (04 Marks)
- 8 Write short notes on any four :  
a. Blue tooth technology.  
b. Gigabit Ethernet.  
c. QOS parameters with respect to transport layer.  
d. SMTP.  
e. IPV6. (20 Marks)

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<b>NEW SCHEME</b>
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10

Seventh Semester B.E. Degree Examination, May / June 2006

EC / TE

**Computer Communication Networks**

Time: 3 hrs.]

[Max. Marks:100

**Note: Answer any FIVE questions.**

- 1** a. Differentiate between :
- Hub and Web.
  - Service and protocol.
  - Connectionless and connection oriented service.
  - Confirmed and unconfirmed service. (08Marks)
- b. Explain TCP / IP model and compare it with OSI model. (08Marks)
- c. Identify the specific OSI layers which are responsible for the following:
- Routing of packets.
  - Compression of data.
  - Providing end to end reliable services.
  - Providing node to node reliable services. (04Marks)
- 
- 2** a. Compare
- Coaxial and optical medium.
  - Wired and wireless communication. (08Marks)
- b. Describe the salient aspects of a Telephone system, indicating a typical circuit route for a maximum distance call. Explain local loop-wired as well as wireless. (08Marks)
- c. Calculate the channel capacity of a telephone channel having a Band width of 3.4 kHz and SNR of 40 dB. (04Marks)
- 3** a. Discuss the design issues related to data link layer. (04Marks)
- b. What is ARQ? Discuss in detail
- Pipe lining.
  - Go-back-N protocol. (10Marks)
- c. A sending station sends frames of 1 k byte length at a rate of 4 Mbps over a link, with a round trip time of 40 ms. Calculate the minimum value of time out time. Calculate effective line rate and efficiency of the algorithm. (06Marks)
- 4** a. Describe the various versions of CSMA protocol and CSMA / CD. (08Marks)
- b. Differentiate between :
- IEEE 802.3 and DIX frame format.
  - Thick and thin Ethernet (08Marks)
- c. Sketch
- Manchester
  - Differential Manchester
- Encoding for bit pattern 10011. (04Marks)



- 5 a. Describe i. Why wireless LAN is becoming popular. (10Marks)  
ii. CSMA / CA and its modes of operation. (06Marks)
- b. Write a note on virtual LAN. (06Marks)
- c. A receiver that uses CRC receives the message bits 11110000 11 00 and uses the generator polynomial  $x^4 + x^3 + 1$ . Find out whether the message has encountered error during transmission. (04Marks)
- 6 a. Describe the principle of i. Link state routing ii. Hierarchical routing. (08Marks)
- b. Discuss the need for a Bridge in interconnecting LANS. With a diagram explain the connectivity of wireless LAN with Ethernet, using suitable bridge circuit. (06Marks)
- c. Consider a subnet of 720 routers. Discuss how this can be partitioned into three hierarchical regions and find out the routing table entries in each region. Assume data suitably in making the partition. (06Marks)
- 7 a. Describe the structure and various fields of i. TCP header ii. UDP header. (08Marks)
- b. What is congestion in network? Discuss. Briefly describe the methods of congestion control. (06Marks)
- c. Discuss Class - A and class - B methods of Internet addressing. Mention minimum and maximum range possible with these types of addressing. (06Marks)
- 8 a. What is meant by QOS? Discuss the Leaky Bucket algorithm to ensure quality of service. (10Marks)
- b. Write short notes on : i. Blue Tooth technology. (10Marks)  
ii. Giga - bit Ethernet.

Reg. No. 

**Seventh Semester B.E. Degree Examination, January/February 2006**  
**Electronics and Communication Engineering**  
**Computer Communication Networks**

Time: 3 hrs.)

(Max.Marks : 100)

**Note:** 1. Answer any FIVE full questions.  
 2. All questions carry equal marks.

1. (a) Differentiate between OSI and TCP/IP network reference model. (5 Marks)
- (b) What is Peer-to-Peer communication? Give an example. (5 Marks)
- (c) Describe the internet architecture. (5 Marks)
- (d) Five routers are to be connected in a point-to-point subnet. Between each pair of routers, the designer may put a high, medium, low speed line or no line. If it takes 200ms of computer time to generate and inspect each of topology, how long will it take to inspect all of them? (5 Marks)
2. (a) If a binary signal is sent over a 3 kHz channel whose S/N ratio is 30dB, what is maximum achievable data rate? (4 Marks)
- (b) Differentiate between circuit switching and packet switching. (5 Marks)
- (c) Ten signals of 4000 Hz each are multiplexed on to a single channel using FDM. Find out the minimum band width required for the multiplexed channel. Assume guard bands are 400Hz wide (6 Marks)
- (c) Differentiate between character stuffing and bit stuffing with examples. (5 Marks)
3. (a) A bit stream 100 111 01 is transmitted using CRC method. The generator polynomial is  $x^3 + 1$ . Show the actual bit string transmitted. (6 Marks)
- (b) A channel has a bit rate of 4 kbps and a propagation delay of 20 msec. For what range of frame sizes does stop and wait protocol give an efficiency of atleast 50%? (4 Marks)
- (d) Differentiate between pure ALOHA and slotted ALOHA. (10 Marks)
4. (a) What is need of using Manchester encoding in 802.3 Ethernet? Give example of Manchester coding. (5 Marks)
- (b) Describe functioning of an ethernet switch. (5 Marks)
- (c) Explain DCF & PCF modes of 802.11 MAC protocol. (5 Marks)
- (d) Define the following : (5 Marks)
  - i) Repeater ii) Hub
  - iii) Switch iv) Router
  - iv) Gateway

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Contd. :

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5. (a) Compare virtual-circuit and datagram types of subnets. (6 Marks)
- (b) Explain hierarchical routing with an example. (8 Marks)
- (c) A network on the internet has a subnet mask of 255.255.240.0. What is maximum number of hosts that it can handle? (3 Marks)
- (d) Convert IP address whose hexa decimal representation is C22F1582 to dotted decimal notation. (3 Marks)
6. (a) Mention the techniques for achieving good quality of service (QoS). Explain how leaky bucket algorithm is used to achieve QoS. (8 Marks)
- (b) If delays are recorded as 8 bit numbers in a 50 router network, and delay vectors are exchanged twice a second, how much band width per line is consumed by distributed routing algorithm? Assume that each router has three lines to other routers. (6 Marks)
- (c) Differentiate between IPV4 and IPV6. (6 Marks)
7. (a) Explain the different fields in the TCP header and mention the fields that are used for addressing, error control and flow control. (8 Marks)
- (b) Explain three way handshake based connection establishment in TCP. (8 Marks)
- (c) Suppose that the TCP congestion window size is set to 18kB and a time out occurs. How big will the window be if next four transmission bursts are all successful? Assume that maximum segment size is 1kB. (4 Marks)
8. Write notes any FOUR :
- a) Address resolver in DNS
  - b) www
  - c) SMTP
  - d) Congestion control
  - e) Broadcast routing
- (4×5=20 Marks)

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Seventh Semester B.E. Degree Examination, January/February 2005

Electronics &amp; Communication/Telecommunication Engg.

**Computer Communication Networks**

Time: 3 hrs.]

[Max.Marks : 100

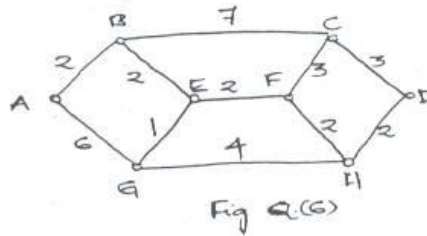
- Note:** 1. Answer any FIVE full questions.  
2. All questions carry equal marks.

1. (a) What are the two reasons for using layered protocol? List the functions of each layer in TCP/IP reference model. (10 Marks)
- (b) State and explain the significance of Shannon's theorem. What signal to noise ratio is needed to put a T1 carrier on a 50 KHz line? (10 Marks)
2. (a) Distinguish between circuit switched and packet switched networks. For an application like FTP what is the preferred type network - comment. (5 Marks)
- (b) Describe the ISDN system architecture. (5 Marks)
- (c) Give the salient features of both TDM and FDM. (10 Marks)
3. (a) Give the 802.3 frame format. Comment on the length field. (5 Marks)
- (b) Sketch Manchester and differential Manchester encoding for the data stream 1000101111. (5 Marks)
- (c) A 10 Base 5 Ethernet has a 250m bus. Calculate the following parameters for the network
  - i) Maximum medium length
  - ii) Medium propagation speed.
  - iii) Maximum propagation delay.
  - iv) Capacity = number of Bits a station can transmit per second.
  - v) Average frame bit length
  - vi) Average frame transmission time
  - vii) Bit length of the frame
  - viii) Value of parameter  $a = \frac{\text{Maximum propagation delay}}{\text{Average transmission time}}$ . (10 Marks)
4. (a) Give the frame structure of FDDI. Briefly explain each field. (5 Marks)
- (b) Given the message bit stream to be 1101011011 and the generator bit stream to be 10011, compute the actual bit stream transmitted. If the received stream is 11000110111010, what is the remainder at the receiver end and what is your conclusion about this transmission? (10 Marks)
- (c) Where are hamming codes used and how? (5 Marks)



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5. (a) Explain the concept of sliding window protocol. What are its drawbacks? Explain the various enhancements suggested to overcome those. (10 Marks)
- (b) What is bit stuffing? What is its significance? If the bit string is 011011111011111011111010010 is bit stuffed, what is the output string? (5 Marks)
- (c) Distinguish between virtual circuit and datagram subnets. (5 Marks)
6. Given the following graph representing the network,



- a) Apply shortest path routing algorithm and find the routing table at each node. (10 Marks)
- b) Apply flow based routing algorithm to find the traffic and the routing matrix. (10 Marks)
7. (a) List the transport layer's quality of service parameters and explain them briefly. (10 Marks)
- (b) Under what conditions of delay, bandwidth, load and packet loss will TCP retransmit significant volumes of data unnecessarily? (10 Marks)
8. Write short notes on : (5×4=20 Marks)
- CSMA/CD Protocols
  - ATM header format
  - Satellite networks
  - Network applications.