

**BITS, Pilani-Dubai ,
International Academic city
III Year Second Semester 2008-09
Degree:B.E.(Hons) Branch:C.S.E**

COURSE NO. : CS C461 Computer networks
Date: 2nd June 2009 Total marks=65 (closed book) Weightage=40%
Comprehensive exam Answer all the questions Time- 3 hrs

Part-A (Answer all the questions 5 *10= 50 marks)

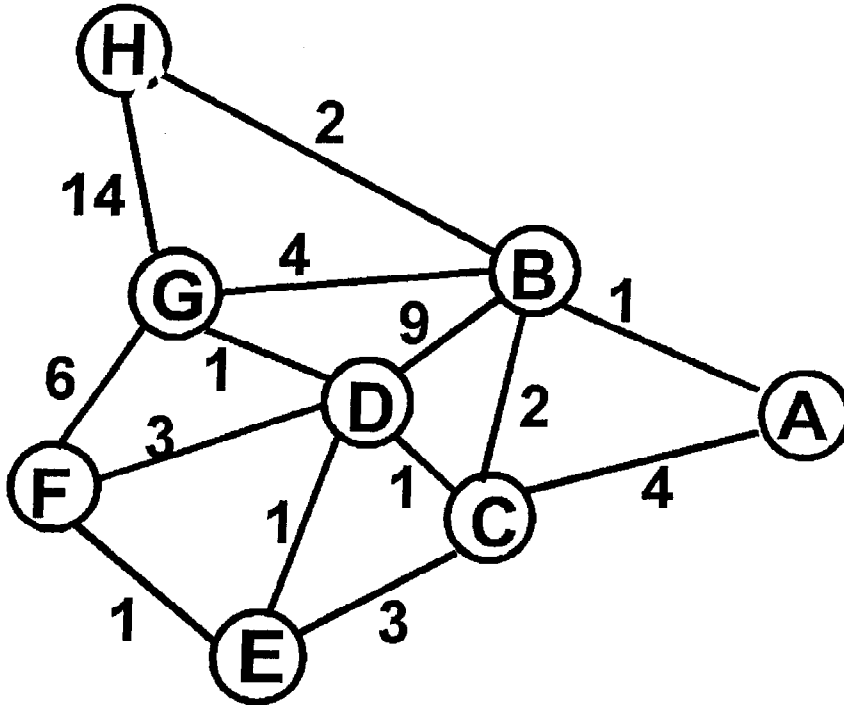
Q1.a) Assume classful addressing is employed. Outline the merits of subnetting compared to non subnetting when you have two lans to be connected to the internet but the total number of nodes is 100. (3M)

b) In BITS Pilani assume that there are 7 engineering departments and each department wants to have a local network. Suppose the entire BITS has been assigned a single Classful network address whose value is 211.77.20.0. Each computer in every department wants to get connected to the internet using IP address. Outline a subnet based design mechanism by which the above can be accomplished. How many nodes can be connected to every lan in the above design ? (7M)

Q2. Consider an organization that needs 1000 IP addresses for connecting 1000 computers to the internet . Outline how it can be done with classful addressing.(without subnetting and CIDR)(3M)

On the other hand if we go for CIDR addressing then outline with necessary diagrams how networking is done and the resultant benefits. Let the network address for the first lan is 200.11.8.0 when you go for CIDR.(7M)

Q3. AT&T is an internet service provider. It wants to monitor the health of its routers which form part of the internet. Outline with necessary diagrams how using SNMP protocol, the monitoring and diagnosis of its routers can be carried out from a management console. (10M)

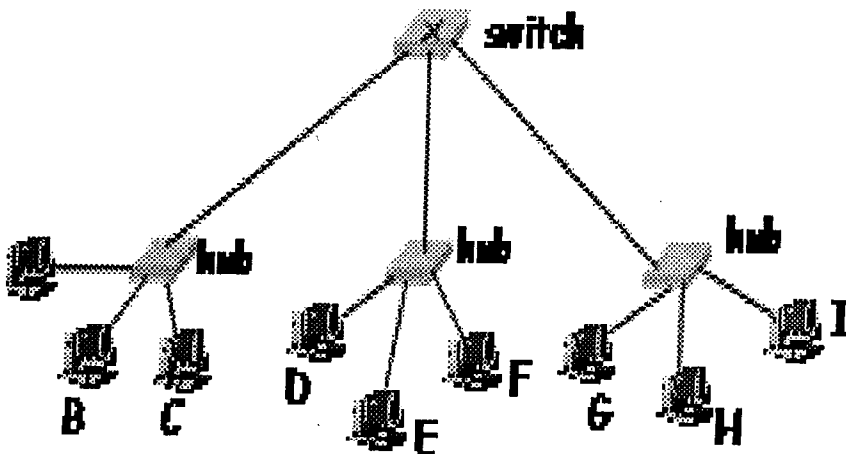


Q4.a) With respect to the above network (interconnection of routers) outline how using distance vector algorithm routine tables will be formed in every router.

Derive the routing table for the node F. (7M)

b) Suppose the direct link between nodes C and B got broken. Then what will happen to the routing table in F? (3M)

Q5.



a) Consider the above diagram. Assume initially that the table in the switch is empty. Outline how the entries in the table are getting filled and the packets are transferred by the switch during the following data transfer initiated by nodes. (7M)

A sends packet to C

G sends packet to A

D sends packet to G

B sends packet to I

I sends packet to A

B send packet to I.

b) Suppose the Ethernet switch in the above diagram is replaced by a hub justify what will happen to the overall collision domain? (3M)

Part-B questions (Answer all questions . All questions carry equal marks 5*3=15M)

Q1. Consider an IPV6 network. Let the source A fragments a packet into 2 fragments and send the same via the following specific routers R1, R2 and R3 to the destination B. For the above scenario draw the necessary IPV6 header diagrams and briefly explain the same.

Q2. With diagrams outline how flow control is achieved in TCP based communication.

Q3. Suppose I want to send 2000 bytes of information using ATM network. Outline the percentage overhead involved using AAL5 layer.

Q4. Under the following scenarios outline how a small packet of 53 bytes is a better choice for ATM rather than choosing a big packet size of 4 Kilo Bytes for improving the queue behaviour. Assume the speed of the link is 100 Mbps.

a) Completion of a reception of high priority packet is over just after starting the transfer of low priority packet and the resultant waiting time for high priority packet

b) When 2 packets start arriving via different interfaces of the ATM switch nearly simultaneously and the resultant link idle time and packet delay in queue.

Q5. Consider IP based mobile routing from a correspondent to a mobile node. Let the source address of the correspondent is 200.11.2.4.

Let the permanent address of the node is 128.119.40.186. Initially the mobile node was within the home network and the correspondent was communicating to the same. Then during communication with correspondent the mobile node moves to a foreign network and got assigned a care of IP address as 79.129.13.2. Outline using packet diagrams how using IP mobile routing still the packets from correspondent gets delivered to the new destination of mobile node without interruption. In the above scenario how packet from mobile node gets routed to correspondent?

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Test2 Date:3-5-09 Time =50 mts **Total marks=20 (open book)**
Text book,Reference book and class notes permitted **Weightage=20%**
Answer all the questions

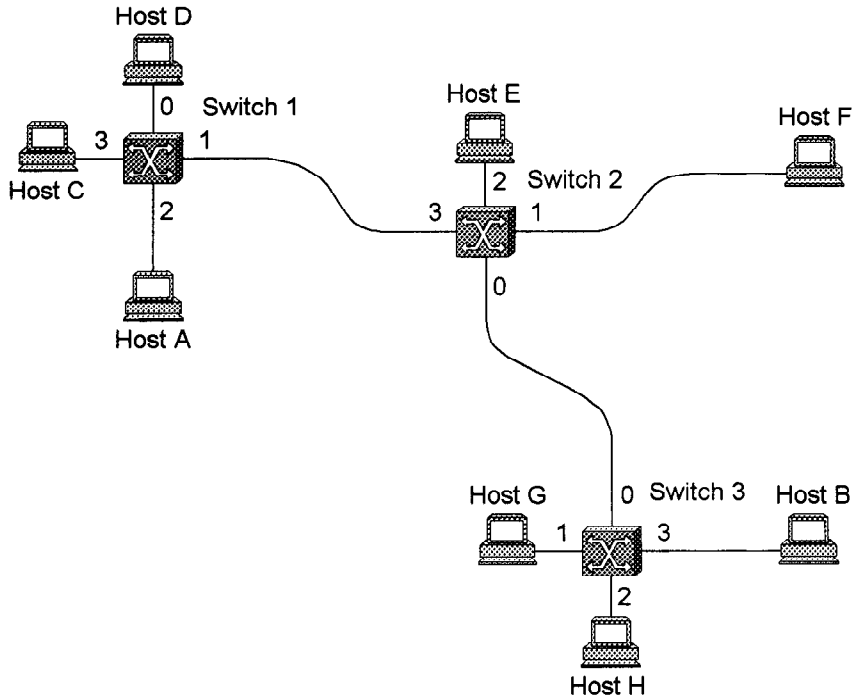
Answer all the questions

Q1. Consider a network with a ring topology, link bandwidth of 10 Mbps and propagation speed 3×10^8 m/sec. what would be the circumference of the loop to exactly contain one 500-byte packet assuming nodes do not introduce delay? Suppose each node introduces a finite delay justify what will happen to circumference size of the loop to have 500 byte packet (3 +2)

Q2. Suppose 2 nodes A and B are attached to opposite ends of a 900m cable and that each have one frame of 1000 bits (including headers and preambles) to send to each other. Both nodes attempt to transmit at time $t=0$. Suppose there are four repeaters between A and B each inserting a 20-bit delay. Assume the transmission rate is 10Mbps, and CSMA/Cd with backoff intervals of multiples of 512 bits is used. After the first collision A draws $K=0$ and B draws $K=1$ in the exponential back off interval. Ignore the jam signal and 96-bit time delay.

- a) What is the propagation delay including repeaters between A and B? Assume the signal propagation speed is 2×10^8 m/sec. (2 M)
- b) At what time A's packet completely delivered to B? (3M)

Q3.



Q3.

Consider the above network consisting of ATM switches.
Let the traffic from C to B and C to F happen in parallel.

- Derive the translation tables for the switches involved in packet transfer from Host C to Host B (2.5M)
- Derive the translation tables for switches involved in packet transfer from Host C to Host F. (2.5M)

Make necessary valid assumptions if anything is needed.

Q4.

Justify why the Ethernet efficiency increases

- when propagation delay is very small and b) packet transmission time is high (2.5M)

b) Suppose a 100 Mbps point to point link is being set up between earth and a new lunar colony. The distance between moon to earth is approximately 385000 km and data travels at the speed of light 3×10^8 m/sec.

A camera on the lunar base takes pictures of Earth and saves them in digital format to disk. Suppose mission control on earth wishes to download the most current image which is 25 MB. What is the minimum amount of time that will elapse between when the request for the data goes out and transfer is finished. (2.5M)

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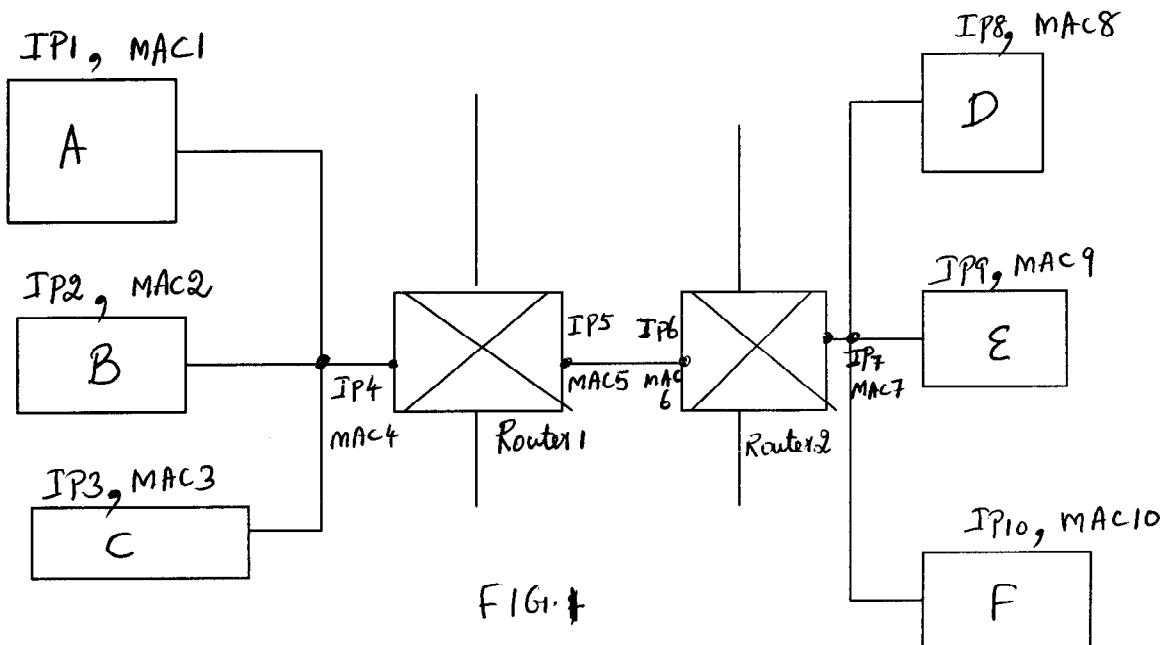
COURSE NO. : CS C 461

Computer networks

Test1 Date: 29-3-09

Total marks=25 (closed book) Weightage=25%

Answer all the questions



In the above diagrams IP address and MAC addresses are given for various nodes present in internet.

With respect to the above diagram outline how a packet from source node A reaches the destination node D with details about various address headers of the packet. [5m]

Q2.

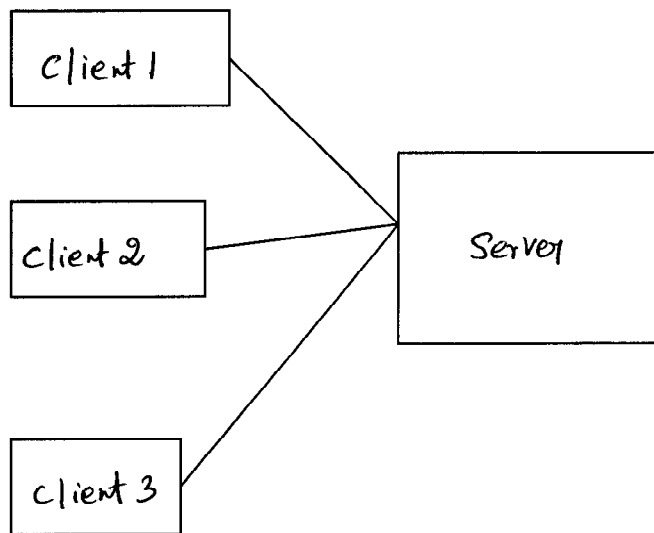


FIG.2

Q2.a) with respect to the above diagram outline how TCP communication takes place between 3 clients and a web server and highlight the things taking place in the server side.[3 m]

b) When you run a server and client programmes which programme will you run first and then second? Justify.[2m]

Q3. Outline the need for session tracking by server. How session tracking is done between a browser and server using http headers.[2+3]

Q4. Compare the relative performance of polling and TDMA based implementation of MAC protocols in satisfying the goals of an ideal MAC protocol.[2.5+2.5]

Q5.what is meant by parameter “a” in MAC protocol ?

Can we use CSMA/CD as a MAC protocol when a is =10.? Justify. What sort of MAC protocol will you use for the above value of “a” ? .[5]

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Time :15 mts

Date :2-4-2009

Marks: 5 Quiz2 Closed book

Q1. What are the factors that decide the total latency between two systems that lie across different continents and connected by internet?

Q2. Consider a point to point optical fiber link of length 4 km. Let the speed of light in cable is $2 * 10^8$ m/sec. At what bandwidth propagation delay will be equal to the transmit delay for a packet of 1000 bytes.

Q3. What is the need for TSI in TDM switching ?

Q4. What is meant by hidden node problem in WLAN ?

Q5. Specify a merit and demerit of polling compared to CSMA/CD.

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Computer networks

Test1 Date: 11-3-09

Total marks=5 (closed book) Weightage=5%

Quiz1

Answer all the questions

Q1. Specify any 2 important differences between activities of transport and network layers.

Q2. Draw the diagram for an internet ready packet that emerges from the data link layer of a networked application that uses internet protocol stack. Assume that the packet contains the message "welcome to BITS"

Q3. `BufferedReader inFromClient = new BufferedReader(new
InputStreamReader(connectionSocket.getInputStream()));`

Q4. Briefly Outline how session tracking is done using session layer between a server and a browser ?

Q5. Specify two important differences between packet transmission via UDP and TCP socket.