BITS, PILANI-DUBAI
DUBAI INTERNATIONAL ACADEMIC CITY, DUBAI
II SEMESTER 2010

COURSE	: CS C461 Computer Networks	III YEAR
COMPONENT	: Comprehensive Examination	
DURATION	: 3 hours.	
WEIGHTAGE	: 40% (80 Marks)	
Date	: 26-05-2010	

Note: Answer Part A and Part B in separate answer sheets.

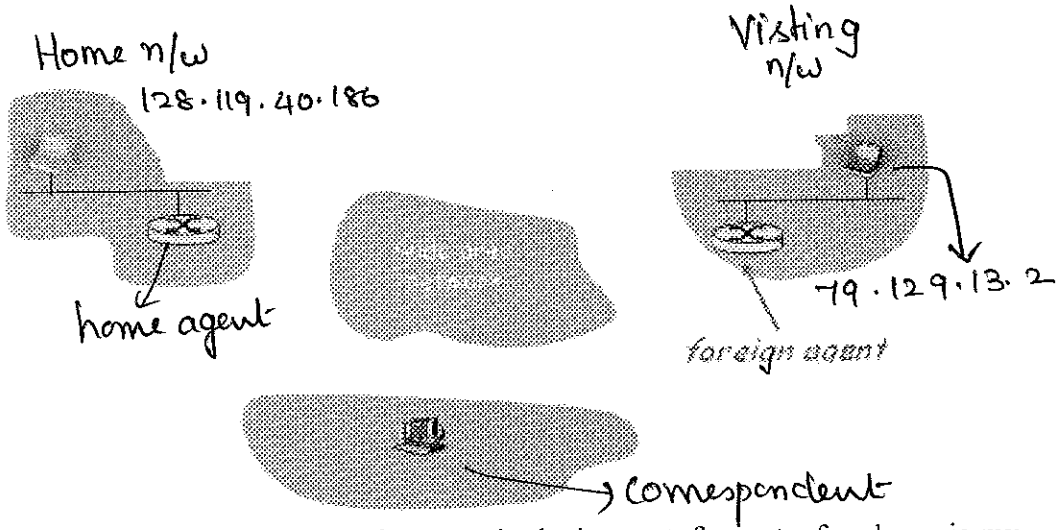
PART-A

1. Explain how control between sender flow and receiver is achieved using sliding window protocol using TCP socket communication. [6 M]

2. Briefly explain the messages involved in establishing connection and terminating connection in transport layer of TCP protocol between a client and server. [4 M]

3. Briefly explain hybrid cryptography and its advantages [4 M]

4. When mobile node moves from its home network to foreign network, how that uninterrupted communication takes place between mobile node and the correspondent. [6 M]



5. I want to monitor the health of a router in the internet from at a far place via my computer. Suggest a suitable mechanism to do the same. [5 M]

6. Outline the exchange of messages between a DHCP server and client in getting the IP address. [5 M]
7. Illustrate any four advantages of IPV6 over IPV4. [5 M]

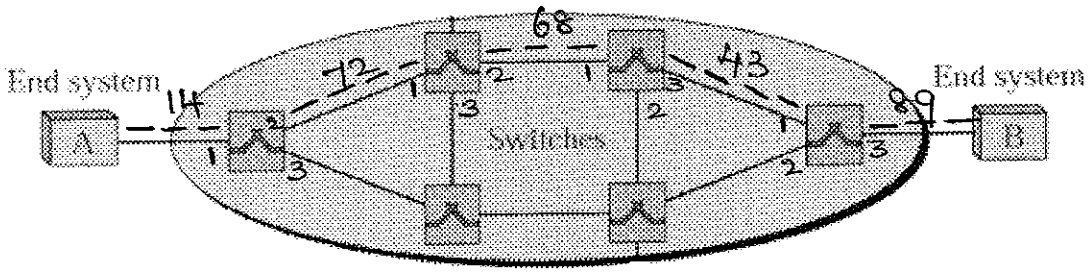
PART-B

1. Suppose nodes A and B are on the same 10 Mbps Ethernet segment and the propagation delay between the nodes is 245 bit times. Suppose A and B send frames at the same time, the frames collide and A and B choose KA=0 and KB=1. Assuming no other nodes are active, can the retransmission from A and B collide? At what time B schedule its retransmission? What time does A begin transmission? At what time does A's signal reach B? Does B refrain from transmitting at its scheduled time? [10 M]

2. What is meant by fragmentation in networks and why there is a need for the same ? [5 M]

3. Suppose a TCP message that contains 2048 bytes of data and 20 bytes of TCP header is passed to IP for delivery. The network has an MTU of 512 bytes. Assume all IP headers are 20 bytes; find the number of packets and size of each packet delivered to the network layer at the destination host? [5 M]

4. A virtual connection is established between end system A and B. show the corresponding entries in the tables of each switch. [5 M]



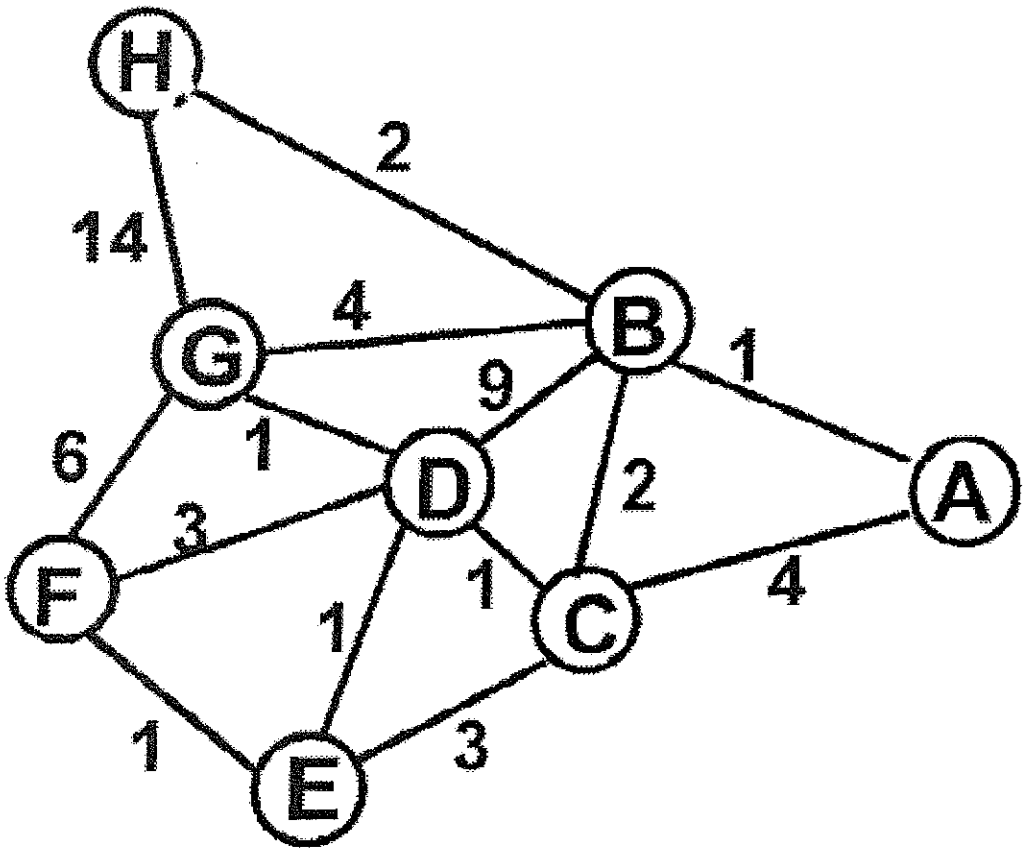
5. I have a cluster of IP addresses assigned by the service provider for my 16 networks in the organization whose 16 network addresses that vary from
   201.10.0.0
   201.10.1.0
   201.10.2.0.....
   and upto 201.10.15.0

   Outline how using CIDR, I can minimize the number of entries in routers outside the organization for routing packets that are meant for computers into my networks. In the above case how router inside and outside the organization does routing of the packet for a node whose IP address is given by 201.10.1.25.[7M]

6. Write the disadvantages of classful addressing method [3 M]

7. For the network given below, derive the routing table for the node D using distance vector algorithm. [5]

8. Explain how routing table gets built up in the routers using a routing algorithm. [5 M]



BITS, PILANI-DUBAI
DUBAI INTERNATIONAL ACADEMIC CITY, DUBAI
II SEMESTER 2010

COURSE	: CS C461	Computer Networks	III YEAR
COMPONENT	: TEST – II	(OPEN BOOK)	
DURATION	: 50 MINS		
WEIGHTAGE	: 20% (20 Marks)		
Date	: 09-05-2010		

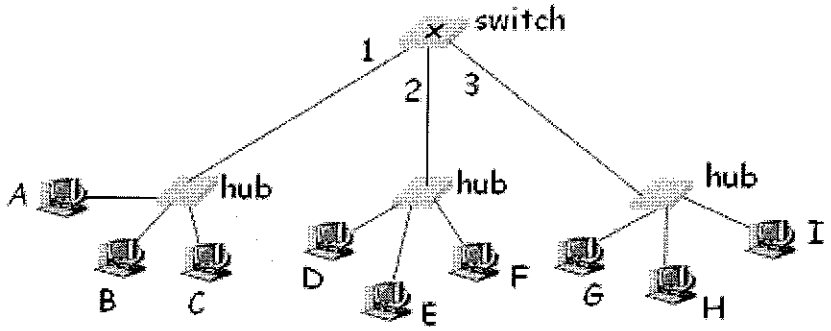
Note: Answer all the Questions.

1. a)Consider an ATM network that has AAL5 layer and there are 47,801 bytes of data to be transmitted using the same. How many padding bytes are necessary? And how many cells are produced? (7 M)

   b)Explain why padding is unnecessary in AAL1, but it necessary in other AALs.(3M)

2. Consider a broadcast channel with 10 nodes and a transmission rate of 10 Mbps. Suppose the broadcast channel uses polling for multiple access and the amount of time for polling i.e t_{poll} is 2 μs. Suppose that within a polling round, given node is allowed to transmit 100 bits. Under the above scenario what is the actual throughput of the broadcast channel? (10M)

3. Design a network which is having 6 subnets . Assign subnet address for each subnet and find the range of IP addresses for the host in each subnet. How many total nodes that can be connected ? Assume a class C address of 215.12.8.0 is assigned to the network.(10M)



4. In the above diagram, assume initially 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 by the nodes.(10M)

   A sends packet to B

P. T. O

H sends packet to C
D sends packet to G
D sends packet to H
B sends packet to G
G sends packet to C
B sends packet to G

BITS, PILANI – DUBAI
International academic road
III Year SECOND SEMESTER – 2010

Course Code: CS C461
Course Title: Computer Networks **Weightage: 25%** **Max Marks: 50**
Date: 28-03-2010 **TEST-I(Closed book)**

Answer all the questions.

Q1.Why there is a need for session tracking between a client and server ? And how is it accomplished? [3+7 marks]

Q2.Consider three analog voice signals are digitized using the sampling frequency which is twice the maximum frequency and then time multiplexed. What could be the resultant bandwidth required to transmit the multiplexed voice? If the same is multiplexed using frequency division, with a guard band of 2 KHz what could be the resultant bandwidth required to transmit the multiplexed voice? [10 marks]

Q3.Suppose two hosts A and B are separated by 10,000 Km and are connected by a direct link of 1Mbps. suppose that propagation speed over the link is
2.5*10 (power) 8 meters /second.

a) Consider sending a file of 400,000 bits from host-A to host B. Suppose the file is sent continuously as one large message, how long does it take to send the file?

b) Suppose now the file is broken up into 10 packets, each packet is acknowledged by the receiver and the transmission time of an acknowledgement is negligible. Finally assume that the sender cannot send a packet until the preceding one is acknowledged. How long does it take to send the file? [5+5 marks]

Q4.Suppose a client and server are separated by a distance of 15000 Km by a link whose capacity is 1 Mbps and the propagation speed in the link is 2*10 (power) 8 meters/second. Assume a fax is transmits an 8*10 inch black and white image at a resolution of 72 pixels/inch and each pixel is represented by 1 bit.

a) what could be the delay in the case of TCP
b) what could be the delay in the case of UDP [5+5 marks]

Q5. Consider the MAC protocols CSMA/CD and polling. Outline how they satisfy the general performance criteria specified for MAC protocols. [5+5 marks]

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SECOND SEMESTER – 2010

Course Code: **CS C461** **THIRD YEAR** Date: 06.04.2010
Course Title: Computer Networks Max Marks: 14
Duration : 20 minutes TYPE-A
Quiz2(Closed book) Weightage: 7%

Name: ..... **ID No:** ..... **Sec / Prog:** .....

Instructions: closed book- Answer all the Questions.
No. Of Questions-7

1. In CSMA /CD after the 4th collision, what will be the back off delay in terms of bits and seconds on a 10 Mbps Ethernet when K is chosen as 4? [2 Marks]

2.
```
import java.io.*;
import java.net.*;
class TCPServer {

public static void main(String argv[]) throws Exception
  {
   String clientSentence;
   String capitalizedSentence;

   ServerSocket welcomeSocket = new ServerSocket(6789);

   while(true) {
       System.out.println("I am OK");
     Socket connectionSocket = welcomeSocket.accept();
      System.out.println("we are OK");     [2 Marks]
     ..............
     ..............
```

In above sequence of codes for TCP server, when "I am OK" alone gets printed and when "we are OK" is also printed? [2 MARKS]

PTO

5

3. Justify the need for TTL in ARP table? [2 Marks]

4. How CSMA/CA done in wireless LAN? [2 Marks]

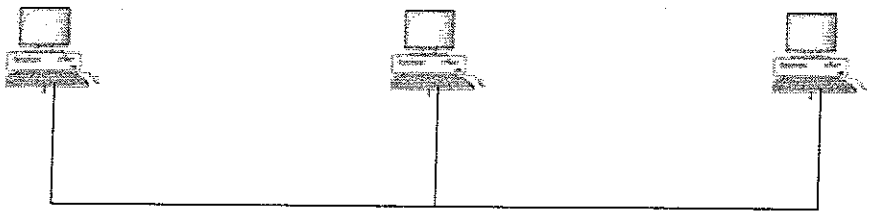
5. What is meant by hidden node problem in WLAN? [2 Marks]

PTO

6. Justify with reason why efficiency in the Ethernet is 1 when a) propagation delay =0 or b) d transmission (which is time for transmitting a max size frame) is very high. [2 Marks]

7. The IP and the MAC address of A,B C are IPA,IPB,IPC and MAC A,MAC B,MAC C. Node A wants to send frames to node C , where A and C are in the same subnet . Write the steps involved if A don't have the MAC address of C but has the IP address of C

[2 Marks]



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SECOND SEMESTER – 2010

Course Code: **CS C461** **THIRD YEAR** Date: 22.02.2010
Course Title: Computer Networks type-A Max Marks: 16
Duration : 20 minutes
Quiz1(Closed book) Weightage: 8%

Name: ..... **ID No:** ..... **Sec / Prog:** .....

Instructions: closed book- Answer all the Questions.

1. Write the advantage and disadvantage of star topology? [2 Marks]

2. What is the difference between logical address and port address? [2 Marks]

3. Justify and Explain where we need TCP and where we need UDP transport protocols ? [2 Marks]

4. What is 3-way handshake in TCP? [2 Marks]

PTO

5. In TCP, how is the port number of connection socket is decided? [2 Marks]

6. Illustrate with examples , the services provided by the application layer? [2 Marks]

7. Draw, how the packet will be routed from end system S1 which has network address IP1 and physical address MAC1 to end system D1 which has network address IP6 and physical address MAC6 where the router interface, network and physical addresses are as given in the diagram. [4 Marks]