

BITS, Pilani-Dubai Campus, Knowledge Village, Dubai
III Year Second Semester 2007
Degree: B.E.(Hons) Branch: C.S.E

COURSE NO. : CS UC461

Computer Networks

Date: 24-5-07

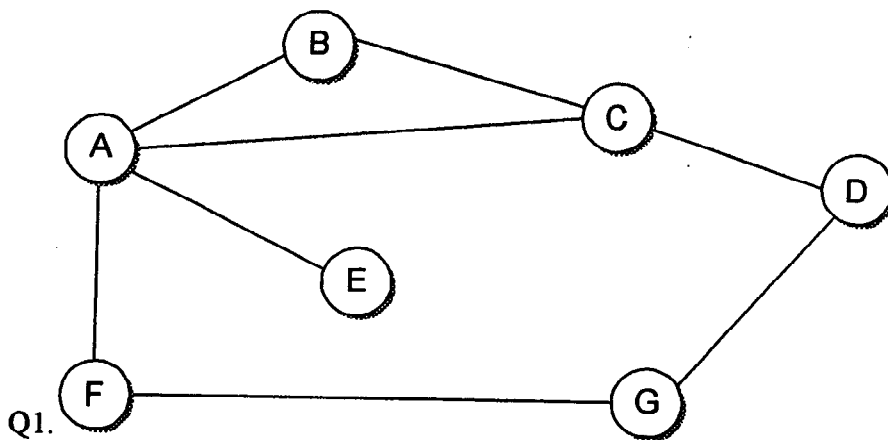
Total marks=65 (closed book) Weightage=40%

Comprehensive exam

Answer all the questions

Part-A (5*10=50M)

Q1.



Q1.

a) Assume all the nodes are routers which are interconnected using links. Let the cost involved in sending a packet to neighbor router from any of the routers is 1. Now outline the steps involved in forming routing table at the node A using distance vector algorithm. (5M)

b) How the routing table at A gets adjusted when link FG is broken? (5M)

Q2 a) with the help of relevant diagrams outline how using appropriate TCP segments connection is established between sender and receiver using TCP. How packets are reliably delivered using TCP type of transport layer (3M)

b) Similarly how flow control between sender and receiver is achieved between sender and receiver? (4M)

c) How congestion control is done at the sending side? (3M)

Q3. Assume a TCP based packet with 2048 bytes of data/20 bytes of TCP header is passed to IP layer for delivery across two networks of an internetwork – first network uses 14 bytes of data link header and has an MTU of 1024 bytes and second uses 8 bytes of data link headers with an MTU of 512 bytes. MTU gives the size of largest IP datagram in a link layer frame. Give the sizes and offsets of the sequence of frames

delivered to the network layer at the destination host. Assume all IP headers are 20 bytes.(10M)

Q4.

A		
Node	Cost	Nexthop
B	1	B
C	2	B
D	1	D
E	2	B
F	3	D

F		
Node	Cost	Nexthop
A	3	E
B	2	C
C	1	C
D	2	E
E	1	E

Suppose we have the forwarding tables shown in FIG for nodes A and F in a network where all links have cost 1. Give a diagram of the smallest network consistent with these tables.(10M)

Q5. a)An organization wants to form subnets for four departments Lans A,B,C and D by sharing a common network address :

- Lan A 60 hosts
- Lan B 60 hosts
- Lan C 60 hosts
- Lan D 60 hosts

Outline using diagrams appropriate design using subnetting. Assign appropriate network address and subnet addresses needed (5M)

b)I am having an organization. In the organization every network contains 250 nodes. There are totally 8 networks . Now give an appropriate solution so that I can connect all the nodes in the internet with minimum over head in router tables and good address space usage efficiency.. Choose the network address for the first network as 200.11.8.0. (5M)

Part -B questions (5*3=15M)

Q1. How using hybrid cryptography secured information is exchanged between 2 nodes across the internet ?

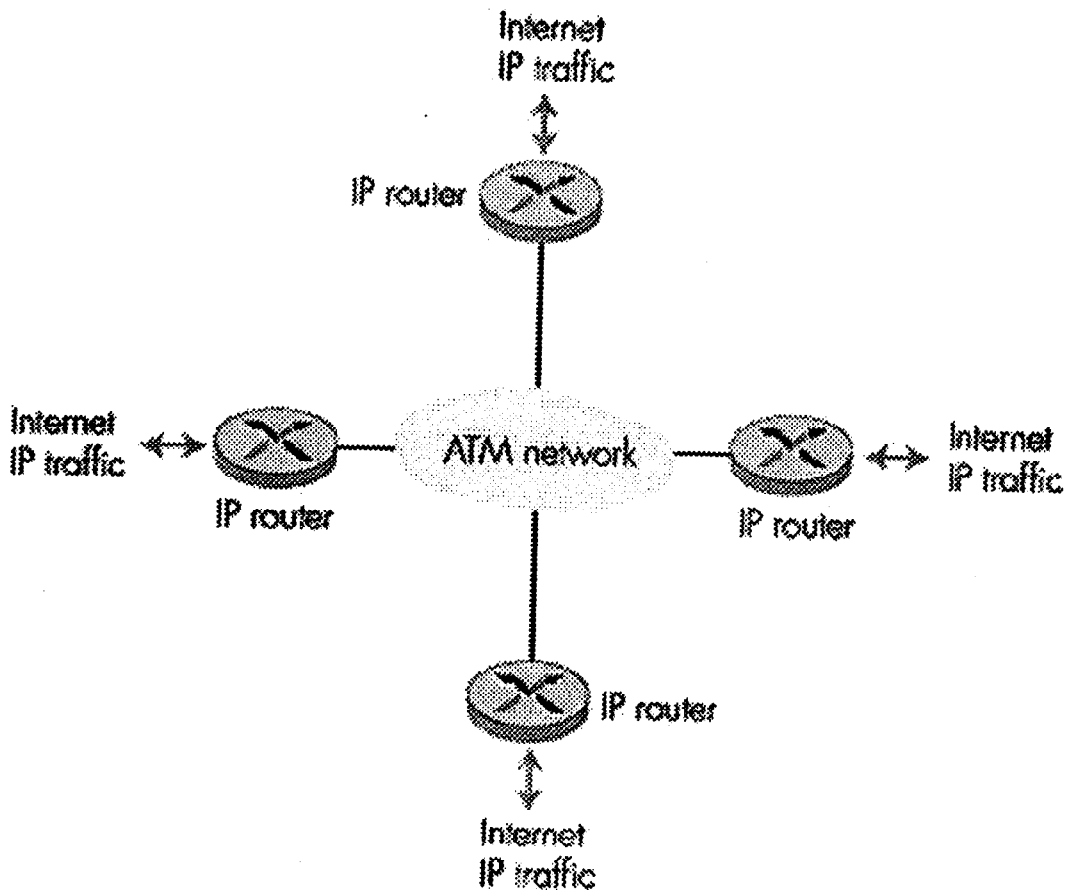
Q2. with relevant diagrams outline the need for minimum frame size in an Ethernet ?

Q3. With diagrams outline how fragmentation of packets is handled in IPV6?

Q4. Outline briefly mobile routing when a mobile node moves from one wlan to another due to mobility

Q5

5.



With respect to the above diagram outline how the IP traffic is routed from Left most router to the rightmost router

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Test1 Date: 25-2-07

Total marks=30 (closed book) Weightage=20%

Answer all the questions

1. Outline with the help of a diagram how information is sent from a networked application in system1 to another networked application in system2 using OSI layer model outlining the significance of each layer. (8M)
2. a) I am having 4 computer nodes. I want to connect them using a particular network topology so that any time two pairs of computers can communicate in parallel. With respect to a diagram outline the preferred topology. (4M)

b) In terms of bus collision compare the performance of ring topology and bus topology. (4M)
3. we want to send data from a node with network address A and physical address 10, located on one LAN1, to a node with a network address P and physical address 95, located on another LAN3. Let Lan1 and Lan3 are connected using 2 routers in a ring network called Lan2. Outline how the data is routed in the above scenario. Make necessary valid assumptions. (8M)
4. with the help of diagrams outline the difference between circuit switching, message switching and datagram packet switching. (6 M)

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Computer networks

Quiz1 Date: 22-3-07 part A Total marks=15 (closed book) Weightage=10% Time=30min

Answer all the questions All questions carry equal marks

Q1. What is the significant difference between UDP and TCP socket ?

Q2. What is meant by hidden node problem in wireless lan?

Q3. What is the need for Time slot interchange in TDM?

Q4. Four 2-Kbps connections are multiplexed together. A unit is 1 bit.
Find (a) the duration of 1 bit before multiplexing, (b) the transmission rate of the link,

Q5. With respect to the above question what is (c) the duration of a time slot after multiplexing, and (d) the duration of a frame

Q6. Outline very briefly how hidden node problem can be solved in wireless lan?

Q7. Outline an example for taking turns protocol for multiple access control ?

Q8. What is meant by statistical multiplexing?

Q9. Justify which type of socket is suitable for Multimedia data transmission.

Q10. Outline briefly two types of networks formed using wlan

Q11. What is the difference between hop to hop delivery and end to end delivery in networks?

Q12. What is meant by multiplexing and demultiplexing in transport layer?

Q13. Let there be 3 nodes in bus topology. Let the capacity of the shared medium be $3R$ bits/sec. Now what is the theoretical maximum rate for each channel that uses a MAC protocol?

Q14. W.R.T to Q13 how does the theoretical max for a node deviate for CSMA/CD type of MAC?

Q15. W.R.T to Q13 how does the theoretical max deviate for a node that uses TDMA?