SRN | | | | | | | | | | |

PES University, Bengaluru-85

(Established under Karnataka Act No. 16 of 2013)

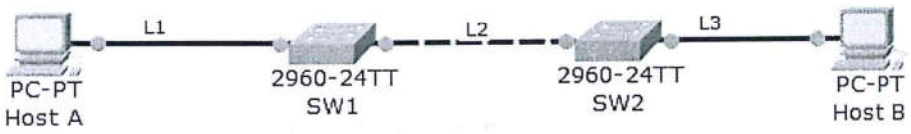
UE17CS301

DECEMBER 2019: END SEMESTER ASSESSMENT, B.TECH, V-SEMESTER

UE17CS301 – COMPUTER NETWORKS

Time: 03 Hours **Answer All Questions** **Max Marks: 100**

All the questions are compulsory
Draw the diagrams wherever necessary
Figures to the right indicates marks

1	a)	What is an Internet? Using a diagram explain 'Nuts and Bolts' required for developing any communication Network.	5
	b)	Host A is connected to Host B through a switched network having 3 links and 2 switches as shown below:  The parameters of the network are as follows :	6

Link	Data rate (R)	Speed at which bit propagates (S)	Length of the link (D)
L1	1 Mbps	$2X10^8$ meters/sec	100 KM
L2	10Mbps	$2.5X10^8$ meters/sec	1000 KM
L3	2 Mbps	$2X10^8$ meters/sec	5000 KM

Answer the following questions:

1. How long does it take a packet of length 2000 bits to propagate from host A to host B?
2. Suppose the file is 2000 bits, dividing the file size by throughput, what will be the time required to transfer the file from Host A to Host B.
3. What will be the end to end transmission time assuming no processing and queuing delay for the same file containing 2000 bits?

	c)	Suppose there are 10 users and only one user is active and generates one thousand packets containing 1000 bit each. The link capacity is 1 Mbps. Which switching technique will you suggest for this situation? Justify your answer. Also mention at least two scenarios in which the performance of packet switching network can be superior to that of circuit switching?	5
	d)	Which are the available residential access technologies for Internet access? With the help of diagram explain DSL Internet access in detail.	4

SRN | | | | | | | | | | |

2	a)	Consider the following HTTP response message generated against the request sent by the proxy cache and answer the questions based on this information. **HTTP**/1.1 200 OK **Date:** Sat, 30 Nov 2019 15:39:29 **Server:** Apache/1.3.0 (Unix) **Last-Modified:** Wed, 20 Nov 2019 9:23:24 **Content-Type:** image/gif **(data, data, data, data, ...)** i. If the object is modified, the cache forwards the object to the requesting browser but also caches the object locally. State True or False. ii. One week later if the same object is requested, which line will be added in GET message for cache's up-to-date check? iii. Suppose the object is not modified since the specified date, what will be the first line in the response message? iv. What will be the type of content in entity body if the response status line contains NOT MODIFIED. v. The value of the If-modified-since: header line is equal to the value of which header line in response message?	5
	b)	Explain with a neat diagram, the User-Server Interaction using cookies. Also mention the four components of cookie technology.	5
	c)	Explain in detail the transport services available to applications at Application Layer.	4
	d)	What is DNS protocol? What are the different services provided by DNS? Briefly explain the hierarchy of DNS servers using suitable diagram.	6
3	a)	Why sequence numbers and Timers are introduced in rdt protocols? Explain the working of Selective repeat Protocol by drawing the sender and receiver communication scenario.	5
	b)	Draw the TCP segment structure and explain the significance of Sequence number and Acknowledgement number in it. Name any two applications/protocols which uses TCP as underlying transport protocol.	6
	c)	What is Receive Window field in TCP Segment Structure? How it is helping in TCP Flow Control?	5
	d)	What is TCP Connection Management? What is the role of SYN and FIN bits in TCP three way handshake?	4
4	a)	a.1) With respect to IPV6, answer the following questions : An organization is granted the block 2000:1846:1454/48. i. What will be the CIDR notation for the first subnet in this organization? ii. What will be the CIDR notation for the third subnet in this organization?	6

SRN | | | | | | | | | | |

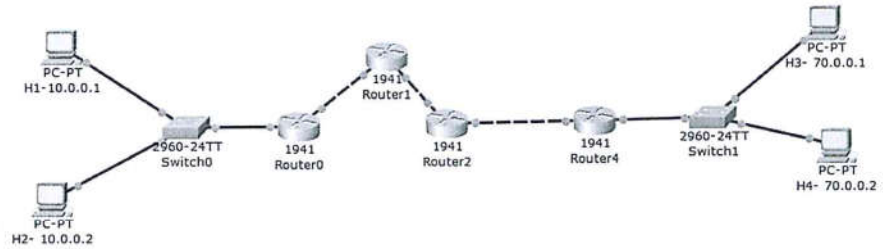
iii. If the physical address of the computer is F5-A9-21-44-7D-D3, what will be the IPV6 address of the interface in the third subnet? (Organization block: 2000:1846:1454/48)

a.2) With respect IPV4, answer the following questions :

An organization is granted the block 214.17.160.0/24. The administrator wants to create 8 subnets.

i. Find the subnet mask.
ii. Find the last addresses in first subnet.
iii. Find the first addresses in last subnet.

b) Consider the network topology given below. 4



H1 sends the datagram on the network and some fields of IP Datagram are given in the following table.

Version : 4	Header length : 1001 (expresses in binary)	TOS	Datagram Length (bytes): 2000	
Identifier: 1000			Flag: 0	Offset: 0
TTL :3	Protocol : 17		Header Checksum	
Source address 10.10.10.1				
Destination address : 70.0.0.2				
"Data"				

Answer the following questions by referring the given information.

a) The protocol field in the datagram indicates which transport Layer Protocol?
b) If the version field is changed to 6, will it be an IPV6 datagram? Yes/No?
c) Which field in this IP datagram is indicating that there are no preceding fragments?
d) To which host this datagram will be delivered?

c) Here is a network scenario: 4

PESU is connected through the NAT to public network. PESU is allocated a block of classless address by the ISP. Host A (IP address 192.168.1.1) of PESU browses www.facebook.com. Host B(IP address 192.168.1.2) browses www.google.com Request going from NAT to www.google.com has the following address fields.

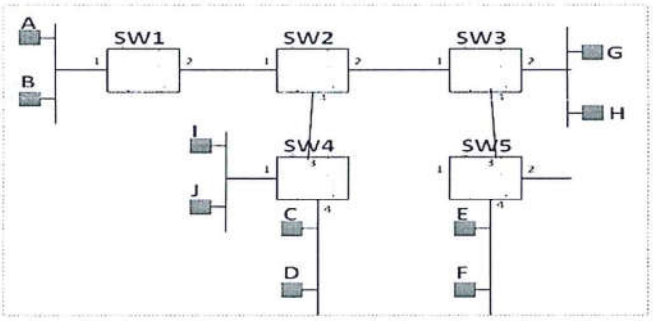
SRN

		IP address		Port address		
		Source	Destination	Source	Destination
		30.30.30.1	2.2.2.2	6666	80

The reply from www.facebook.com entering NAT has the following address fields.

		IP address		Port address		
		Source	Destination	Source	Destination
		1.1.1.1	30.30.30.1	80	7777

Write down the NAT table. (You may assume the port addresses used by hosts A & B)

	d)	When the new host arrives in the network how it obtains the IP address with the help of DHCP? Explain the four step process by drawing DHCP Client server interactions.	6
5	a)	With the help of suitable diagram explain the working of Address Resolution Protocol.	4
	b)	Here is a campus LAN implemented using 5 LAN switches. The sequence of actions taking place are as follows : **i.** A sends a frame to F **ii.** C PINGS G **iii.** E sends a frame to A  Answer the following questions : After the completion of the sequence : i) Compute the MAC table of SW4? ii) How many times broadcasting occurred in SW5? iii) What are the frames discarded by C?	6
	c)	What are different bit level error detection techniques? Explain one bit even parity and two dimensional even parity techniques with example.	4
	d)	Write Short notes on: i. Ethernet ii. WPA2	6