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

PES UNIVERSITY

PES University, Bengaluru-85

(Established under Karnataka Act No. 16 of 2013)

UE16CS301

DECEMBER 2018: END SEMESTER ASSESSMENT, B.TECH, V-SEMESTER

UE16CS301 – COMPUTER NETWORKS

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

All the questions are compulsory
Draw the diagrams wherever necessary

1	a)	Brief the responsibilities of all the layers of Internet protocol stack.	5
	b)	What is the meaning of access networks? Explain in brief the architecture of A Hybrid-fiber coaxial access network.	5
	c)	What advantages does a circuit switched network have over a packet switched network? What advantages does TDM have over FDM in a circuit switched network? (Mention 2 advantages each)	4
	d)	What is an Internet? Explain the basic building blocks of the Internet with the help of a diagram.	6
2	a)	Using a diagram, explain how a process running at one end of Internet communicates with the process at another end?	4
	b)	Consider the following HTTP GET Message. The characters <cr><lf> are carriage-return and line-feed characters. Answer the following questions with respect to the given data in the message. **GET** /CN/esa.html HTTP/1.1<cr><lf> **Host**: www.pes.edu<cr><lf> **User-Agent:** Mozilla/5.0 <cr><lf> **Accept:** text/html, ext/xml<cr><lf> **Accept-Language:** en-us,en;q=0.5<cr><lf> **Accept-Encoding:** zip,deflate<cr><lf> **Accept-Charset:** ISO-8859-1,utf-8;q=0.7,*;q=0.7<cr><lf> **Keep-Alive:** 300<cr><lf> **Connection:** keep-alive<cr><lf> <cr><lf> a) What is the URL of the document requested by the browser? b) What version of HTTP is the browser running? c) Does the browser request a non-persistent or a persistent connection? d) What is the IP address of the host on which the browser is running? e) Is it possible to fetch a jpeg image in this request? Justify.	5

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

	c)	Draw the DNS Message format and explain the interaction between various DNS servers for the Recursive Query with diagram.	5
	d)	For the Client Server Application over TCP, Why must the server program be executed before the client program? With suitable diagram highlight the main socket related activity of the client and the server that communicate over the TCP transport service.	6
3	a)	A TCP segment sent from client A to Server B is given below.	5

Source Port [5000]							Destination Port [80]
Sequence number [1001]							
Acknowledge number [4001]							
Header Length = 20		URG [0]	ACK [0]	PSH [0]	RST [0]	SYN [0]	FIN [0]	Receive Window [400]
Internet Checksum [5000]							Urgent data Pointer [1006]
Options (Nil)							
"600 bytes of data"							

1 What will be the acknowledgement number of the next segment from B to A?

2 Suppose the sequence number of the previous segment received by A was 3951. How many data bytes have been received by A through that segment?

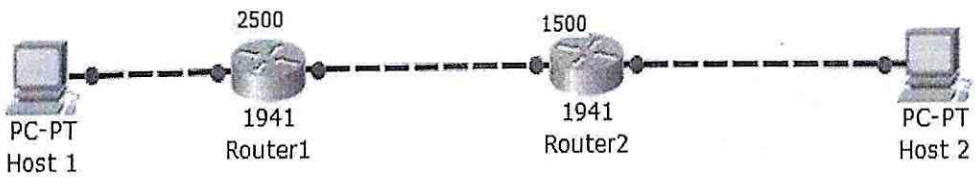
3 How many bytes are urgent in this data segment?

4 How many maximum number bytes can be sent by B to A after the receipt of this segment?

5 To which application layer protocol this segment belongs?

	b)	With the help of suitable diagram explain the working principle of Go-Back-N Protocol.	5
	c)	Draw and Explain UDP segment structure. Name any two applications/protocols which uses UDP as underlying transport protocol.	5
	d)	What is congestion window? How it helps in TCP congestion control.	5
4	a)	Refer the topology given below. Consider the transport layer segment with size of 4500 bytes, no option and IP header size of 20 bytes. Assume that a packet travels over a link with a MTU of 2500 bytes at router1.	7

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



1) Compute the fragmentation table and write in following format.

Fragment	Bytes			MF/Flag	Offset
	Total Bytes	Header Bytes	Data Bytes		

2) Assume these fragments reach a link with an MTU of 1000 bytes at Router2. Compute the fragmentation table.(In the same format mentioned above)
3) At receiver side receiver knows that a packet is a fragment. What happens when it receives a fragment with MF=0.

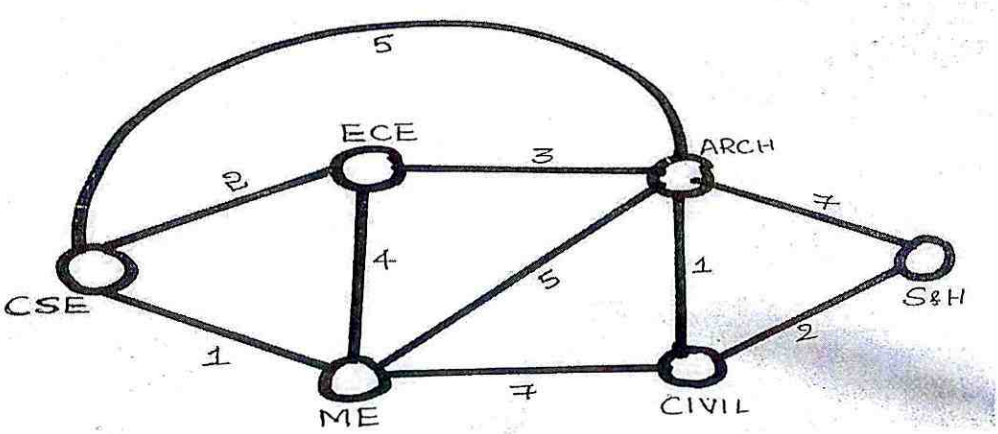
b) 1. Find the class of the following IP address

11110111 11110011 10001111 11011111

2. If the IP address of the host is 25.34.12.56/16, Write the network address. Also write the last assignable address. 5

3. An ISP has a block of 512 addresses. It needs to divide the address among 512 customers. Does it need subnetting? Justify your answer.

c) Consider the following 7 node network where each node represents a department. Apply Bellman Ford Equation and calculate the cost of least cost path from CSE to S&H. 4



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

	d)	State True or False for the following statements. 1. ICMP messages are carried as IP payload. 2. DHCP uses TCP. 3. In the dual stack approach for transition from IPV4 to IPv6, two IPv6 enabled nodes cannot send IPv4 datagrams to each other. 4. The NAT enabled router does not look like a router to the outside world.	4
5	a)	What are the different MAC protocols? Using a flow chart, explain CSMA/CD algorithm.	5
	b)	In an organization, Anushka wants to transfer a message to Virat. The binary form of the message is 1101. Divisor given by the algorithm is 1011. No of redundant bits, r=3. Apply the CRC technique and, 1) Generate a codeword at sender side. 2) Check at receiver side whether the message received is same or the altered one. Justify your answer.	5
	c)	What is Ethernet? To which OSI Layer does Ethernet belong? Draw the frame structure of Ethernet and mention the size of each field in bytes.	4
	d)	Write Short notes on: a) Virtual Local Area Networks b) Link Layer Switches	6