Total number of printed pages: **Programme(UG)/Semester VII/UECE602**

2023

Computer Networks

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions.*

1.	a)	Describe the internet as a connectionless datagram switching network.	5
	b)	What are the differences between classful addressing and classless addressing in IPv4? What are the flaws in classful addressing?	5+2=7
	c)	Explain the IPv4 datagram header format.	8
2.	a)	Define fragmentation and explain why the IPv4 protocol needs to fragment some packets?	6
	b)	Which fields of the IPv4 header do change from router to router and why?	3
	c)	An IPv4 datagram is carrying 1024 bytes of data. If there is no option information, what is the value of the header length field? What is the value of the total length field?	3
	d)	Explain the ATM architecture. What are the various ATM layers? What are their responsibilities?	8
3.	a)	i) An Ethernet MAC sublayer received 32 bytes of data from the upper layer. How many bytes of padding must be added to the payload?	2+3=5

		ii) An Ethernet MAC sublayer received 2500 bytes of data from the upper layer. Can the data be encapsulated in one frame? If not, how many frames need to be sent? What is the size of data in each frame?	
	b)	Explain with a neat diagram, connection establishment in TCP using three-way handshaking. What is SYN flooding attack?	7+3=10
	c)	Write down the responsibilities of presentation layer.	5
4.	a)	An IPv4 fragment has arrived with an offset value of 100. How many bytes of data were originally sent by the source before the data in this fragment?	5
	b)	What do you mean by congestion control? Name some open-loop and closed-loop congestion control techniques. Discuss any two of these techniques.	10
	c)	Draw the TCP/IP protocol suite showing the protocols in each layer. Differentiate between TCP and IP.	5
5.	a)	Why do we need a DNS system when we can directly use an IP address? Explain the different types of DNS used in the internet.	2+7=9
	b)	Describe World Wide Web (WWW) as a client/server architecture. Discuss HTML and HTTP in this context.	9
	c)	A packet has arrived with an M bit value of 1 and a fragmentation offset value of 0. Is this the first fragment, the last fragment, or a middle fragment?	2
6.	a)	Describe a general architecture of Electronic Mail.	6
	b)	Find the first address, last address and the block size of the following block- 200.17.21.128/27.	6

	c)	What do you mean by resolution and resolver? Differentiate between recursive resolution and iterative resolution.	8
7.		Write short notes on -i) OSI reference model, services and protocols, ii) Asynchronous TDM and ATM cell, iii) FDDI, iv) HDLC.	5*4=20