Roll No. | | | | | | | | | | |

B.E (FULL TIME) DEGREE END SEMESTER EXAMINATION, APR/MAY 2024

ELECTRONICS AND COMMUNICATION ENGINEERING

EC5602 – COMMUNICATION NETWORKS

SEMESTER VI

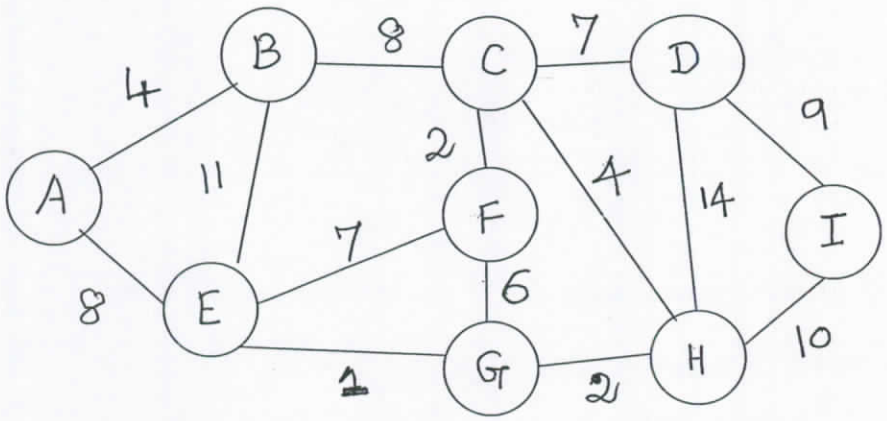
REGULATION 2019

Time:3 Hours | Answer all Questions | Max.Marks: 100

CO1	To introduce the relevance of this course to the existing technology through demonstrations, case studies, simulations, contributions of scientist, national/international policies with a futuristic vision along with socio-economic impact and issues
CO2	To introduce the layered communication architectures
CO3	To understand various physical, data link and routing layer protocols
CO4	To understand application layer protocols and security issues.
CO5	To understand various digital switching techniques.

BL-Bloom's Taxonomy Levels
(L1- Remembering, L2- Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

Sl.No	Questions	Marks	CO	BL
	PART A (10 x 2 = 20 Marks)			
1.	What is Protocol data unit (PDU)?	2	1	2
2.	For 100 devices in a network, how many cable links are required for a mesh, ring, bus and star topology?	2	1	2
3.	Define piggybacking and its benefits.	2	2	1
4.	A channel has a data rate of 4kbps and a propagation delay of 20 msec. For what range of frame sizes does stop and wait give an efficiency of at least 50%.	2	2	2
5.	What are the differences between circuit switching and virtual circuit switching approach to packet switching?	2	3	2
6.	Find the error, if any in the following IPV4 addresses i) 111.56.045.78 ii) 221.34.7.8.20 iii) 75.45.301.14 iv) 11100010.23.14.67	2	3	2
7.	What is a URL and what are its components?	2	4	1
8.	List any two goals of network security with proper justification.	2	4	2
9.	What are the limitations of space division switch?	2	5	2
10.	Why do we employ combination switching scheme such as TST?	2	5	2
	PART B (5 x 13 = 65 Marks)			
11.a	i) Draw the OSI architecture and explain the functionalities of each layer in detail.	9	1	1
	ii) Explain the transmission impairments in the communication networks.	4	1	2
	(OR)			
11. b	i) Draw the TCP/IP protocol suite and explain the functionalities of each layer.	9	1	1
	ii) Discuss various transmission medium in communication networks.	4	1	2

12.a	i) Explain various random access methods in detail	9	2	1
	ii) A slotted Aloha network transmits 200 bit frames using a shared channel with a 200-kbps bandwidth. Find the throughput if the system (all station together) produces A) 1000 frames per second B) 500 frames per second	4	2	2
	(OR)			
12. b	i) Discuss the frame structure of HDLC in detail.	9	2	1
	ii) Assume we have four stations 1, 2, 3 and 4 are connected to the same channel. The data from station 1 are d1,from station 2 are d2, and so on .The code assigned to each station are c1 = [+1 +1 +1 +1], c2 = [+1+1,+1-1], c3 = [+1 +1 -1 -1] and c4 = [+1 -1 -1 +1]	4	2	2
13.a	Draw and explain the header format of ARP and RARP, compare ARP and RARP.	13	3	2
	(OR)			
13 b	Explain the congestion control algorithm and also explain Qos improvement in the network.	13	3	2
14.a	Explain the connection establishment, connection termination and data transfer in TCP.	13	4	2
	(OR)			
14. b	Write short notes on i) www ii) HTTP iii) TELNET	5 4 4	4 4 4	2 2 2
15.a	Describe the STS and TST switching techniques and compare the implementation complexity of both the techniques.	13	5	2
	(OR)			
15. b	Explain in detail about the Digital cross connect system with relevant diagram.	13	5	2
	PART C (1 x 15 = 15 Marks) (Compulsory)			
16.	i) A bit stream 10011101 is transmitted using the standard CRC method. The generated polynomial is $X^3 + 1$. Show the actual bit string transmitted. Suppose the third bit from the left is inverted during transmission .Show that this error is detected at the receiver's end.	5	3	3
	ii) Consider the network shown in figure given below, compute the shortest path from node **A** to all other nodes using link state routing algorithm. 	10	3	3