Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 7006

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – MAY / JUNE 2024
Sixth Semester
Electronics and Communication Engineering
U19EC626 – COMPUTER NETWORKS
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

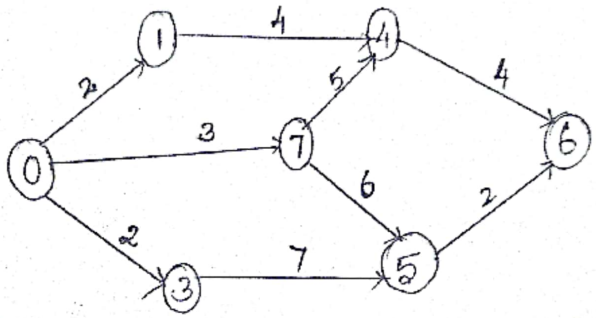
(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	List the three types of access networks used to connect users to the internet.	2	K1	CO1
2.	Compare and contrast circuit switching and packet switching networks in terms of delay and efficiency.	2	K4	CO1
3.	Infer the purpose of a MAC address in the Link Layer.	2	K1	CO2
4.	Recall the significance of sliding window concept in Selective Repeat ARQ.	2	K1	CO2
5.	List three common routing protocols used in the internet.	2	K1	CO3
6.	A block of addresses is granted to a small organization. If the IP address of one host is 205.16.37.39/28. Interpret the first address, last address and number of addresses in the block.	2	K2	CO3
7.	List the four uses of UDP at transport layer.	2	K1	CO4
8.	Compare connectionless and connection oriented services at transport layer.	2	K2	CO4
9.	Extend the functionalities of message transfer agents to transfer an E-mail using SMTP.	2	K2	CO5
10.	Classify traditional ciphers for symmetric key cryptography.	2	K4	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11. (a)	i.	Analyze the role of each layer in the OSI model and how they work together to facilitate communication between devices.	6	K4	CO1
	ii.	Describe the appropriate physical media (e.g., twisted pair, fiber optic) for connecting a home user to the internet based on specific needs.	7	K5	CO1
		(OR)			
b)	i.	Evaluate the impact of delay and loss on different network applications (e.g., real-time video calls vs. file downloads).	7	K5	CO1
	ii.	Compare and contrast the routing protocols used in datagram and virtual circuit networks, explaining their functionalities.	6	K4	CO1
12. a)		Illustrate the concept of stop-and-wait and go-back-n error correction protocols.	13	K2	CO2
		(OR)			
b)		For designing a network for a large office building with numerous devices, summarize the factors you would consider when choosing between an Ethernet switch and a series of connected Ethernet hubs.	13	K2	CO2
13. a)	i.	Apply Dijkstra's algorithm for the following network to formulate the shortest path tree.	7	K3	CO3



	ii.	Infer the instances in which a host knows its physical address, but needs to find its logical address. Identify a suitable protocol for the same at the network layer and brief its operation.	6	K2	CO3
		(OR)			

	b)	i.	Explain the following header fields in IPv4 datagram. a. Time to Live b. Flags	6	K2 CO3
		ii.	Compare and contrast broadcast and multicast routing network.	7	K3 CO3
14.	a)		Summarize the services offered by TCP to the processes at the application layer.	13	K2 CO4
			(OR)		
	b)		Explain the traffic shaping techniques to improve QoS at transport layer.	13	K2 CO4
15.	a)	i.	Should web surfing experience significant performance improvements if HTTP were replaced with a completely new protocol? Justify your answer.	7	K5 CO5
		ii.	Explain the meaning of the following HTTP status code: 404 Not Found.	6	K2 CO5
			(OR)		
	b)	i.	Under what circumstances is FTP still regarded a feasible option for the transfer of files in the present day? Justify your answer.	7	K5 CO5
		ii.	Outline the steps involved in transferring a file from a local machine to an FTP server using command-line tools.	6	K2 CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.			Questions	Marks	KL	CO
16.	a)		Design a secure and efficient network for a smart home environment considering factors like range, security, and data transfer rates. This network needs to connect various devices, including smart TVs, thermostats, security cameras, and smartphones, while ensuring reliable data transmission and protection from cyber threats. For the above scenario, i. Evaluate the role of different network protocols (e.g., TCP, UDP) in supporting various smart home applications, highlighting their suitability for different functionalities (reliable data transfer vs. low latency). ii. Design a network diagram for the smart home, including the main components (router, access points, switches) and their connections to different devices.	15	K5	CO4

(OR)

b)	A university is experiencing rapid growth in the number of students and connected devices. Their current network infrastructure, based on RIP routing and IPv4 addressing, is struggling to handle the increased traffic and limited address space. The university is considering upgrading their network to address these challenges. For the above scenario,	15	K5	CO3

i. What are the limitations of using RIP as a routing protocol in the university's expanding network?

ii. Which routing protocol, Link-State (e.g., OSPF) or Distance Vector (e.g., BGP), would be more suitable for the upgraded network and Justify? Consider factors like scalability and convergence speed.

iii. How would implementing multicast routing benefit the university network, considering scenarios like online lectures or software updates?