Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Science / Engineering

End Sem Examination Dec 2024

CA3CO10 Computer Networks

Programme: BCA / BCA-MCA (Integrated) Branch/Specialisation: Computer Application

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	PO	CO	PSO
Q.1	i.	Which layer of the OSI model is responsible for end-to-end communication? (a) Physical (b) Data link (c) Transport (d) Application	**1**	2	1, 3	1	
	ii.	In the TCP/IP model, which layer corresponds to the OSI model's Network layer? (a) Application (b) Internet (c) Transport (d) Link	**1**	1	1, 3	1	
	iii.	Which of the following is NOT a type of guided transmission media? (a) Twisted pair (b) Coaxial cable (c) Fiber optics (d) Radio waves	**1**	1	1, 3	1	
	iv.	What is the primary advantage of fiber optic cables over traditional copper cables? (a) Lower cost (b) Higher bandwidth and longer distance transmission (c) Easier installation (d) Compatibility with existing infrastructure	**1**	1	1, 3	1	
	v.	What is the primary purpose of error detecting codes in data communication? (a) To correct errors (b) To identify the presence of errors (c) To increase transmission speed (d) To reduce the bandwidth	**1**	1	1, 3	2	

P.T.O.

vi.	Which of the following protocols allows multiple stations to communicate over the same channel without collisions? (a) Aloha (b) Go-Back-N (c) Stop-and-Wait (d) Selective Repeat	**1**	1	1, 3	2		
vii.	What is the primary function of the network layer in the OSI model? (a) Ensuring error-free transmission (b) Routing data packets across networks (c) Providing user interfaces (d) Managing physical connections	**1**	1	1, 3	2		
viii.	Which of the following field in IPv4 datagram is not related to fragmentation? (a) Flags (b) Offset (c) TOS (d) Identifier	**1**	1	1, 3	2		
ix.	Which of the following is a key characteristic of the User Datagram Protocol (UDP)? (a) Connection-oriented (b) Reliable delivery (c) Low overhead (d) Error recovery	**1**	1	1, 3	3		
x.	Which of the following regulates the speed of data transfer to prevent network congestion. (a) CRC (b) Token Bucket (c) ALOHA (d) None of these	**1**	1	1, 3	3		
Q.2	i. What is internet? Explain the various hardware components used for internet.	**4**	1	1, 3, 6	1		
	ii. Compare and contrast the OSI and TCP/IP reference models. Discuss the layers, protocols associated with each.	**6**	2	1, 3, 6	1		
OR	iii. Discuss the role of different network hardware devices in managing and facilitating communication between devices.	**6**	2	1, 3, 6	1		
Q.3	i. What are the main components of the electromagnetic spectrum used in wireless transmission? Provide examples of applications for at least three different frequency ranges.	**4**	1	1, 3, 6	1		

	ii. Discuss the characteristics and applications of guided transmission media, including twisted pairs, coaxial cables, and fiber optics. Compare their advantages and disadvantages.	**6**	2	1, 3, 6	1		
OR	iii. Explain the principles of wireless transmission and also discuss about the different types (radio, microwave, infrared).	**6**	2	1, 3, 6	1		
Q.4	i. Explain the concept of a sliding window protocol and how it improves upon the Stop-and-Wait protocol.	**4**	2	1, 3, 6	2		
	ii. Draw and explain the conceptual view of CRC encoder and decoder? If data is "1101011011" and divisor is "$X^3 + X^2 + 1$" then find out the redundant bits using CRC?	**6**	3	1, 3, 6	2		
OR	iii. How performance is improved in Slotted ALOHA protocol compared to Pure ALOHA protocol? Draw and explain procedural flowchart of Pure ALOHA protocol?	**6**	3	1, 3, 6	2		
Q.5	i. Explain the difference between store-and-forward packet switching and circuit switching. What are the advantages and disadvantages of each method?	**4**	2	1, 3, 6	2		
	ii. Draw and explain the datagram format of IPv4?	**6**	3	1, 3, 6	2		
OR	iii. Discuss about the Distance vector Routing Protocol and illustrate its operation through a practical example.	**6**	3	1, 3, 6	2		
Q.6	i. Explain how the Domain Name System (DNS) resolves domain names to IP addresses with a suitable example.	**4**	2	1, 3, 6	3		
	ii. Draw and explain the TCP segment format.	**6**	3	1, 3, 6	3		
OR	iii. Describe the architecture of e-mail system.	**6**	3	1, 3, 6	3		

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Marking Scheme
CA3CO10 Computer Network

Q.1	i)	c) Transport	**1**
	ii)	b) Internet	**1**
	iii)	d) Radio waves	**1**
	iv)	b) Higher bandwidth and longer distance transmission	**1**
	v)	b) To identify the presence of errors	**1**
	vi)	a) Aloha	**1**
	vii)	b) Routing data packets across networks	**1**
	viii)	**C. TOS**	**1**
	ix)	c) Low overhead	**1**
	x)	b) Token Bucket	**1**
Q.2	i.	Discuss the internet 2M its hardware components 2M	**4**
	ii.	Compare and contrast the OSI and TCP/IP reference models. 2M Discuss the layers, protocols associated with each. 4M	**6**
OR	iii.	Discuss the role of different network hardware devices in managing and facilitating communication between devices.	**6**
Q.3	i.	What are the main components of the electromagnetic spectrum used in wireless transmission? 1M Provide examples of applications for at least three different frequency ranges. 3M	**4**
	ii.	Discuss the characteristics and applications of guided transmission media, including twisted pairs, coaxial cables, 4M fiber optics. Compare their advantages and disadvantages. 2M	**6**
OR	iii.	Explain the principles of wireless transmission 3M also discuss about the different types (radio, microwave, infrared). 3M	**6**
Q.4	i.	Explain the concept of a sliding window protocol 2M how it improves upon the Stop-and-Wait protocol. 2M	**4**
	ii.	Draw and explain the conceptual view of CRC encoder and decoder? 3M If data is "1101011011" and divisor is "$X^3 + X^2 + 1$" then find out the redundant bits using CRC? **(CRC=101) 3M**	**6**
OR	iii.	How performance is improved in Slotted ALOHA protocol compared to Pure ALOHA protocol? 2M Draw and explain procedural flowchart of Pure ALOHA protocol? 4M	**6**
Q.5	i.	Explain the difference between store-and-forward packet switching and circuit switching. 3M What are the advantages and disadvantages of each method? 1M	**4**
	ii.	Draw the explain the datagram format of IPv4?	**6**
OR	iii.	Discuss about the Distance vector Routing Protocol 4M illustrate its operation through a practical example. 2M	**6**
Q.6	i.	Explain how the Domain Name System (DNS) resolves domain names to IP addresses with a suitable example.	**4**
	ii.	Draw 2M explain the TCP segment format. 4M	**6**
OR	iii.	Describe the architecture of e-mail system.	**6**

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