

Enrollment No.....



Faculty of Engineering  
End Sem (Odd) Examination Dec-2019  
IT3CO10 Computer Networks

Programme: B.Tech.

Branch/Specialisation: IT

**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.

- Q.1
- i. Transmission media lie below the \_\_\_\_\_ layer. **1**  
(a) Physical (b) Network (c) Transport (d) Application
  - ii. Number of wires required in Mesh topology network for n nodes **1**  
(a) n (b) n\*2 (c) n(n-1)/2 (d) None of these
  - iii. In the Go-Back-N protocol, the maximum send window size is **1**  
\_\_\_\_\_ and the maximum receive window size is \_\_\_\_\_, where  
m is related to the number of bits in the sequence number.  
(a) 1; 1 (b) 1; 2<sup>m</sup> (c) 2<sup>m</sup> - 1; 1 (d) 2<sup>m</sup> - 1; 2<sup>m</sup> - 1
  - iv. If the ASCII character G is sent and the character D is received, **1**  
what type of error is this?  
(a) Single-bit (b) Multiple-bit  
(c) Burst (d) Recoverable
  - v. In the p-persistent approach, when a station finds an idle line, it **1**  
\_\_\_\_\_.  
(a) Sends immediately  
(b) Sends with probability p  
(c) Sends with probability 1 - p  
(d) Waits 1 s before sending
  - vi. The minimum frame length for Ethernet is \_\_\_\_\_ bytes. **1**  
(a) 32 (b) 80 (c) 128 (d) None of these
  - vii. Routers in the path are not allowed to \_\_\_\_\_. **1**  
(a) Fragment the packet they receive  
(b) Decapsulate the packet  
(c) Change source or destination address  
(d) All of these

[2]

- viii. An HLEN value of decimal 10 means \_\_\_\_\_. **1**  
(a) There are 10 bytes of options  
(b) There are 10 bytes in the header  
(c) There are 40 bytes of options  
(d) There are 40 bytes in the header
- ix. The source port number on the UDP user datagram header defines \_\_\_\_\_. **1**  
(a) The sending computer  
(b) The receiving computer  
(c) The process running on the sending computer  
(d) None of these
- x. In TCP, an ACK segment, if carrying no data, consumes \_\_\_\_\_ sequence number(s). **1**  
(a) No (b) One (c) Two (d) None of these
- Q.2 i. Define computer network. Write its application areas. **2**  
ii. What are different network topologies? Explain. **3**  
iii. Discuss ISO-OSI model in detail. Why it is called reference model? **5**
- OR iv. Describe TCP/IP model in detail. How it is differ from ISO-OSI model? **5**
- Q.3 i. What are different design issues of Data Link Layer? **4**  
ii. A 20 Kbps satellite link has a propagation delay of 400 ms. The transmitter employs the “go back n ARQ” scheme with n set to 10. Assuming that each frame is 100 bytes long, what is the maximum data rate possible? **6**
- OR iii. A 3000 km long trunk operates at 1.536 Mbps and is used to transmit 64 byte frames and uses sliding window protocol. If the propagation speed is 6  $\mu$ sec / km, how many bits should the sequence number field be? How many maximum sequence numbers are possible and also find out how many sequence numbers remains unused? **6**
- Q.4 i. Discuss 802.4 token bus and 802.5 token ring **3**  
ii. How does CSMA / CD work? Justify your answer with suitable diagram. **7**

[3]

- OR iii. What is IEEE 802.3 Ethernet? Draw its frame format and explain. **7**
- Q.5 i. Compare IPv4 and IPv6. **2**  
ii. What is DHCP? Draw its transition diagram and explain. **8**
- OR iii. An IP datagram has arrived with the following information in the header (in hexadecimal): **8**  
45 00 00 54 00 03 00 00 20 06 00 00 7C 4E 03 02 B4 0E 0F 02  
(a) Are there any options?  
(b) Is the packet fragmented?  
(c) What is the size of the data?  
(d) Is a checksum used?  
(e) How many more routers can the packet travel to?  
(f) What is the identification number of the packet?  
(g) What is the type of service?  
(h) What is the size of the header?
- Q.6 Attempt any two: **5**  
i. What is TCP connection establishment and termination process? Explain. **5**  
ii. What is Checksum? How it is calculated in UDP? Justify your answer with example. **5**  
iii. Write short note with suitable diagram on: **5**  
(a) Hypertext Transfer Protocol  
(b) Telnet

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**Marking Scheme**  
**IT3CO10 Computer Networks**

Q.1	i.	Transmission media lie below the _____ layer.	<b>1</b>
		(a) Physical	
	ii.	Number of wires required in Mesh topology network for n nodes	<b>1</b>
		(c) $n(n-1)/2$	
	iii.	In the Go-Back-N protocol, the maximum send window size is _____ and the maximum receive window size is _____, where m is related to the number of bits in the sequence number.	<b>1</b>
		(c) $2^m - 1; 1$	
	iv.	If the ASCII character G is sent and the character D is received, what type of error is this?	<b>1</b>
		(c) Burst	
	v.	In the p-persistent approach, when a station finds an idle line, it _____.	<b>1</b>
		(b) Sends with probability p	
	vi.	The minimum frame length for Ethernet is _____ bytes.	<b>1</b>
		(a) 32            (b) 80            (c) 128            (d) None of these	
	vii.	Routers in the path are not allowed to _____.	<b>1</b>
		(d) All of these	
	viii.	An HLEN value of decimal 10 means _____.	<b>1</b>
		(d) There are 40 bytes in the header	
	ix.	The source port number on the UDP user datagram header defines _____.	<b>1</b>
		(c) The process running on the sending computer	
	x.	In TCP, an ACK segment, if carrying no data, consumes _____ sequence number(s).	<b>1</b>
		(b) One	
Q.2	i.	Defining computer network	1 mark
		Its application areas	1 mark
	ii.	Network topologies	<b>3</b>
		0.5 mark for each topology	(0.5 mark * 6)
	iii.	ISO-OSI model	<b>5</b>
		Diagram	2 marks
		Explanation	2 marks
		Reference model reason	1 mark

OR	iv.	TCP/IP model		<b>5</b>
		Diagram	2 marks	
		Differ from ISO-OSI model	3 marks	
Q.3	i.	Design issues of Data Link Layer		<b>4</b>
		1 mark for each issue	(1 mark * 4)	
	ii.	Transmission delay (Time)	1 mark	<b>6</b>
		Calculating value of 'a'	1 mark	
		Calculating efficiency	2 marks	
		Maximum data rate possible	2 marks	
OR	iii.	Maximum sequence numbers bits	4 marks	<b>6</b>
		Sequence numbers	1 mark	
		Unused sequence numbers	1 mark	
Q.4	i.	802.4 token bus	1.5 marks	<b>3</b>
		802.5 token ring	1.5 marks	
	ii.	CSMA / CD working principle	4 marks	<b>7</b>
		Diagram	3 marks	
OR	iii.	Definition of IEEE 802.3 Ethernet	1 mark	<b>7</b>
		Frame format	3 marks	
		Explanation	3 marks	
Q.5	i.	Compare IPv4 and IPv6.		<b>2</b>
		0.5 mark for each comparison	(0.5 mark * 4)	
	ii.	Definition of DHCP	1 mark	<b>8</b>
		Transition diagram	4 marks	
		Explanation	3 marks	
OR	iii.	An IP datagram has arrived with the following information in the header (in hexadecimal):		<b>8</b>
		45 00 00 54 00 03 00 00 20 06 00 00 7C 4E 03 02 B4 0E 0F 02		
		1 mark for each	(1 mark * 8)	
Q.6		Attempt any two:		
	i.	TCP connection establishment process	1.5 marks	<b>5</b>
		Diagram	1 mark	
		TCP connection termination process	1.5 marks	
		Diagram	1 mark	
	ii.	Definition of Checksum	1 mark	<b>5</b>
		Calculation in UDP using example	4 marks	

iii. Write short note with suitable diagram on:

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(a) Hypertext Transfer Protocol

Description

1.5 marks

Diagram

1 mark

(b) Telnet

Description

1.5 marks

Diagram

1 mark

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