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Code No: 155AV **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, September - 2021
DATA COMMUNICATIONS AND NETWORKS
(Electronics and Communication Engineering)

Time: 3 Hours **Max. Marks: 75**

Answer any five questions
All questions carry equal marks
- - -

1.a) Draw and explain the OSI architecture.
b) Draw and explain the 802.11 architecture. [8+7]

2.a) How to convert a digital signal to analog? Explain with the help of an example.
b) What is meant by Transmission media? Explain the types with a neat diagram for each. [7+8]

3.a) Explain the functioning of FDMA.
b) What are the advantages and disadvantages of Slotted ALOHA? [9+6]

4.a) Calculate and verify the efficiency of Pure ALOHA.
b) What is a collision? How can a collision be detected? Explain about CSMA/ CD. [7+8]

5.a) Explain the frame format of ICMP.
b) Differentiate between static routing and dynamic routing. [8+7]

6.a) Imagine, multiple requests are raised from various clients. How can these requests be handled? Explain in detail.
b) Differentiate between VC network and Datagram Network. [8+7]

7.a) Explain how flow control and buffering would be handled by transport layer.
b) Explain the functioning of RPC. [8+7]

8.a) Draw and explain the steps in looking up a URL when a CDN is used.
b) Draw and explain about the WAP protocol stack. [7+8]

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B. Tech III Year I Semester Examinations, March - 2021
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1.a) How does information get passed from one layer to the next in the Internet model? Explain.
b) Illustrate how CDMA works in wireless LAN. [7+8]

2.a) What is Cyclic Code? Explain the CRC error detection technique.
b) Give a detail note on the Random Access protocols. [8+7]

3.a) Explain the functionality of ICMP protocol.
b) What is the format of IPv4 header? Describe the significance of each field. [7+8]

4.a) Describe why an application developer might choose to run an application over UDP rather than TCP.
b) Demonstrate three way handshake connection establishment in TCP. [7+8]

5.a) Is an application's architecture different from the network architecture? Defend your answer.
b) What is DNS? Explain how DNS works. [8+7]

6.a) Explain the categories of networks.
b) Demonstrate Go Back-N sliding window Protocol with an example. [7+8]

7.a) Explain IEEE 802.11 standard for Ethernet with the help of frame format.
b) Differentiate between pure ALOHA and slotted ALOHA. [8+7]

8. Write a short note on:
a) SMTP
b) HTTP. [8+7]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech III Year I Semester Examinations, January/February - 2023
DATA COMMUNICATIONS AND NETWORKS
(Electronics and Computer Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a) Differentiate between Computer Network and Distributed system. [2]
b) List and define the network criteria. [3]
c) What is framing? [2]
d) A network using CSMA/CD has a bandwidth of 10 Mbps (Standard Ethernet). If the maximum propagation time (including the delays in the devices and ignoring the time needed to send a jamming signal) is 25.6 μs, what is the minimum size of the frame? [3]
e) Differentiate between forwarding and routing. [2]
f) Give a note on classful addressing. [3]
g) What is multiplexing? Explain. [2]
h) Write the differences between UDP and TCP. [3]
i) List the various networking applications offered to the users. [2]
j) Make a comparison of SMTP and HTTP. [3]

PART – B

(50 Marks)

2. Draw the OSI layered model and explain the functionality of each layer. [10]

OR

3.a) How is TCP/IP reference model different from OSI reference model?
b) Explain the different addresses used in the various layers of OSI model. [5+5]

4.a) One way of detecting errors is to transmit data as a block of n rows of k bits per row and adding parity bits to each row and each column. Will this scheme detect all single errors? Double errors? Triple errors? Justify your answer with an example.
b) What is the remainder obtained by dividing x^7+x^5+1 by the generator polynomial x^3+1? [5+5]

OR

5.a) Explain the working of CSMA/CD protocol with a flowchart.
b) What is piggybacking? What are its advantages? [6+4]

6.a) How does routing happens in a Virtual circuit? Explain with an example.
b) Explain various ICMP messages in detail. [5+5]

OR

7.a) What is two node instability problem in Distance vector routing? Suggest a solution.
b) Give a note on IPv6 addresses. [5+5]

8. Draw the format of a TCP segment and explain the significance of each field in detail. [10]

OR

9.a) Differentiate between Go-Back-N and Selective Repeat protocols.
b) Explain the TCP congestion policy. [5+5]

10.a) Explain in detail FTP commands and Replies.
b) What is Name address resolution? Discuss the two ways of resolving the same with examples. [5+5]

OR

11.a) Give a detailed note on Email.
b) Give an overview of how DNS works. [5+5]

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PART – A

(25 Marks)

1.a)	What is the difference between simplex and half duplex dataflow?	[2]
b)	Analyze the differences between logical address and physical address.	[3]
c)	What is framing? Give an example for bit stuffing.	[2]
d)	Compare the difference between Datagram switching and Packet Switching.	[3]
e)	What is Subnet masking? Provide subnet mask for Class A and Class C.	[2]
f)	Briefly explain about RARP, DHCP protocols.	[3]
g)	What is Socket address? Explain how it is related to IP address.	[2]
h)	Explain the functionalities of Transport Layer.	[3]
i)	What is MIME protocols?	[2]
j)	Briefly explain about DNS protocol.	[3]

PART – B

(50 Marks)

2.a) Compare the TCP/IP and OSI layer models.
b) Explain various network topologies with drawbacks. [5+5]

OR

3. With a neat diagram, explain the OSI reference model in detail. Explain the functions performed in each layer. [10]

4. What do you understand by error control? Explain about Hamming code with suitable example. [10]

OR

5.a) What is controlled access? Explain Polling and Token passing methods.
b) Analyze how Slotted ALOHA better than Pure ALOHA. [5+5]

6. Consider a network with nodes A, B, C, D, E, F, G, H where the distance between the nodes is as follows: A→B is 6, A→C is 5, A→D IS 3, B→E is 2, B→F is 8, C→E is 4, D→G is 5, E→G is 3, E→H is 7, E→F is 2, F→H is 5, G→H is 6. Apply Shortest path routing protocol to find the shortest path between source A to destination H. [10]

OR

7.a) Consider a Network of 400 number of nodes. The network has divided into three subnets. The staring address of the network is 192.172.0.0 then find out the each subnet address range with Mask.
b) What is purpose of ICMP? Explain its messages in detail. [6+4]

8.a) Differentiate between UDP and TCP.
b) Describe the working principle of TCP congestion control. [5+5]

OR

9. Determine various fields of the TCP header and the working procedure of the TCP protocol. [10]

10. Explain the salient features and functionality of the SMTP protocol. [10]

OR

11.a) What is FTP? What are the three transmission modes in FTP? Discuss.
b) How HTTP differs from HTTPS? Explain. [5+5]

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1. During the communication, how the various layers exchange information in OSI Model. Describe with the help of suitable diagram. [15]

2. Explain the TCP/IP architecture. Show the comparison with the OSI model with the help of schematic diagram. [15]

3. Consider a message D, presented by the following polynomial $x^{19} + x^{17} + x^{16} + x^{13} + x^{12} + x^{11} + x^9 + x^5 + x^2 + 1$, which is transmitted using the standard Cyclic Redundancy Check (CRC) method. The generator polynomial is $x^7 + x^5 + x^4 + x^3 + x^2 + 1$. Find the CRC and show the actual bit string to be transmitted. [15]

4.a) Differentiate between Pure ALOHA and slotted ALOHA protocol.
b) In a digital system with 8 input links are multiplexed using STDM. Each input source is creating 1024 bits per second. Each frame contains 8 bits from each source and adds 1 bit as a framing bit. Compute the number of frame transmitted per second and the data capacity of the link. [7+8]

5.a) Explain the network service model with a neat sketch.
b) Explain the format of IPV4 addressing. [8+7]

6. Illustrate in detail about the concept of forwarding and addressing in the internet. [15]

7.a) Discuss about the Round-Trip Time Estimation and Timeout.
b) Why does UDP exist? Would it not have been enough to just let user processes send raw IP packets? Justify answer. [8+7]

8. Explain the Transport Services Available to Applications. [15]

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