DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Rajshahi University

Course Code: CSE3151 Course Title: Computer Networks

(B.Sc. Engineering Part III Odd Semester Examination-2020)

Time: 03 Hours Full Marks: 52.50

SECTION A

ANSWER ANY THREE OF THE FOLLOWINGS

1.(a) How the term "Computer Networks" is defined in literature? 5th page note copy [1.75]

(b) How "distributed system" is different from a "computer network"? 5th page note copy [2.00]

(c) Can we classify computer networks by its' scale? How? 5th page note copy [3.00]

(d) It is said that the primary goal of a computer network is resource sharing. Can you explain it? 5th page note copy [2.00]

2.(a) Distinguish between broadcasting and multicasting. copy pg-26 [1.00]

(b) What are the design issues that are applicable for a Physical layer design? wk1-3 pg-9 [2.75]

(c) What do you think about the reasons for the failure of the OSI reference model? wk1-4 pg-5,6 [3.00]

(d) Have you heard the term ARPANET? What is it? wk 1-4 pg-13-18 [2.00]

3.(a) Compare between CSMA/CA and CSMA/CD. ICE lect-4 pg-27 [3.00]

(b) Write down advantages and disadvantages of following transmissions [4.00]

i. Asynchronous transmission copy pg-35

ii. Synchronous transmission

(c) Define quality of service with respect to transport layer. [1.75]

4.(a) What do you know about GEO, MEO, and LEO satellite? Our only Satellite, the Bangabandhu Satellite-1 (BS-1) falls in which category? [3.00]

(b) Explain how "Hamming Code" can be used as an error correction mechanism? [4.75]

(c) Can you explain the mechanism of data transfer of "Relaying in space" and "Relaying on the ground" for satellite communication? copy page 38 [1.00]

SECTION B

ANSWER ANY THREE OF THE FOLLOWINGS

5.(a) Distinguish between port address and IP address. my note pg-53 [1.50]

(b) What is VLAN? What are advantages and disadvantages of creating VLAN within a network? my note pg-53b [1+4]

Write soon

(c) What is network-switching loop? How could it affect a network? my note pg-54 [2.25]

6.(a) What do you know about the Flooding routing technique? my note 60 [2.75]

(b) What is known as the Optimality Principle? book -364 [2.00]

(c) Elaborate the working procedure of the distance vector routing algorithm with an example. book - 370 [4.00]

[3x2]

7.(a) Distinguish between the following components
i) Wireless router and Wi-Fi access point -my note-67b
ii) Switch and hub
iii) Circuit switching and packet switching ICE Lecture-3

(b) Which layer of the ISO-OSI reference model performs data encryption? Why data encryption is not possible in other layers? [2.75]

[8.75]

8. A University has two administrative and several academic buildings, residence halls and employees quarters. All the buildings are connected to a central network distribution point via optical fiber network. The university has several network components like router, firewall, layer-3 and layer-2 switches, media converters, unmanaged switches, hubs, Wi-Fi access points, Wi-Fi access controller and network firewall. Furthermore it also has its own web server, mail server, DNS server, database server, network storage and application server. The university has two redundant Internet connections from two different ISPs. The university provides Internet connectivity to all the students and employees. The application server can only be accessed from the administrative and academic buildings. Draw and explain a conceptual network diagram for the above network.

2. d)
https://www.tutorialspoint.com/csma-with-collision-detection-csma-cd#:~:text=Carrier%20Sense%20Multiple%20Access%20with,until%20the%20channel%20is%20free.

University of Rajshahi
Department of Computer Science and Engineering
B.Sc. (Engg.) Part-III, Odd Semester, Examination-2019
Course: CSE 3151 (Computer Networks)
Marks: 52.50 Time: 3 Hours
[Answer six (06) questions by taking any three (03) from each section]

Section-A

1. a) Define Internet protocol and standard. 8th page note copy 1.5
   b) Describe some of the key design issues that occur in computer network layers. 8th page note copy 4.25
   c) What are the principal differences between connectionless communication and connection-oriented communication? 8th page note copy 2
   d) How does OSI differentiate to ISO? 8th page note copy 1

2. a) Which network layers are needed addresse and which do/does not? Why? 3
   b) Define MAC address. Define the type of the following destination addresses: 2
      i) 4A:30:10:21:10:1A
      ii) 47:20:1B:2E:08:EE
      iii) FF:FF:FF:FF:FF:FF
   c) In the standard Ethernet, if the maximum propagation time is 25.6μs, what is the minimum size of the frame? 1
   d) Describe the CSMA/CD flow diagram. ICE lecture-4 pg-26 copy pg-27 2.75

3. a) Differentiate between packet switching and circuit switching. ice lecture-3 2.75
   b) Describe an architecture of an ATM network and various ATM layers. mid pg-7 ice lect-6 4
   c) When padding is required to form a Ethernet frame? What are the reasons for restricting the maximum Ethernet frame length to 1500 bytes? 2

4. a) Describe the significance of error detection and error correction mechanisms in data link layer. 2
   b) Explain elementary data link layer protocols. 3
   c) Compare various sliding window protocols of data link layer. 3.75

Section-B

5. a) Why is it necessary to have a routine table in a router of host? Discuss several techniques to manage and handle routine table. Find and write about the error, if any, in the following IPv4 addresses: 3.75
      i) 111.56.066.87
      ii) 111.34.5.6.30
      iii) 75.45.257.14
      iv) 00001111.3.14.15
   Write soon
   my note pg-54b
   b) Find the number of addresses in a range if the first address is 146.102.29.0 and the last address is 146.102.32.245 1
   my copy pg-55
   c) Discuss the problems associated with classful addressing for each five classes in IP address space. 4

6. a) One of the addresses in a block is 17.63.110.114/24. Find the number of addresses, the first address and the last address in the block. 2

b) Discuss packet forwarding based on destination address with classful addressing. 3.75

c) i) Make a routing table for router R1 using the configuration in Figure-1. 1+2

ii) Show the forwarding process if a packet arrives at R1 in Figure-1 with the destination address 201.4.22.35.

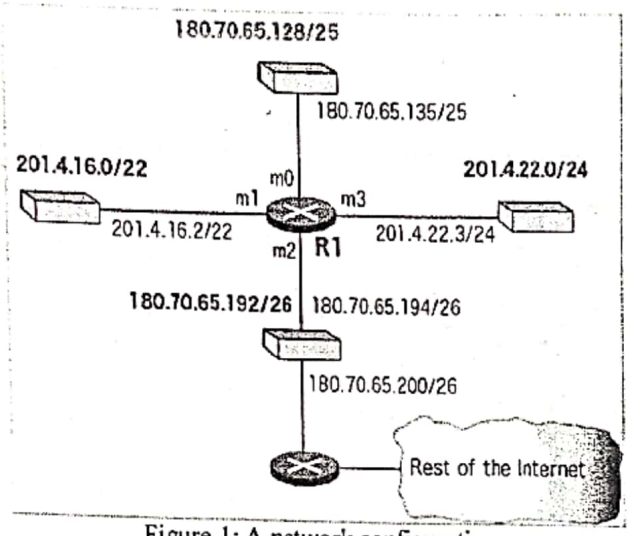

Figure-1: A network configuration.

7. a) Distinguish between static and dynamic address mapping. 2.75

b) Show the position of ARP in the TCP/IP protocol suite using a diagram. Describe each field in an ARP packet. 4

c) Describe about ICMP error reporting message. 2

8. a) What are the different request types available in HTTP? Explain. get, post, put, patch, delete 2.75

b) Describe briefly about the Architecture of WWW. 3

c) Explain the message using SMTP. 3