# Dept. of Computer and Communication Engineering
Patuakhali Science and Technology University
5th Semester (Level-3, Semester-I), Mid Examination of B.Sc. Engg. (CSE), January-June: 2022
Course Code: CCE313 Course Title: Computer Networks
Credit Hour: 3.0   Full Marks: 15   Time: 60 minutes

24

01. Find the netid, subnet mask and the hostid of the following IP addresses:   **2**
    a. 114.34.2.8    b. 132.56.8.6    c. 208.34.54.12    d. 251.34.98.5
02. An address in a block is given as 191.8.243.9. Find the number of addresses in the block, subnet   **3**
    mask the first address, and the last address.
03. A company is granted the site address 201.70.64.0. The company needs six subnets. Design the   **3**
    subnets and shows the first address and last address with subnetmask through a pictorial
    representation.
04. What are the services that a transport-layer protocol cannot provide to applications invoking it?   **2**
    throughput, security, time, integrity
05. How can an application use the services of TLS? TCP   **2**
06. Describe how installing a proxy server can reduce the delay in receiving a requested object.   **3**

(12)

Dept. of Computer and Communication Engineering
Faculty of Computer Science and Engineering
Patuakhali Science and Technology University
Dumki, Patuakhali-8602, Bangladesh

**Final Examination of B. Sc. Engineering in CSE Level: 3 Semester: I Session: 2019-2020**

| Course Code | Course Title | January-June 2022 | Credit: 03 |
|---|---|---|---|
| CCE 313 | Computer Network | | Time: 03 Hr  Marks: 70 |

Answer any 05 out of 06 Questions (Split answers are highly discouraged)

1 **[A.]** Consider the queuing delay in a router buffer, where the packet experiences a delay as it waits to be transmitted    4
onto the link. The length of the queuing delay of a specific packet will depend on the number of earlier-arriving
packets that are queued and waiting for transmission onto the link. If the queue is empty and no other packet is
currently being transmitted, then our packet's queuing delay will be zero. On the other hand, if the traffic is
heavy and many other packets are also waiting to be transmitted, the queuing delay will be long.  Assume a
constant transmission rate of R = 300000 bps, a constant packet-length L = 4600 bits, and a is the average rate
of packets/second. Traffic intensity I = La/R, and the queuing delay is calculated as I(L/R)(1 - I) for I < 1.
i. In practice, does the queuing delay tend to vary a lot? Answer with Yes or No and why?
ii. Assuming that a = 28, what is the queuing delay?
iii. Assuming the router's buffer is infinite, the queuing delay is 0.4357 ms, and 1218 packets arrive. How
many packets will be in the buffer 1 second later?
iv. If the buffer has a maximum size of 563 packets, how many of the 1218 packets would be dropped upon
arrival from the previous question?

**[B.]** Some content providers have created their own networks. Describe Google's network. What motivates content    3
providers to create these networks?

**[C.]** i. What is an application-layer message? A transport-layer segment? A network-layer datagram? A link-layer    4
frame?
ii. HFC, DSL, and FTTH are all used for residential access. For each of these access technologies, provide a
range of transmission rates and comment on whether the transmission rate is shared or dedicated.
iii. In this problem, we consider sending real-time voice from Host A to Host B over a packet-switched network    3
(VoIP). Host A convert's analog voice to a digital 64 kbps bit stream on the fly. Host A then groups the bits
into 56-byte packets. There is one link between Hosts A and B; its transmission rate is 10 Mbps and its
propagation delay is 10 msec. As soon as Host A gathers a packet, it sends it to Host B. As soon as Host B
receives an entire packet, it converts the packet's bits to an analog signal. How much time elapses from the
time a bit is created (from the original analog signal at Host A) until the bit is decoded (as part of the analog
signal at Host B)?

2 **[A.]** "For the proper operation of the CIDR, three restrictions need to be applied to the allocated block" justify this    3
statement.

**[B.]** An organization is granted the block 130.34.12.64/26. The organization needs four subnetworks, each with an    4
equal number of hosts. Design the subnetworks and find the information about each network.

**[C.]** An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to    5
2600 customers as follows:
i. The first group has 200 medium-size businesses; each needs approximately 128 addresses.
ii. The second group has 400 small businesses; each needs approximately 16 addresses.
iii. The third group has 2000 households; each needs 4 addresses.
Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still
available after these allocations.

**[D.]** "Four levels of addresses are used in an internet employing the TCP/IP protocols and each address is related    2
to a one layer in the TCP/IP architecture" justify this statement.

3 **[A.]** i. You have an interface on a router with the IP address of 192.168.192.10/29. What is the broadcast address    6
the hosts will use on this LAN?
ii. What is the last valid host on the subnetwork 165.21.80.128/26?
iii. In fixed-length subnetting, find the number of 1's that must be added to the mask if the number of desired
subnets will be 2 and 122.

**[B.]** Construct least-cost-path tree by tracing predecessor nodes. Also find out    5
the resulting least-cost-path tree from u and also show the resulting
forwarding table in u:
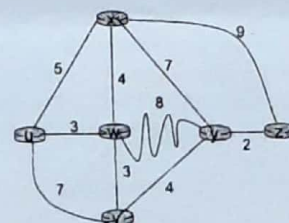


**[C.]** i. When the algorithm converges, what are the distance vectors from router    3
'Y' to all routers? Write your answer as u,v,w,x,y.
ii. What are the initial distance vectors for router 'W'? Write your answer as
u,v,w,x,y and if a distance is ∞,  write 'x'.
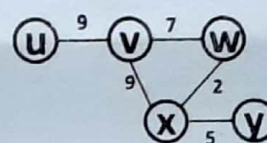
4  [A.] TCP opens a connection using an initial sequence number (ISN) of 14,534. The other party opens the connection with an ISN of 21,732.

    i. Show the three TCP segments during the connection establishment.

    ii. Show the contents of the segments during the data transmission if the initiator sends a segment containing the message "Hello dear customer" and the other party answers with a segment containing "Hi there seller."

    iii. Show the contents of the segments during the connection termination.

  [B.] The following is a dump of a UDP header in hexadecimal format:

    **CB84000D001C001C**

    i. What is the source port number?        ii. What is the destination port number?

    iii. What is the total length of the user datagram?    iv. What is the length of the data?

    v. Is the packet directed from a client to a server or vice versa?    vi. What is the client process?

  [C.] A TCP connection is using a window size of 10,000 bytes and the previous acknowledgment number was 22,001. It receives a segment with acknowledgment number 24,001 and window size advertisement of 12,000. Draw a diagram to show the situation of the window before and after.

  [D.] Suppose you wanted to do a transaction from a remote client to a server as fast as possible. Would you use UDP or TCP? Why?

5  [A.] A DNS client is looking for the IP addresses corresponding to xxx.yyy.com and aaa.bbb.edu. Show the query message. Also, Show the response message of the DNS server to this query if the addresses are 14.23.45.12 and 131.34.67.89.

  [B.] Consider distributing a file of $F = 20$ Gbits to $N$ peers. The server has an upload rate of $us = 30$ Mbps, and each peer has a download rate of $di = 2$ Mbps and an upload rate of $u$. For $N = 10$, 100, and 1,000 and $u = 300$ Kbps, 700 Kbps, and 2 Mbps, prepare a chart giving the minimum distribution time for each of the combinations of $N$ and $u$ for both client-server distribution and P2P distribution.

  [C.] Suppose a content provider employs a third-party CDN company to distribute its videos to its customers. How are DASH and DNS used to direct a user's request to the CDN server? Explain the steps with proper illustration.

  [D.] Encode the following message in quoted-printable:

    **01010111 00001111 11110000 10101111 01110001 01010100**

6  [A.] Consider the following string of ASCII characters that were captured by Wireshark when the browser sent an HTTP GET message (i.e., this is the actual content of an HTTP GET message). The characters <cr><lf> are carriage return and line-feed characters (that is, the italized character string <cr> in the text below represents the single carriage-return character that was contained at that point in the HTTP header). Answer the following questions, indicating where in the HTTP GET message below you find the answer.

    GET /cs453/index.html HTTP/1.1<cr><lf>Host: gaia.cs.umass.edu<cr><lf>User-Agent: Mozilla/5.0 (Windows;U; Windows NT 5.1; en-US; rv:1.7.2) Gecko/20040804 Netscape/7.2 (ax)<cr><lf> Accept:ext/xml, application/xml, application/xhtml+xml, text/html;q=0.9, text/plain;q=0.8,image/png,*/*;q=0.5 <cr><lf>Accept-Language: en-us,en;q=0.5<cr><lf>Accept-Encoding: zip,deflate<cr><lf> Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7<cr><lf>Keep-Alive: 300<cr><lf>Connection:keep-alive<cr><lf><cr><lf>

    i. What is the URL of the document requested by the browser?

    ii. What version of HTTP is the browser running?

    iii. Does the browser request a non-persistent or a persistent connection?

    iv. What is the IP address of the host on which the browser is running?

    v. What type of browser initiates this message?

    vi. Why is the browser type needed in an HTTP request message?

  [B.] The text below shows the reply sent from the server in response to the HTTP GET message in the question above. Answer the following questions, indicating where in the message below you find the answer.

    HTTP/1.1 200 OK<cr><lf>Date: Tue, 07 Mar 2008 12:39:45GMT<cr><lf>Server: Apache/2.0.52 (Fedora)<cr><lf>Last-Modified: Sat, 10 Dec2005 18:27:46 GMT<cr><lf>ETag: "526c3-f22-a88a4c80"<cr><lf>Accept-Ranges: bytes<cr><lf>Content-Length: 3874<cr><lf>Keep-Alive: timeout=max=100<cr><lf> Connection:Keep Alive<cr><lf>Content-Type: text/html; charset= ISO-8859-1<cr><lf><cr><lf><ldoctype html public "-//w3c//dtd html 4.0 transitional//en"><lf> <html><lf><head><lf> <meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1"><lf> <metaname="GENERATOR" content="Mozilla/4.79 [en] (Windows NT 5.0; U) Netscape]"><lf> <title>CMPSCI 453 / 591 /NTU-ST550ASpring 2005 homepage</title><lf></head><lf><much more document text following here (not shown)>

    i. Was the server able to successfully find the document or not? What time was the document reply provided?

    ii. When the document was last modified?

    iii. How many bytes are there in the document being returned?

    iv. What are the first 5 bytes of the document being returned? Did the server agree to a persistent connection?

  [C.] What will happen when both sender and receiver use Web servers to transfer email, but not necessarily the same server? Illustrate the scenario.

  [D.] Compare the working principles of YouTube and Netflix.

Dept. of Computer and Communication Engineering
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Mid: I                          Semester: 5<sup>th</sup>             Batch : 15<sup>th</sup>   Marks 15
Course Code: CCE 313     Time: 50 Min  Course Title: Computer Network

1    BTCL  is granted a block of addresses starting with 254.103.0.0/15. The BTCL needs to            1    10
distribute these addresses to three division of customers as follows:
i)        The Dhaka city has 64 customers; each needs approximately 256 addresses.
ii)       The Barisal city has 128 customers; each needs approximately 128 addresses.
iii)   The Khulna city has 128 customers; each needs approximately 256 addresses.
Now design the subblocks and find out how many addresses are still available after these
allocations with diagram.

2    One of the addresses in a block is 167.199.170.82/24. Find the number of addresses in the network, the            5
first address, and the last address with proper procedure.

*Networking*

# Patuakhali Science and Technology University

Faculty of Computer Science and Engineering

Dept. of Computer and Communication Engineering

Mid: I          Semester: 5th          Batch : 16th   Marks 15   Session 2018-2019

Course Code: CCE 313       Time: 55 Min  Course Title: Computer Network

1. An classful address in a block is given as 222.8.17.9. Find the number of addresses in the block, the first address, and the last address. Draw also the block diagram of this IP address topology.   3

2. Suppose you have given a classful block of IP 140.15.0.0. Now you need to divide this IP block to four subnetwork with equal IP address space of each block. Now extracting the first address last address, subnetwork mask to follow the proper procedure and also draw the diagram of the sub network.   5

3. Suppose Alice, who always accesses the Web using Internet Explorer from her home PC, contacts Amazon.com for the first time. Let us also suppose that in the past she has already visited the eBay site. Now, what will happen, when the request comes into the Amazon Web server for the first time and then one week later? Illustrate the communication process between Alice's browser and the Amazon web server with respect to cookies.   4

4. What is the function of conditional GET?   3
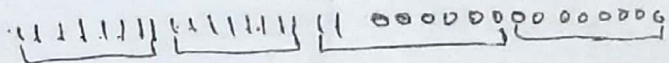
0 - 127 A
128 - 191 B
192 - 223 C
224 - 239
240 - 255

Course Code: CCE 313     Course Title: Computer Networks     Time: 45 minutes

1.) What is the network address in a block of addresses? How can we find the network address if one of the addresses in a block is given?

3

2.) An ISP is granted a block of addresses starting with 120.60.4.0/22. The ISP wants to distribute these blocks to 100 organizations with each organization receiving just eight addresses. Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations.

5

3. In a connection, the value of *cwnd* is 2500 and the value of *rwnd* is 4500. The host has sent 2000 bytes which has not been acknowledged. How many more bytes can be sent?

2

4. A window holds bytes 2001 to 6000. The next byte to be sent is 3001. Draw a figure to show the situation of the window after the following two events:

4

a. An ACK segment with the acknowledgement number 3500 and window size advertisement 4000 is received.

b. A segment carrying 1500 bytes is sent.

5. What is a socket address?

1

## Dept. of Computer and Communication Engineering
### Faculty of Computer Science and Engineering
Patuakhali Science and Technology University
Dumki, Patuakhali-8602, Bangladesh

Final Examination of B. Sc. Engineering in CSE Level: 3 Semester: I Session: 2018-2019

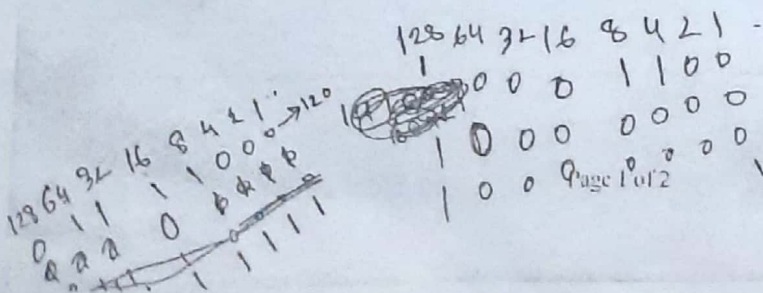| Course Code | Course Title | January-June 2021 | |
|---|---|---|---|
| CCE-313 | Computer Network | | Credit: 03 |
| | | | Time: 03 Hr |
| | | | Marks: 70 |

Answer any 05 out of 06 Questions (Split answers are highly discouraged)

1 [A.] a) Describe the most popular wireless Internet access technologies today. Compare and contrast them. 2+2
b) List four access technologies. Classify each one as home access, enterprise access, or wide-area wireless access.

[B.] Write the duties/services and protocol of each specific OSI layer. 4

[C.] Consider an application that transmits data at a steady rate (for example, the sender generates an N-bit unit of data every k time units, where k is small and fixed). Also, when such an application starts, it will continue running for a relatively long period of time. Answer the following questions, briefly justifying your answer: 3

a. Would a packet-switched network or a circuit-switched network be more appropriate for this application? Why?

b. Suppose that a packet-switched network is used and the only traffic in this network comes from such applications as described above. Furthermore, assume that the sum of the application data rates is less than the capacities of each and every link. Is some form of congestion control needed? Why?

[D.] Suppose Host A wants to send a large file to Host B. The path from Host A to Host B has three links, of rates R1 = 500 kbps, R2 = 2 Mbps, and R3 = 1 Mbps. 3
a. Assuming no other traffic in the network, what is the throughput for the file transfer?
b. Suppose the file is 4 million bytes. Dividing the file size by the throughput, roughly how long will it take to transfer the file to Host B?
c. Repeat (a) and (b), but now with R2 reduced to 100 kbps.

2 [A.] How are the blocks allocated? What are the restrictions need to be applied to the allocated block. 3
[B.] One of the addresses in a block is 110.23.120.14/20. Find the number of addresses, the first address, and the last address in the block. 3
[C.] An organization is granted a block of addresses with the beginning address 254.24.252.0/24. The organization needs to have 4 subblocks of addresses to use in its four subnets as shown below: 6
One subblock of 123 addresses.
One subblock of 62 addresses.
One subblock of 11 addresses.
One subblock of 5 addresses.
[D.] Write the steps need to be carefully followed to guarantee the proper operation of the subnetworks. 2

3 [A.] Discuss the packet forwarding without Subnetting. 3
[B.] Show the forwarding process if a packet arrives at R1 in below Figure with the destination address 180.70.65.140. 3
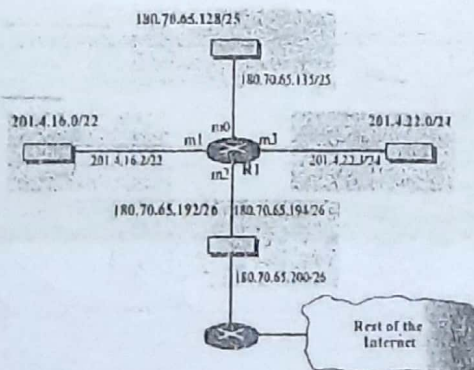


[C.] Compare and contrast the properties of a centralized and a distributed routing algorithm. Give an example of a routing protocol that takes a centralized and a decentralized approach. 3

Page 1 of 2

the server able to successfully find the document or not? What time was the document reply provided?
en the document was last modified?

**[D.]** Consider the following network. With the indicated link costs, use Dijkstra's shortest-path algorithm to compute the shortest path from u to all network nodes. Show how the algorithm works by computing a table.   5
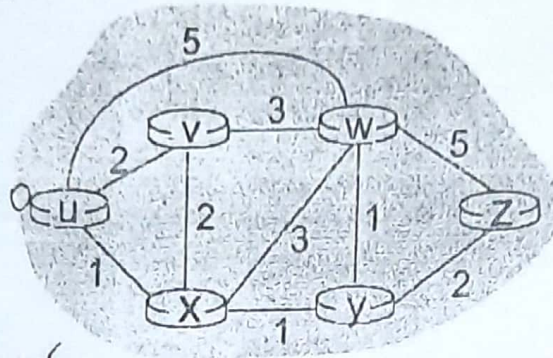


**[A.]** The following is a dump of a UDP header in hexadecimal format.   5
    0045DF000058FF20
    a. What is the source port number?
    b. What is the destination port number?
    c. What is the total length of the user datagram?
    d. What is the length of the data?
    e. Is the packet directed from a client to a server or vice versa?
    f. What is the client process?

**[B.]** How do opening, closing, and shrinking of window occur in TCP? Give examples for both send and receive window.   4

**[C.]** What are the services that a transport-layer protocol can offer to applications invoking it? Describe each with example.   3

**[D.]** A sender sends a JPEG message. Show the MIME header.   2

5 **[A.]** Suppose, An FTP server has received a packet from an FTP client with IP address 153.2.7.9. The FTP server wants to verify that the FTP client is an authorized client. The FTP server can consult a file containing the list of authorized clients. However, the file consists only of domain names. The FTP server has only the IP address of the requesting client, which was the source IP address in the received IP datagram. The FTP server asks the resolver (DNS client) to send an inverse query to a DNS server to ask for the name of the FTP client. Show the query and response messages with values for each field. Discuss separately.   5

**[B.]** Describe how Web caching can reduce the delay in receiving a requested object. Will Web caching reduce the delay for all objects requested by a user or for only some of the objects? Why?   4

**[C.]** What are the services provided by the SSH protocol through port forwarding? Explain with example.   3

**[D.]** Show the encoding for the INTEGER 1456 in case of SNMP.   2

**[A.]** Suppose a content provider, NetCinema, employs the third-party CDN company, KingCDN, to distribute its videos to its customers. On the NetCinema Web pages, each of its videos is assigned a URL that includes the string "video" and a unique identifier for the video itself; for example, Transformers 7 might be assigned http://video.netcinema.com/6Y7B23V. If DASH is used, what will be the steps before the client can dynamically select chunks from the different versions of the video?   5

**[B.]** Consider a new peer Alice that joins BitTorrent without possessing any chunks. Without any chunks, she cannot become a top-four uploader for any of the other peers, since she has nothing to upload. How then will Alice get her first chunk?   4

**[C.]** Define Jitter. Explain the application of TFTP in conjunction with DHCP.   3

**[D.]** Do you think H.323 is actually the same as SIP? Make a comparison between the two.   2

[Figure in the right margin indicates full marks. Split answering of any question is not recommended.]
Answer any 5 of the following questions.

1. a) The following is a dump of a TCP header in hexadecimal format.    7
   05320017 07000001 00000000 50O207FF 00000000
   a. What is the source port number?
   b. What is the destination port number?
   c. What the sequence number?
   d. What is the acknowledgment number?
   e. What is the length of the header?
   f. What is the type of the segment?
   g. What is the window size?

   b) An ISP is granted a block of addresses starting with 120.60.4.0/22. The ISP wants to    5
   distribute these blocks to 100 organizations with each organization receiving just eight
   addresses. Design the subblocks and give the slash notation for each subblock. Find out how
   many addresses are still available after these allocations.

   c) Why do we need a DNS system when we can directly use an IP address?    2

2. a) What is NAT? How can NAT help in address depletion?    3

   b) Briefly define subnetting and supernetting. How do the subnet mask and supernet mask differ    5
   from a default mask in classful addressing?

   c) A block of addresses is granted to a small organization. We know that one of the addresses is    6
   205.16.37.39/28. Find out the first address, last address, and the number of addresses in the
   block. Also show the network configuration for the block.

3. a) What is CIDR? Find the netid and the hostid of the following IP addresses:    5
   i. 217.34.3.20
   ii. 211.23.16
   iii. 114.56.7.83
   iv. 207.24.12

   b) In TCP, if the value of HLEN is 1000, how many bytes of option are included in the    2
   segment?

   c) A TCP connection is using a window size of 12,000 bytes, and the previous    5
   acknowledgment number was 22,001. It receives a segment with acknowledgment number
   24,001 and window size advertisement of 12,000. Draw a diagram to show the situation of
   the window before and after.

   d) In the standard Ethernet, if the maximum propagation time is 25.6 µs, what is the minimum    2
   size of the frame?

4. a) Illustrate the Ethernet Frame. Also show the minimum and maximum length.    4

   b) Write short notes on:    6
   i. Wireless LAN
   ii. Point-to-point WAN
   iii. Switched WAN

   c) How are options negotiated in TELNET?    4

5. a) Show a request that retrieves the document. Assume users defined. Use at least two general    5
   headers, two request headers, and one entity header. Also show the response for a successful
   request.

   b) Write down the differences among repeaters, bridges, and routers.    4

   c) What is the purpose of the reverse domain?    3

   d) Define three types of web documents.    3

6. a) When both sender and receiver are connected to the same type of LAN or a WAN, what    2
   types of signals are needed and how signals change in a switch.

   b) Difference between a bridge a hub.

Give the answers of any 5 questions from the given questions.

1. (a). Discuss about the protocols in computer networking.      6
   (b). Discuss about bus, ring, star and mesh topology with cable link connection of the given      8
   topology.

2. (a). What are the major duties of data link layer? How data link layer completes node-to-node      8
   delivery?
   (b). Write down the short note on connection control, flow control and error control in transport      6
   layer.

3. (a). Distinguish a unicast address from multicast address.      4
   (b). Discuss the functions of 802.3 MAC frame.      6
   (c). Why bridged and switched Ethernet are used in networking systems?      4

4. (a). Show the encoding of 1000 base-X and 1000 base-T Ethernet.      6
   (b). What are the features of RS and MII of fast Ethernet?      4
   (c). Why repeater is used in networking system? Compare the performance of repeater and hub.      4

5. (a). What are the loop problems for bridge connections? Show the example of loop problems      6
   (b). Show the steps of spanning tree in a bridged LAN      6
   (c). How does a VLAN reduce network traffic?      2

6. (a). Discuss about store and forward packet switching in network layer.      4
   (b). How each node is labeled in shortest path routing algorithm?      3
   (c). Why subnet masks are used in computer networking?      3
   (d). In a computer network, Network address is given as 196.64 .10.0      4
   Subnet Mask is given as 255.255.255.248

   Find the answer of following questions

   i. What are the valid subnets?

   ii. What are the valid first hosts?

[C.] Write down the answer only. Wrong answer has negative marks (0.25 per answer)
      MP is a _____ layer protocol.

[Figures in the right margin indicate full marks. Split answering of any question is not recommended]

### Answer any 5 of the following questions:

1. (a). Which topology in computer networks is better according to your perception? Show your justifications.  4

   (b). Write down the responsibilities of data link layer and transport layer in internet model.  10

2. (a) Discuss about the MAC frame in Traditional Ethernet.  7

   (b). Write down the short note on RS, GMII, PHY, and MDI in Gigabit Ethernet.  7

3. (a). What is ARP? Discuss about the fields in ARP packet.  8

   (b). Find out the checksum in the given IP packet  6

| 4 | 5 | 0 | 28 | |
|---|---|---|---|---|
| | 1 | | 0 | 0 |
| 4 | | 17 | 1 | |
| | | 10.12.14.5 | | |
| | | 12.6.7.9 | | |

4. (a). Implement the connection-oriented service in the network layer.  6

   (b). What is datagram subnet? Implement the datagram subnet.  8

5. (a). Show how distance vector routing works in a subnet.  6

   (b). What is routing algorithm? Discuss about the shortest path routing algorithm.  8

6. (a). Show the timing of events in circuit switching and packet switching.  4

   (b). In a computer network,  10

   Network address is given as 192.168.10.0

   Subnet Mask is given as 255.255.255.248

   Find the answer of following questions

   i. How many subnets?

   ii. How many hosts?

   iii. What are the valid subnets?

   iv. What are the valid hosts?

   v. What are the broadcast addresses for each subnet?

Dept. of Computer and Communication Engineering
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Final Examination of B. Sc. Engineering in CSE Level: III Semester: I Session: 2017-2018

| Course Code | Course Title | | |
|---|---|---|---|
| CCE 314 | Computer Networks Sessional | January-June 2020 | Credit: 03 |

Time: Hr
Marks: 70

1 (a)
i. Build, test, and configure the entire lab network
ii. Integrate skills from throughout the course
iii. Analyze the events involved in requesting a web page (DNS, ARP, HTTP, TCP, IP,
   a. Ethernet, HDLC)
iv. Analyze the events involved in tracing the route to the web server (DNS, UDP, ARP,
   a. ICMP, IP, Ethernet, HDLC)

15
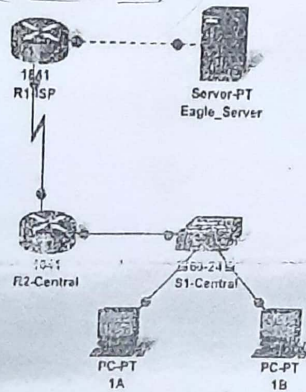


| | | |
|---|---|---|
| 2. | Viva Voce | 15 |
| 3. | Project work on computer network | 10 |
| 4. | Coursera certificate achieve | 05 |
| 5. | Continuous lab assignment submission | 10 |

## Dept. of Computer and Communication Engineering
## Faculty of Computer Science and Engineering
### Patuakhali Science and Technology University
#### Dumki, Patuakhali-8602, Bangladesh
**Final Examination of B. Sc. Engineering in CSE Level: 3 Semester: I Session: 2017-2018**

| Course Code | Course Title | January-June 2020 | Credit: 03 |
|---|---|---|---|
| CCE 313 | Computer Networks | | Time: 03 Hr |

Answer any 05 out of 06 Questions (Split answers are highly discouraged)  Marks: 70

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**1 [A.]** Explain the objectives and learning outcomes of this computer network course as a student of CSE. **2**

**[B.]** What are the requirements to get a job in the computer networking field? Mention five ISP providers in Bangladesh. **4**

**[C.]** Suppose PC A wants to communicate to PC B through below networking devices. Now state the below network configuration through TCP/IP layer model in each device. **4**
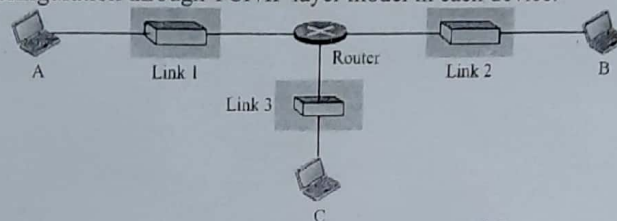


**[D.]** Write the duties/services and protocol of each specific OSI layer. **4**

**2 [A.]** Why do you think both the sender and receiver addresses are needed in the Internet? **2**

**[B.]** "Four levels of addresses are used in an internet employing the TCP/IP protocols and each address is related to a one layer in the TCP/IP architecture". Justify the statement. **4**

**[C.]** Distinguish among broadcast, multicast and unicast address. **4**
Define the type of the following destination addresses with explanation.
a. 4A:30:10:21:10:1A
b. 47:20:1B:2E:08:EE
c. FF:FF:FF:FF:FF:FF

**[D.]** Draw and explain a connection oriented packet switched network. **4**

**3 [A.]** Find the class of each address: **2**
a. 00000001 00001011 00001011 11101111
b. 11000001 10000011 00011011 11111111
c. 10100111 11011011 10001011 01101111
d. 11110011 10011011 11111011 00001111

**[B.]** How can you extract three pieces information in a Block? Explain the procedure with a block diagram. **3**

**[C.]** An address in a block is given as 180.8.17.9. Find the number of addresses in the block, the first address, and the last address and presents it with a diagram. **3**

**[D.]** An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to 2600 customers as follows: **6**
a. The first group has 200 medium-size businesses; each needs approximately 128 addresses.
b. The second group has 400 small businesses; each needs approximately 16 addresses.
c. The third group has 2000 households; each needs 4 addresses.
Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations.

**4 [A.]** Three necessary steps need to be carefully followed to guarantee the proper operation of the subnetworks. Justify the statement. **2**

**[B.]** For the proper operation of the CIDR, three restrictions need to be applied to the allocated block. Write down the three notation. **3**

**[C.]** Write down the answer only. Wrong answer has negative marks (0.25 per answer). **0.5 *6 =3**
  (i)    ICMP is a _____ layer protocol.
  (ii)   An ARP request is normally _____.
  (iii)  IP is _____ datagram protocol.
  (iv)   Packets in the IP layer are called _____.
  (v)    In _____ forwarding, the mask and destination addresses are both 0.0.0.0 in the routing table.
  (vi)   In classful addressing, the class of the address can be found by shifting the copy of the address _____ bits to the right.

P

**[D.]** Suppose there are three faculties in PSTU like: Agriculture, CSE, and NFS. The Agriculture is connected to the CSE and BAM faculty via private, point-to-point WAN lines. The university is granted a block of 512 addresses with the beginning address 169.12.100.128/23. The management has decided to allocate 132 addresses for the Agriculture faculty and divides the rest of addresses between the two other faculties. Write down the networking planning with IP and with block diagram    **6**

**5**

**[A.]** Which addresses are used either in isolation or in connection with network address translation techniques?    **2**
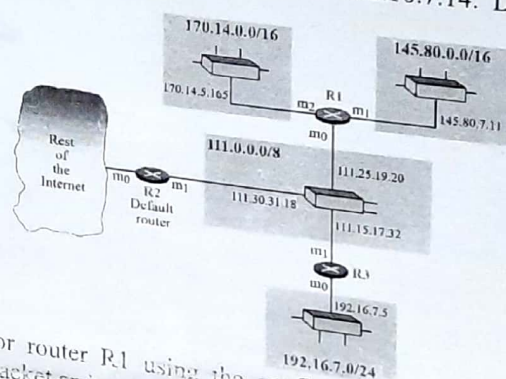
**[B.]** Define subnet. Discuss the simplified forwarding module in classful address without subnetting    **4**

**[C.]** Below figure shows an imaginary part of the Internet. Show the routing tables for router R1. If router R1 receives a packet with destination address 192.16.7.14. Discuss how the packet is forwarded.    **4**



**[D.]** Make a routing table for router R1 using the configuration in Figure below. Then show the forwarding process if a packet arrives at R1 in Figure with the destination address 180.70.65.140.    **4**
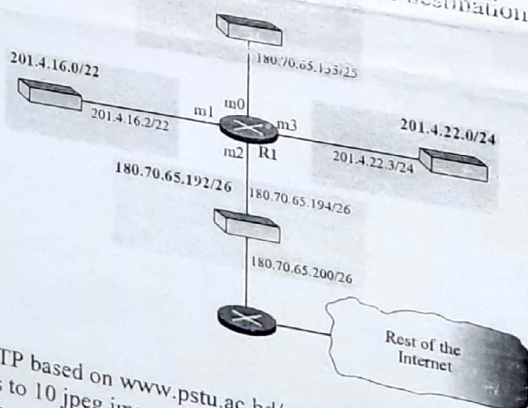


**6**

**[A.]** Explain non-persistent HTTP based on www.pstu.ac.bd/someDepartment/home.index (containing text, references to 10 jpeg images)    **4**

**[B.]** Describe how Web caching can reduce the delay in receiving a requested object. Will Web caching reduce the delay for all objects requested by a user or for only some of the objects? Why?    **3**

**[C.]** Consider an e-commerce site that wants to keep a purchase record for each of its customers. Describe how this can be done with cookies.    **3**

**[D.]** Consider the following network. With the indicated link costs, use Dijkstra's shortest-path algorithm to compute the shortest path from u to all network nodes. Show how the algorithm works by computing a table.    **4**