

( 2 )

(b) Describe IMAP. What are the advantages of IMAP over POP3 ?

3. (a) Explain fairness problem in TCP connections. Can it be completely solved ?

(b) Explain :

(i) End-to-end congestion control

(ii) Network assisted congestion control

4. (a) How is a virtual circuit service implemented in a computer network ?

(b) Describe Link-State Routing Algorithm.

5. (a) What are the techniques for detecting errors in transmitted data ? Explain any two of them.

(b) Explain with example the purpose of using an Address Resolution Protocol.

6. (a) Explain :

(i) Ciphertext-only attack

(ii) Known-plaintext attack

(iii) Chosen-plaintext attack

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( Continued )

( 3 )

(b) How can message integrity be performed ?

7. (a) Describe polling and token-passing protocols.

(b) What are the advantages of Open Shortest Path First routing algorithm ?

8. (a) How do the TCP senders determine their sending rates such that they don't congest the network but at the same time make use of all the available bandwidth ?

(b) Explain the working of three classes of DNS servers in recursive and iterative queries.

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Total Pages —4

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7. State the major difference between Vector Routing and link state routing. 14

8. Write short notes on : 7 × 2

(i) Datagram network

(ii) Virtual circuit network(4).

B.Tech 6th Semester Examination 2016

COMP.NET.

Full Marks : 70

Time : 3 hours

Answer any five questions

*The figures in the right-hand margin indicate marks*

*Candidates are required to give their answers in their own words as far as practicable*

1. Explain the OSI-ISO model I of computer with neat diagram. 14

2. (a) Both the TCP and UDP protocols use port numbers. What are these port numbers used for and what is meant by the term well known port ? 7

(b) For each of the following applications

( 2 )

determine whether you would use TCP or UDP and explain the reasons for your choice : 7

(i) File transfer

(ii) Watching a real time streamed video

(iii) Web browsing

(iv) A Voice over IP (VoIP) telephone conversation.

3. (a) A host was given the IP addresses 192.168.3.219/27. Consider this address and indicate : • The network address to which the host belongs. • The network broadcast address to which the host belongs. • The total number of hosts available in the network. 7

(b) Considering IPv4 classless addressing, an organization is granted a block of addresses with the beginning address 14.24.74.0/24. The organization needs to have 3 subblocks of addresses to use in its three subnets as shown below : • One subblock of 120

( 3 )

addresses. • One subblock of 60 addresses. • One subblock of 10 addresses. Indicate the network IP address and the subnet mask for each of the subblocks. 7

4. (a) The data link layer in the IEEE standard is divided into two sublayers : LLC and MAC. Indicate the functions performed by each sublayer. 7

(b) Draw the flow diagram of the Carrier Sense Multiple Access/Collision Avoidance mechanism used by 802.11 (CSMA/CA). 7

5. (a) Explain Protocols for noiseless and Noisy channels. 7

(b) Explain numbering of frames in GO Back NARQ, Selective Repeat ARQ Protocols. 7

6. (a) Compare connection oriented and connection less service. 7

(b) Differentiate Guided media and unguided media. 7

## UL (6)–Computer Networks

2017 (A)

Full Marks : 70

Time : 3 hours

Answer any five questions.

*The figures in the right-hand margin indicate marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

1. What do you mean by a communication network ?  
Explain TCP/IP Network model. 14
2. (a) Define channel capacity. Discuss the key factors that affect channel capacity. 7  
(b) Given a channel with an intended capacity of 20 Mbps, the bandwidth of the channel is 3 MHz. Assuming white thermal noise, what signal-to-noise ratio is required to achieve this capacity. 7
3. (a) Describe the Link State routing protocol. 7

( Turn Over )

(b) Compare and contrast Pulse Code Modulation and Delta Modulation. 7

4. (a) Define flow control. What are the advantages of Sliding-window flow control compared to Stop-And-Wait flow control? 7

(b) We need to use synchronous TDM and combine 25 digital sources, each of 100 Kbps. Each output slot carries 1 bit from each digital source but one extra bit is added to each frame for synchronization. Find : 7

(i) The size of an output frame in bits,

(ii) Duration of an output frame, and

(iii) The output data rate.

5. (a) What is a switched network? Discuss the advantages of packet switching over circuit switching. 7

(b) State the difference between IPv4 and IPv6. 7

6. (a) Explain the sliding window protocol. 7

(b) Describe the various methods for quality of services (QoS). 7

7. (a) Explain the symmetric key and asymmetric key cryptography with suitable diagrams. 7

(b) Explain any user authentication protocol. 7

8. (a) Describe the different types of guided media with suitable diagrams. 7

(b) Explain CRC protocol for error detection. 7

**B.Tech. 6th Semester Examination, 2018**

**COMP.NET.**

**Full Marks : 70**

**Time : 3 hours**

**Answer any five questions**

*The figures in the right-hand margin indicate marks*

*Candidates are required to give their answers in their own words as far as practicable*

- (a) Describe about different components that are used in data communication system. 5
- (b) What are some of the factors that determine whether a communication system is a LAN or WAN? 4
- (c) When we say that the transport layer multiplexes and demultiplexes application layer messages, do we mean that a transport-layer protocol can combine several messages from the application layer in one packet? Explain with diagram. 5

( Turn Over )

2. (a) Find the bandwidth requirement to transmit a data at 256 Kbps when each sample requires 8 bits.

5

(b) A signal is travelling through a channel that has a loss of 0.25 dB/km. Find the distance, where its power is reduced to one-half of the beginning power.

5

(c) What is the main difference between TDM and TDMA.

4

3. (a) What are the two approaches to packet switching and describe them separately?

8

(b) A path in a digital circuit-switched network has a data rate of 1 Mbps. The exchange of 1 Kb is required for each set-up and tear-down phases. The distance between two parties is 1500 km and the propagation speed is  $1.5 \times 10^8$ . Find the total delay if 10 Mb of data are exchanged during the data-transfer phase?

6

4. (a) Which protocol is used to determine the destination link-layer address and describe

the packet format of that protocol (with block diagram).

10

(b) What is the size of link-layer address? Justify your answer?

4

5. (a) How does a single-bit error differ from a burst error?

3

(b) What is Checksum?

3

(c) What is the frame format of PPP (only block diagram)?

3

(d) A pure ALOHA network transmits 200-bit frames on a shared channel of 200 Kbps. What is the throughput if the system (all stations together) produces 1000 frames per second?

5

6. (a) Show how the address (Ethernet) 47 : 20 : 1B : 2E : 08 : EE is sent out online.

4

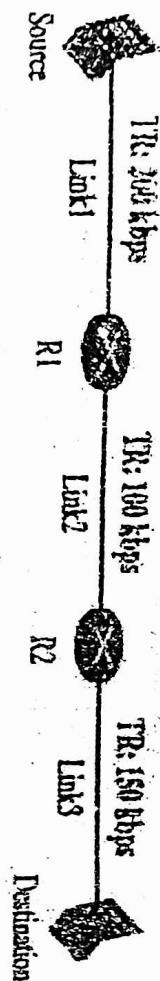
(b) Draw the block diagram of bluetooth layers.

3



(c) Find the throughput of the figure.

2



(d) Draw the block diagram of IP datagram.

5

7. (a) The following is the content of a UDP header in hexadecimal format :

0045DF0000580000.

Find (i) Source port number (ii) destination port number, (iii) total length of the user datagram, and (iv) length of the data.

8

(b) What is the main difference between TCP and SCTP ?

3

(c) Write 3 protocol names (full form) at transport layer.

3

8. (a) Suppose a TCP connection is transferring a file of 4 KB. What are the sequence numbers for each segment if data are sent in five

segments, each carrying equal number of bytes.

6

(b) Explain, how TCP/IP uses a DNS client and a DNS server to map a name to an address (with diagram) ?

8



## UL(6)-Comp. Network

2019(A)

Full Marks : 70

Time : 3 hours

Answer any five questions.

*The figures in the right-hand margin indicate marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

1. (a) What are the components of a data communication system ? 4  
(b) Explain in detail all the layers in the OSI model with the help of a diagram. 10
2. (a) Describe the architecture of Star Topology. What are its pros and cons ? 7  
(b) Explain the process of multiplexing and demultiplexing in FDM. 7
3. (a) What are the causes of transmission impairment ? Describe them in detail. 6

(Turn Over)

- (b) The capacity of a channel is 30 Mbps. The bandwidth of the channel is 4MHz. Calculate the SNR required to achieve this capacity ? 4
- (c) What are the propagation time and the transmission time for a 5-kbyte message if the bandwidth of the network is 1 Mbps ? Assume that the distance between the sender and the receiver is 10,000 km and that light travels at  $2.4 \times 10^8$  m/s. 4
4. (a) Explain in detail the PPP frame format. 7
- (b) How does Stop-and-Wait ARQ handle the scenario in which a frame is lost ? 7
5. (a) What do you mean by Classful Addressing ? Describe in brief. 5
- (b) With the help of an example show the working of ARP protocol. 5
- (c) You have been allocated a Class B network address of 129.1.0.0. You have subnetted it using the subnet mask 255.255.255.0. How many networks can you have and how many hosts can you place on each network ? 4

UL(6)-Comp. Network

( Continued )

6. (a) Describe the steps in the connection establishment phase of TCP ? 7
- (b) Why is Congestion Control necessary ? Give an example to support your answer. 7
- (c) Write in brief about the four different characteristics of Flow ? 4
7. (a) What is DNS and how does it work ? Explain in detail with an example. 7
- (b) How does an email go from the sender to the receiver ? Describe all the steps. 7
8. (a) What are the basic components of a Cryptographic System ? 5
- (b) What is a Key Distribution Centre ? How does it function ? 5
- (c) How does a Digital Signature authenticate the Sender ? 4

UL(6)-Comp. Network

HZ-1200