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First Internal Test

Sub:	Computer Networks					Code:	15CS52		
Date:	18 / 09 / 2017	Duration:	90 mins	Max Marks:	50	Sem:	V	Branch:	ISE

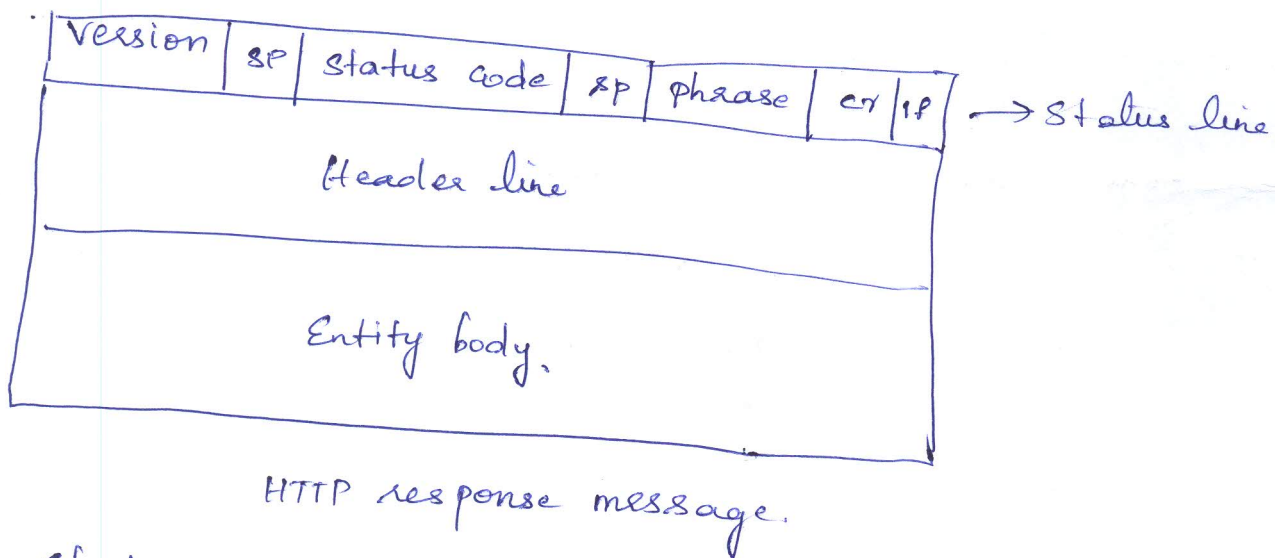
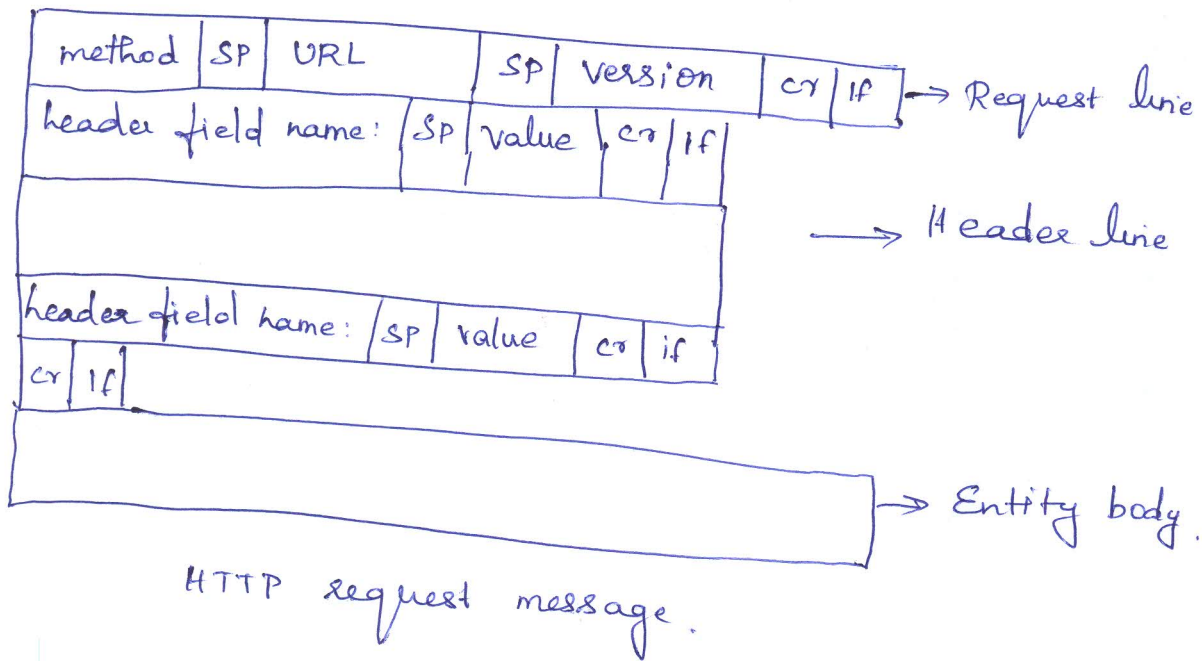
Answer Any **FIVE FULL** Questions

	Marks	OBE	
		CO	RBT
1 (a) Quote HTTP message format.	[05]	CO1	L1
(b) Discuss how an electronic mail is transferred over internet.	[05]	CO1	L2
2 (a) Consider your college is providing 15Mbps internet connectivity for public network and 100 Mbps speed within local area network, whether you are able to browse the web using this low speed, if yes justify.	[05]	CO1	L5
(b) Label DNS message.	[05]	CO1	L1
3 (a) I have used POP3 protocol to download my mail into my laptop but after downloading I am unable to view the mail in my mobile, what protocol I may have used instead of POP3, justify.	[05]	CO1	L5
(b) Describe circular DHT.	[05]	CO1	L2

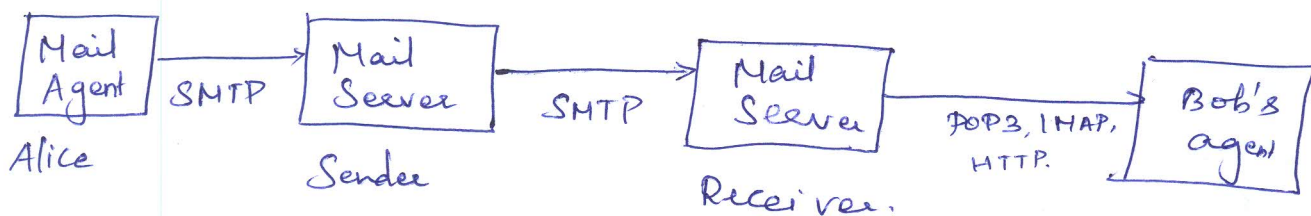
- 4 (a) Summarize the working of DNS. [05]
- (b) Every server is identified by its IP address, but I am unaware of the IP address of CMRIT website, explain how can I visit CMRIT website. [05]
- 5 (a) Describe Rdt 3.0 protocol. [05]
- (b) Illustrate a socket program for server sending a file name and the client reads the content of the file and the same is displayed in server side. [05]
- 6.(a) Bob is sending a 16-bit 3 words to Alice using UDP, Alice has to test whether bit error is present in the received data or not. Sender side data:
Data Sent: 1000101010111100
 0101011110001110
 1111000011100011. Help Alice in error detection process. [05]
- (b) Compare and contrast Go-Back-N and Selective Repeat protocol. [05]
- 7 (a) Explain how connection is established between two hosts using TCP protocol. [05]
- (b) Because of some activity there is some shortage of class room, so 5a and 5b classes have to be combined in a single classroom, whether the class room will be congested with respect to network, if yes examine how it can be handled? [05]

[05]	CO1	L1
[05]	CO1	L4
[05]	CO2, CO3	L2
[05]	CO2, CO3	L3
[05]	CO2, CO3	L5
[05]	CO2, CO3	L4
[05]	CO2	L3
[05]	CO2, CO3	L3

1. a) HTTP message format.



b). Electronic mail is transferred using Simple Mail Transfer Protocol (SMTP).



User compose mail & send it to mail server, the sender's mail server establishes TCP connection with recipient's mail server & transfers the mail.

2)a). Yes, we can access the internet even using 15 Mbps internet connectivity. This can be achieved by ^{using} proxy/cache server in the local area network. Whenever a request goes from the client, it first sees the proxy server, if p. if the page is present in the proxy then gives the response, if it is not there then it gets the page from the origin server, stores it in its local database & gives response to the client.

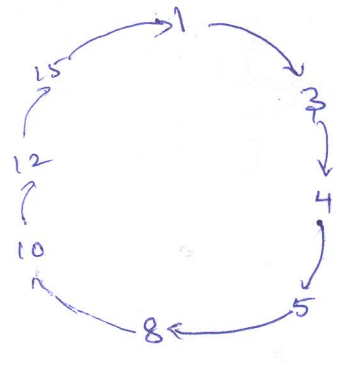
b). DNS message.

Identification	Flags
No' of questions	No' of answer RRs
No' of authority RRs	No' of additional RRs.
Questions.	
Answers	
Authority	
Additional information	

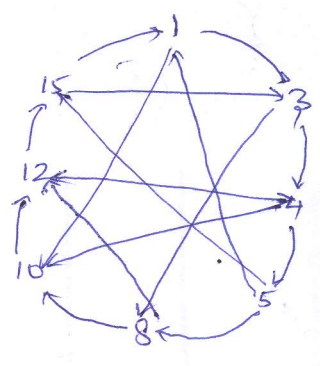
3a). IMAP (Internet Mail Access Protocol) might have been used instead of POP3. In POP3 protocol the mail is used in only one system & the mail will be deleted from the server. But in case of IMAP, only the header is download, so the mail can be downloaded / viewed in any device with internet connectivity.

b) Circular DHT (Distributed Hash Table).

Is a distributed database with key-value pairs arranged in circular arrangement



Circular DHT

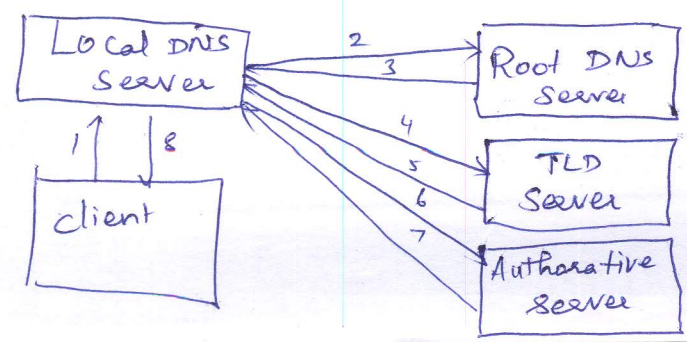


Circular DHT with shortcuts

Each peer knows about its immediate successor & predecessor. If there is a query, then a node can search only its successor & predecessor. But it is time consuming, in order to overcome this circular DHT with shortcuts is used, where each peer is connected to more peers.

4.a) Working of DNS. (Domain Name System).

DNS is used to convert domain name into IP address. The browser request local DNS server for IP add' for specific domain. If it is there in local DNS server, it gives the response, else it requests Root DNS server, then Top level Domain (TLD) server & then authoritative server & finally gets the IP add' store it in its local database & gives it to the client.



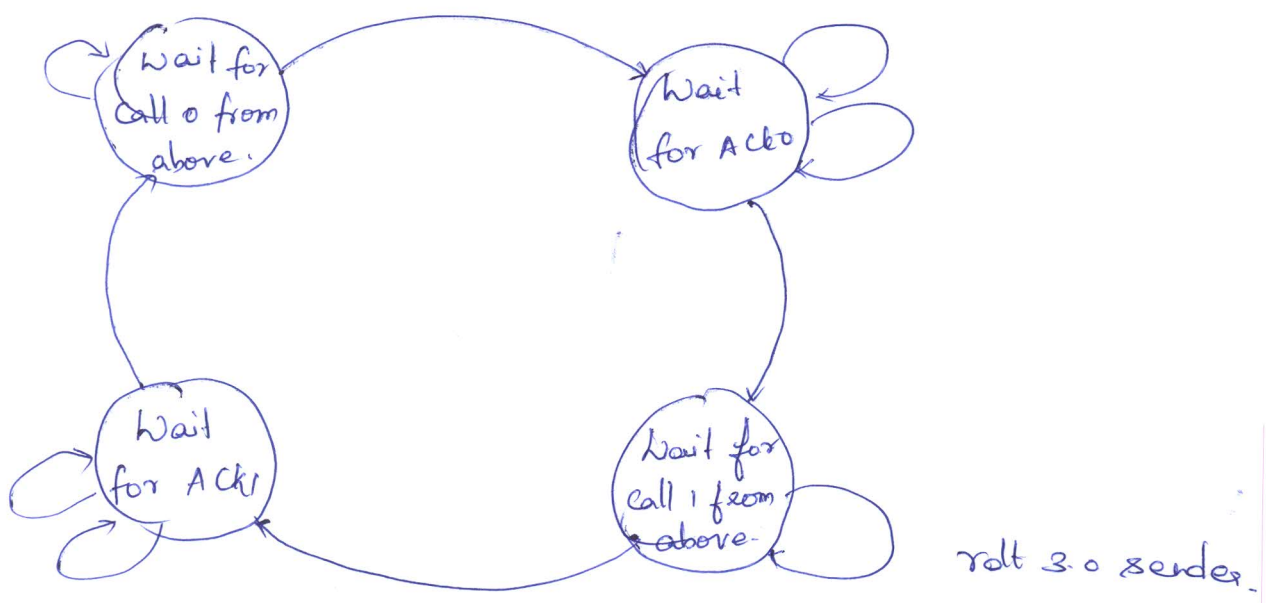
DNS Working

b) Every server can be identified by its own IP address, but users are not aware of the IP add', for eg, now one is aware of CMRIT server's IP add', so the user will type the domain name of CMRIT in the URL, in order to connect to the server, the domain name should be changed into IP address. This can be achieved by Domain Name System (DNS).

Where, the browser requests the DNS & gets the IP add', such that request the CMRIT server & gets the response.

5. a) Rdt 3.0 protocol.

It is a reliable data transfer protocol, also called as alternating-bit protocol.



Process:

1. Start the timer each time a packet is sent.
2. Respond to a timer interrupt.
3. Stop the timer.

For reliable data transfer, this protocol uses.

- i) Sequence no'
- ii) Acknowledgment no'
- iii) Timer.

b). Socket Program:

Client Side:

```

import java.io.*;
import java.net.*;

public class TCPclient
{
    public static void main(String args[]) {
        Socket s = new Socket ("localhost", 6666);

        DataInputStream din = new DataInputStream (s.getInputStream());
        String fname = din.readUTF();
        BufferedReader bin = new BufferedReader (new FileReader
                                                    (fname));

        DataOutputStream dout = new DataOutputStream (s.getOutputStream());
        String fcontent = bin.readLine();
        dout.writeUTF(fcontent); s.close(); } }

```

Server side:

```

public class serverTCP {
    public static void main (String args[]) {
        ServerSocket ss = new ServerSocket (6666);
        Socket s = ss.accept();

        DataOutputStream dout = new DataOutputStream (s.getOutputStream());
        BufferedReader bin = new BufferedReader (new InputStreamReader (
                                                    new System.in));
        DataInputStreamReader din = new DataInputStream (s.getInputStream());
        System.out.println ("Enter the file name"); String fname = bin.readLine();
        dout.writeUTF (fname);
        String fcontent = din.readUTF(); System.out.println (fcontent);
        s.close();
    }
}

```

b) a)
$$\begin{array}{r} 11111111111111 \\ 1000101010111100 \\ 0101011110001110 \\ 1111000011100011 \end{array}$$

Bob's side.

①
$$\begin{array}{r} 1101001000101101 \\ \hline \end{array}$$

$$\begin{array}{r} 1101001000101110 \\ \hline \end{array}$$
 is complement

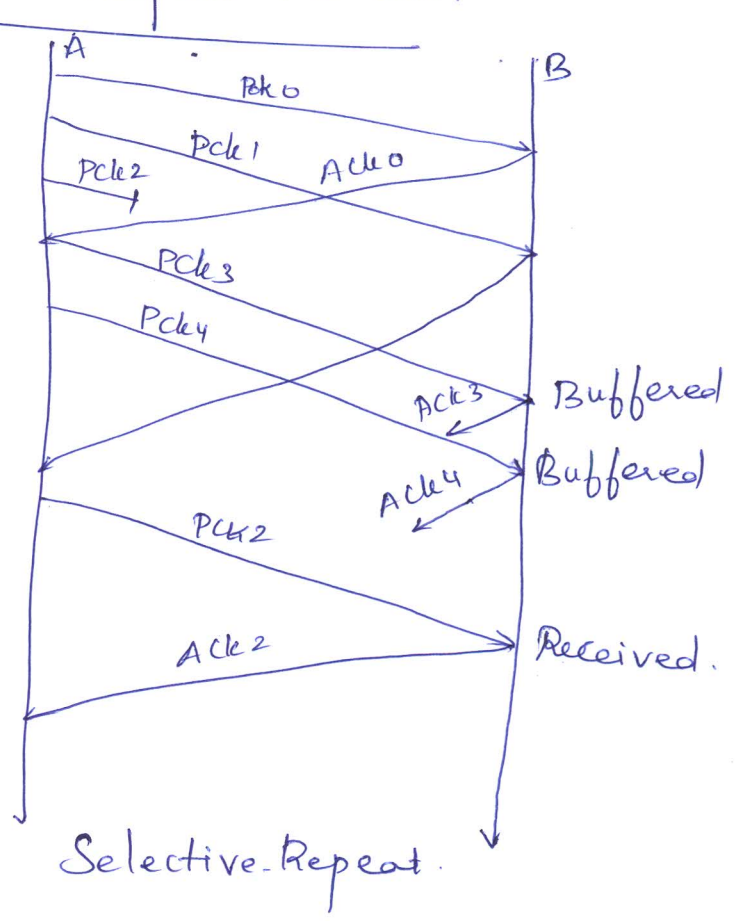
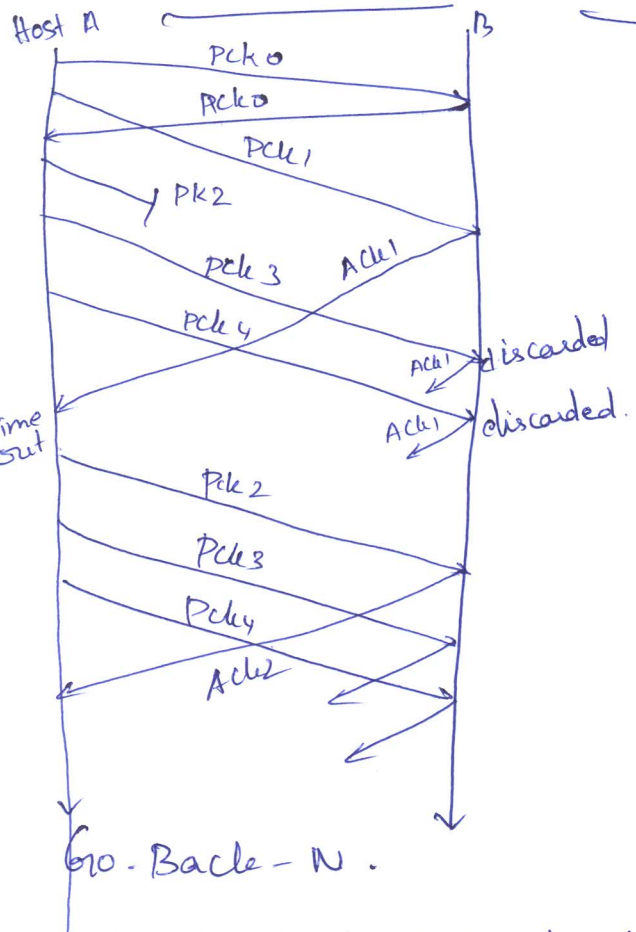
$$\begin{array}{r} 0010110111010001 \\ \hline \end{array}$$
 → checksum.

Alice receiver's data + checksum.

$$\begin{array}{r} 1101001000101110 \\ 0010110111010001 \end{array}$$

$$\begin{array}{r} 1111111111111111 \\ \hline \end{array}$$
 → All 1's, ^{so} no error.

b). Go-Back-N & Selective Repeat Protocol.

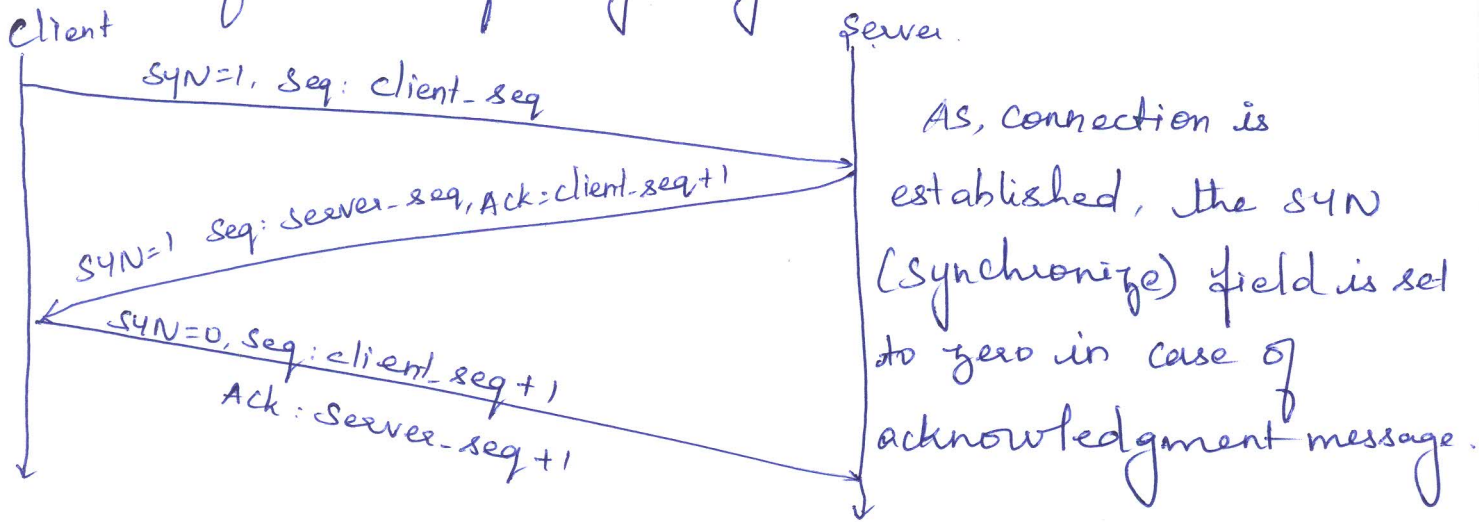


In Go-Back-N protocol, the packets that have arrived in out-of-order will be discarded, hence all the packets have to be re-transmitted, whereas in case of selective-repeat protocol, the out-of-order packets are buffered, thus unnecessary retransmissions have been reduced.

7) a) Connection Establishment.

(7)

As TCP is a connection-oriented protocol, connection should be established, before transferring any data.



b). If the classes 5a & 5b, want to be accommodated in a single classroom, then the class room will be congested. In order to overcome this, TCP congestion control mechanism can be followed.

At first, the students are asked to stand outside the door, at first then 5 students are asked to enter the classroom (slow start), if there is no congestion, then 10 students, then 20 students, 40 students are allowed upto (80 students \approx threshold). Then students are allowed one by one linearly until congestion occurs.

If congestion occurs then the students count before congestion is taken as threshold value & again slow start starts until congestion. The remaining students can be accommodated in some laboratory if needed.