Module 1

1) Service Primitives
2) Uses of Computers. — study all introduction topics.
   Topology, Modes of transmission
3) Connection oriented & connectionless.
4) Signal encoding - Manchester and Differential.
5) Guided & Unguided Media.
6) TCP ref model, OSI ref model
7) Comparison
8) Performance Indicators

(problems will put ~~code~~ notes)

Module 2

1) Data link layer design issues
2) Hamming code, CRC, checksum, Parity (problems).
3) Multiple Access protocols
   - CSMA, Aloha, slotted Aloha
   - CSMA cd/CA
4) Data link Protocols → HDLC →
5) IEEE 802.11, 802.3 → ethernet frame for
6) Repeaters, hubs, Bridges, switches, Routers, G
   [Just study what do you mean by each
7) ~~Text~~
8) sliding window Protocols
   - Stop & wait
   - Selective ARQ
   - Go back ARQ

Module 3

- Routing in Mobile hosts
  - figure explaining foreign Agent, home Agent.
- Distance Vector Routing → steps to find
  - Problem,
  - Disadvantages
- Flooding → purpose, disadvantages.
- Network layer design issues.
- Congestion Control methods Virtual Circuits
  - open loop → 5 methods
  - closed loop = 4 methods
- Congestion Control in datagram Circuits = 3 methods
- Difference blw virtual and datagram.
- QoS = Quality Service. - methods
  - Token Bucket; study problem also.
  - Leaky Bucket

Important

Module 4

IPV4 protocol → header format - 32 bit.

IP Address → classfull Addressing
- ↳ class A
- ↳ Class B
- ↳ Class C
- ↳ class D
- ↳ class E

— subnets

Problems → Subnet Masks, subnet.
(problems njan Xeu idam)

IPV6, ICMP (2 types of msgs
- ↳ query Messge E
- ↳ Error Reporting E

ARP and RARP

RARP → disadvantages.

Becos of that DHCP and BOOTP developed.

→ classless Addressing → Advantages.
→ NAT, private Addresses.

→ Notes →
dulerv

Module 5 (Refer the Module IV note in drive CN)

TCP → header (important)

→ handshaking protocol

↳ Connection Establishment } SYN, FIN (diagram)

↳ Release } (diagram)

UDP → header.

DNS = Domain Name System (full padikkanam)

↳ Resolution

↳ Domain Name space.

↳ DNS header.

↳ Resource Record

Electronic Mail = SMTP

→ SNMP

→ WWW = Working.

Subnet Mask = put 1s in the n/w id positions and 1s in the subnet id positions

A n/w in the internet has a subnet mask of 255.255.240.0. what is max n:of hosts it can handle.

Subnet mask = 255.255.240.0

write the mask in binary form.

255. 255. 240 . 0

↓

11111111 . 11111111 . 11110000 . 00000000

2	240	0
2	120	0
2	60	0
2	30	0
2	15	1
2	7	1
2	3	1
	1	

Max no:of hosts = Count the no:of zeros in abave binary format = 12.

So no:of hosts : $2^{12} - 2$

Dont forget write the -2

- A person who live in Boston travels to minneapolis, taking her portable computer with her. To her supprise, the LAN at her destination in minneapolis is a wireless IP LAN, so she does not have to plug in. Is it still necessary to go through the entire business with home agents and foreign agents to make emails and other traffic arrive correctly?

Ans: Write Mo Routing in Mobilehosts

- Connection Oriented and Connectionless communication- difference.

Connection Oriented → stream based.
Connection is established, Information is sent, Connection is released. Reliable

eg: TCP

Connection less Connection → msg based

Each msg is routed independently from source to destination. The order of msg sent can be different from order recieved

In connection less, the data is transferred in one direction from source to destination is still there or not or if it is prepared to accept the msg, Non reliable.

Eg: TCP, UDP.

How do you subnet the class C IP addrss 195.1.1.0 so as to have 10 subnets with a max of 12 hosts in each ~~subg~~ subnets

No: of subnets = $2^4 = 16$

4 subnets

0000/0000

subnets = 16, so 4 bits is used to represent 16 subnets

{ In qn 10 subnets, but always ~~the~~ power of 2 }

Subnet id is represented in host id part

Here in qn it is mentioned that class C

So in class C, 8 bits represents the host id. So from 8 bits, 4 bits used to represent the ~~host~~ subnet id. ~~Rest~~ rest of bits is used to represent host id.

Subnet Mask = To represent subnet mask, put 1s in n/w id and subnet id part and zeros in host id.

In the ~~eg~~ qn → First 24 bits = N/W id part and next 4 bits is subnet id

n/w id | subnet id | host id

11111111.11111111.11111111.1111 0000 — (1)

No: of hosts : $2^4 - 2$

$= 16 - 2 = 14$ possible host.

{ 4 bits is used to represent hosts
so No: of host in each subnet = $2^4 - 2$ }

From ① Subnet mask = 255.255.255.240

{ Representing the binary format in decimal }

→ How do you subnet the class C IP Addres 206.16.2.0 so as to have 30 subnets. what is subnet mask for maximum no: of hosts. How many hosts can each subnet have.

30 subnets → To identify 30 subnets we need atleast 5 bits

So the subnet mask class C

11111111 11111111 11111111 11111 000
subnet id host id

decimal = 255 255 255 248

No: of hosts = $2^3 - 2$

$= 8 - 2 = 6$ hosts

→ Token Bucket

A computer on 10 Mbps n/w is ~~required~~ regulated by token bucket. The token bucket is filled at the rate of 2 Mbps. It is initially filled to capacity 16 megabits. What is max duration for which computer can transmit at full 10 Mbps.

$S = \frac{C}{M-P}$ { C = token capacity

M = max output rate Mbytes/sec

P = Token arrival rate p bytes/sec.

C = 16 Mbits.

M = 10 Mbps

P = 2 mbps.

{ New tokens are arrived at the rate of 2mbps }

$S = \frac{16}{10-2} = \frac{16}{8} = \underline{\underline{2 \text{ sec}}}$

→ A computer on 6 Mbps network is regulated by a token bucket. The token bucket is filled at a rate of 1 mbps. It is initially filled to capacity with 8 megabits. How long can the computer transmit at the full 6 Mbps.

$S = \frac{C}{M-P}$ C = token capacity

M = max o/p rate

$= \frac{8}{6-1} = \frac{8}{5} = 1.3 \text{ sec}$ P = Token arrival rate

Checksum

The following block of 8 bits is to be sent using a checksum of 4 bits 11001010. Find checksum

11001010 → Divide the data into 2 sets each of 4 bits

```
1100
1010
-----
 0010   add carry
    1
-----
 0011   → Complement
```

Carry

↓

1000

Add
1+0 = 1
0+1 = 1
0+0 = 0
1+1 = 10

0 and 1 carry

Bit to be transmitted = 11001010 1000

checking 1100 | 1010 | 1000 [Again divide by 4 bits]

Do the above steps again

```
1100+      0010+      0011+
1010         1          1000
-----      -----      -----
 0010       0011       1111
```

Complement (1111) = 0000.

11 consider data to be transmitted

= 10011001|11100010|00100100|10000100

Checksum 8 is bits. So divide data in groups of bits.

Add

```
  10011001 +      01111011 +
  11100010              1
  --------        --------
1 01111011        01111100
```

```
  01111100 +      10100000 +
  00100100        10000100
  --------        --------
  10100000      1 00100100
```

```
  00100100 +
           1
  --------
  00100101
```

↓ complement

11011010

Transmitted string including checksum

=

10011001 | 11100010 | 00100100 | 10000100 | 11011010

adding first 4 segments we will get = 00100101

adding check sum '11011010 to that

```
  00100101 +
  11011010
  --------
  11111111
```

complement ↓

00000000

(iii) Bit stream = 10011101, Generator polynomial = $x^3+1 = x^3+0x^2+0x+1$

Generator polynomial = 1001

Append = 3 zeros at the end

```
        10001100
      ----------
1001 | 10011101000
       1001
       ----
       00091101
          1001
          ----
          1000
          1001
          ----
          00091100
```

CRC = 100

Reverse → 10011101100

Checking =

```
        10001100
      ----------
1001 | 10011011 00
       1001
       ----
          0 1101
            1001
            ----
            1001
            1001
            ----
               000
```

Remainder = 0

So no error