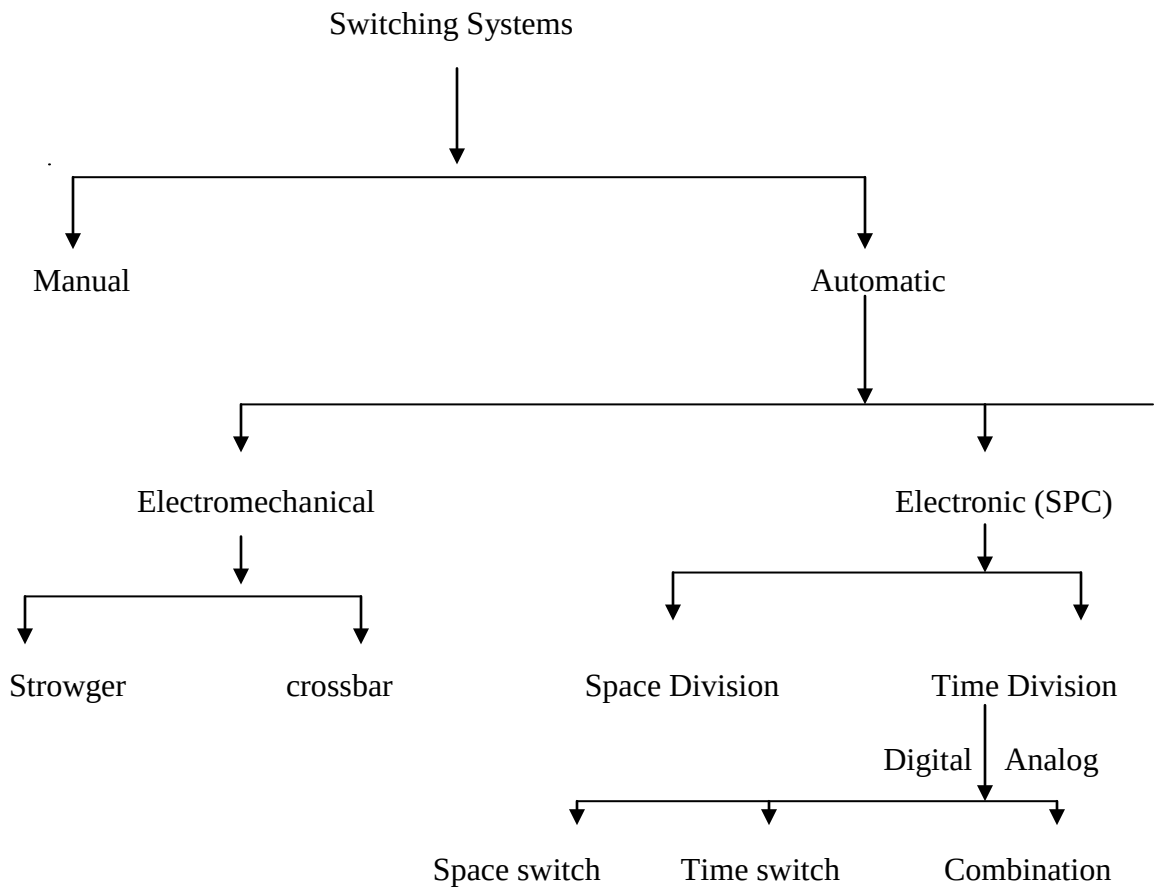
**Q2 (a) Explain briefly various types of switching systems.**

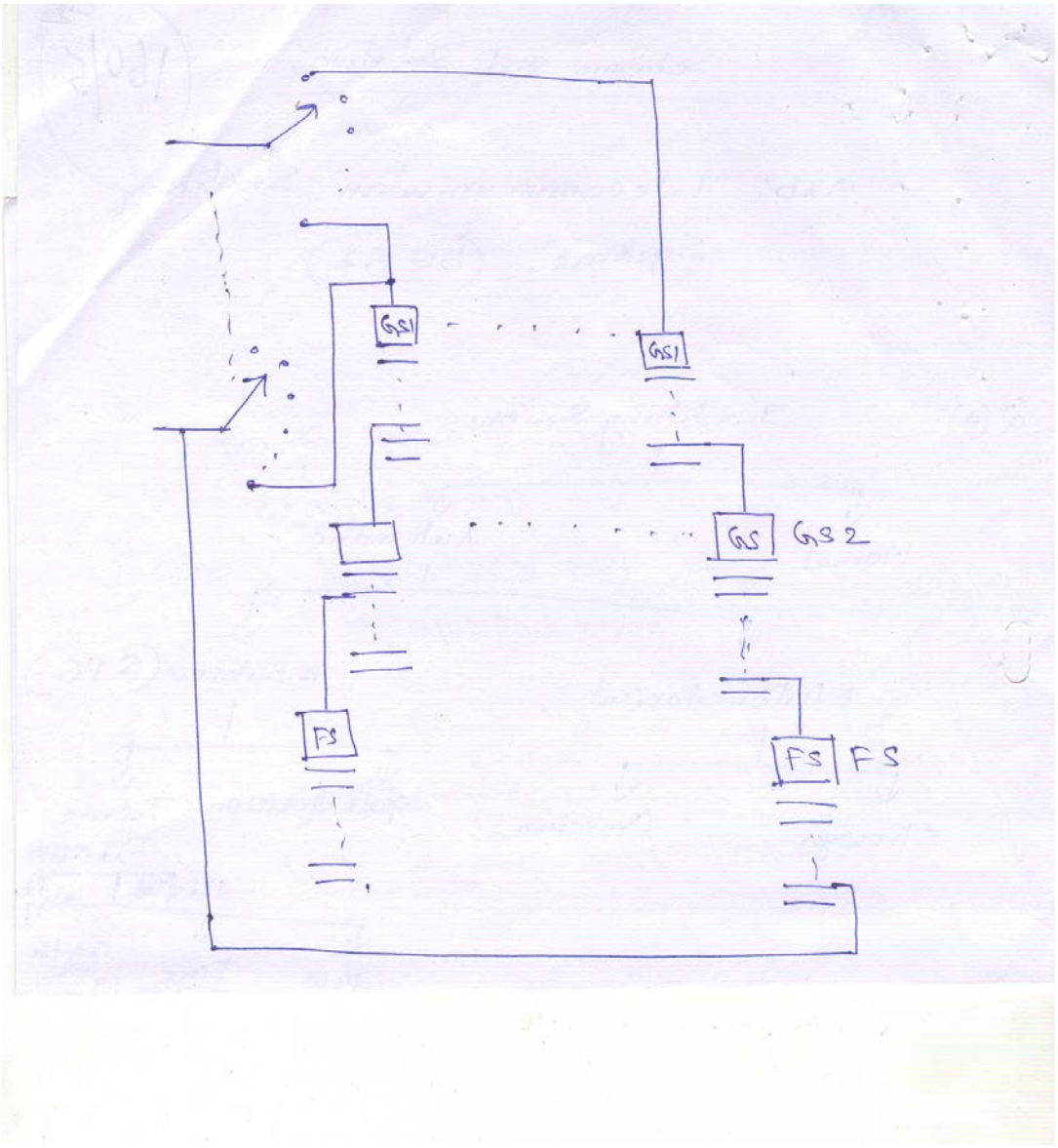
**Answer**




**Q2 (b) Design 10,000 line exchange and show the connection between subscriber 5219 to 8762.**

**Answer**
4 Stages:

1. Pre selector
2. Group selector 1
3. Group selector 2
4. Final selector




**Q2 (c) Explain the operation of reed relay with the help of a neat diagram.**

**Answer** Page Number 79 of Text Book I

**Q3 (a) What is congestion? How GOS is affected by congestion?**

**Answer**

The condition in telephone exchange where all trunks in a group are busy and it can accept no further calls is known as congection.

All attempts to make call over a congested group of trunks are lost are grade of since is defined as

B = Number of calls lost/No of calls offered

Hence proposrtion of the calls lost or delet due to congesion is major of GOS(grey of service.)

**Q3 (b) During busy hour, 900 calls were offered to a group of trunks and 3 calls were lost. If the average call duration is 3 min, find:**
**(i) Traffic Offered (ii) Traffic Carried**
**(iii) Traffic Lost (iv) Grade of Service**

**Answer**

(i) A=Ch/t=300*31/60=45E
(ii) Traffic Carried = (900-3) h /T=897*3/60=44.85E
(iii) Traffic lost =3*3/60=0.15
(iv) B=3/900 =0.00333

**Q3 (c) A group of 20 Trunks provide a GOS of 0.01, when offered 12E Traffic, then how much is the GOS improved if one extra trunk is added to the group.**

**Answer**

1. $E_{1,}$ 21(12) = 12. $E_{1,}$ 20(12)/21+12 $E_{1,}$ 20(12)
   =12*0.01/21+12*0.01=0.0057

2. $E_{1,}$ 21(12) =0.01=12 $E_{1,}$ (12)/20+12 $E_{1,}$ 19(12)
   0.2+0.12 $E_{1,\ 19\ (}$12) =12 E1, 19 (12)
   $E_{1,\ 19}$ (12) =0.017

**Q4 (a) With neat sketch, explain various grading system.**

**Answer**

Grading System: with big explanation

1. Progressive grading
2. Skipped
3. Homogeneous

**Q4 (b) Design a grading for connecting 20 Trunks to switches having 10 outlets.**

**Answer** The number of graded group g=2N/k=2*X20/10=4
Factors are 1, 2, 4
S+d+q=10
4s+2d+q=20
∴. 3s+d =10
s=1: d=7, q=10-8=2
s=2: d=4, q=10-6=4
s=3: d=1, q=10-4=6
$D_1$ =6+5=11
$D_2$ =2+0=2----------→best
$D_3$ =2+5=7

| | |
|---|---|
| 4 | 8 |
| 3 | 7 |
| 2 | 6 |
| 1 | 5 |

| | | | |
|---|---|---|---|
| 10 | 12 | 14 | 16 |
| 9 | 11 | 13 | 15 |

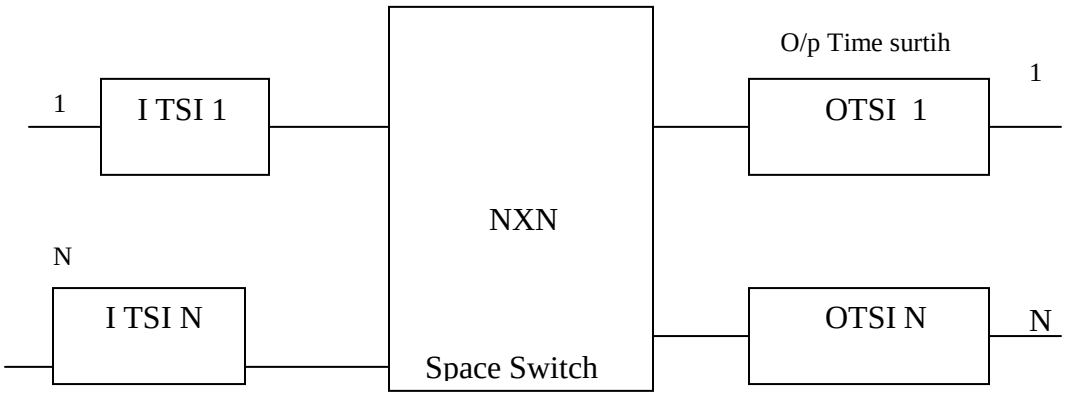
| | | | |
|---|---|---|---|
| 17 | 18 | 19 | 20 |
| | | | |
| | | | |
| | | | |

**Q5 (a) Briefly explain the time division space switch with the help of neat diagram. Also discuss its merits.**

**Answer** Figure 6.4, Page Number 190 of Text Book - II

**Q5 (b) Describe 3 stage TST combination switching network.**

**Answer**




**Q6 (a) Explain processor configurations used in SPC system.**

**Answer**

i. Worker and standby
ii. Load sharing
iii. Synchronous Operation

**Q6 (b) Discuss the steps involved in making a local call in signal exchange.**

**Answer** Page Number 182 of Text Book - I

**Q7 (a) What is Inband Signalling System and explain its operation with the help of a neat diagram.**

**Answer** Page Number 210 of Text Book - I

**Q7 (b) With neat sketch, explain Multi Framing Process of 30 channel PCM system.**

**Answer** Page Number 213 of Text Book - I

**Q8 (a) Write short note on Datagram and virtual circuits.**

**Answer** Page Number 242 of Text Book - I

**Q8 (b) Compare BUS and RING networks.**

**Answer**

1. In Bus network, highway can be passive hence more reliable. The failure one or more nodes does not interrupt service for others.

2. Additional nodes can be connected to a bus without disrupting network.
Adding nodes can not be connected ring without taking network out of service.

3. A bus n/w can be twisted pair or Co-axial cable because of both directions.

4. Bus n/w can suffer from signal reflection at impedance irregularities.

5. Fault isolation is difficult in bus

**Q9 Write short note on the following:**

**(i) Automatic Alternative Routing**
**(ii) Cellular Networks**

**Answer**
**(i)** Page Number 283 of Text Book I
**(ii)** Page Number 267 of Text Book I

## Text Books

**1. Telecommunications Switching, Traffic and Networks, J.E.Flood, Pearson Education, 2006.**

**2. Telecommunication Switching Systems and Networks, Thiagarajan Viswanathan, Prentice Hall of India Pvt. Ltd, 2006.**