

**Q.2 b. Explain the functions of the Switching System.**

**Answer:** Page Number 56 of Text Book

**Q.3 a. During the busy hour, 1200 calls were offered to a group of trunks and six calls were lost. The average call duration was 3 minutes.**

**Find:**

- |  |                                  |
|--|----------------------------------|
| <b>(i) The traffic offered</b>                             | <b>(ii) The traffic carried</b>  |
| <b>(iii) The traffic lost</b>                              | <b>(iv) The grade of service</b> |
| <b>(v) The total duration of the periods of congestion</b> |                                  |

**Answer:** Page Number 91 of Text Book

**b. Explain**

- |                            |                        |
|----------------------------|------------------------|
| <b>(i) Unit of traffic</b> | <b>(ii) congestion</b> |
|----------------------------|------------------------|

**Answer:** Page Number 88, 90 of Text Book

**Q4 b. Design a three stage network for connecting 100 incoming trunks to 100 outgoing trunks.**

**Answer:** Page Number 134 of Text Book

**Q.6 a. Explain the sequence of operations of call processing functions.**

**Answer:** Page Number 177 of Text Book

**b. What is State Transition diagram?**

**Answer:** Page Number 183 of Text Book

**Q.7 a. Explain the three bytes of signal units.**

**Answer:** Page Number 223 of Text Book

**b. What are the advantages of common-channel signalling principles?**

**Answer:** Page Number 218 of Text Book

**c. Draw the block diagram of Voice Frequency Receiver.**

**Answer:** Page Number 212 of Text Book

- Q.8 b.** An ATM network uses transmission links that operate at 150 Mbit/s and have a propagation delay of 5 $\mu$ s per km. It uses cells of length 53 octets, consisting of a 5-octet header and 48-bit information field. The maximum delay introduced by a switching centre is 300 cells. Find the maximum delay encountered by a telephone call over a connection of length 500 km that passes through six switching centres.

**Answer:** Page Number 248 of Text Book

- Q.9 a.** Write down the main advantages of ISDN. Give a brief description of ISDN protocol architecture.

**Answer:**

### **MERITS OF ISDN SYSTEM**

1. AN ISDN user can establish two simultaneous independent telecom calls on the existing pair of telephone wire.
2. The two simultaneous calls may be of any types as speech, data, image or video.
3. Using an ISDN line the data transfer rate with another ISDN system on dial up basis is 64 Kbps and it can go upto 128 Kbps.
4. With an ISDN line the video conferencing can be done with another ISDN subscriber on dial up basis
  - (a) Ordinary video conferencing of 128 Kbps on one ISDN line
  - (b) High quality video conferencing of 384 Kbps on three ISDN line

**ISDN protocol architecture –**

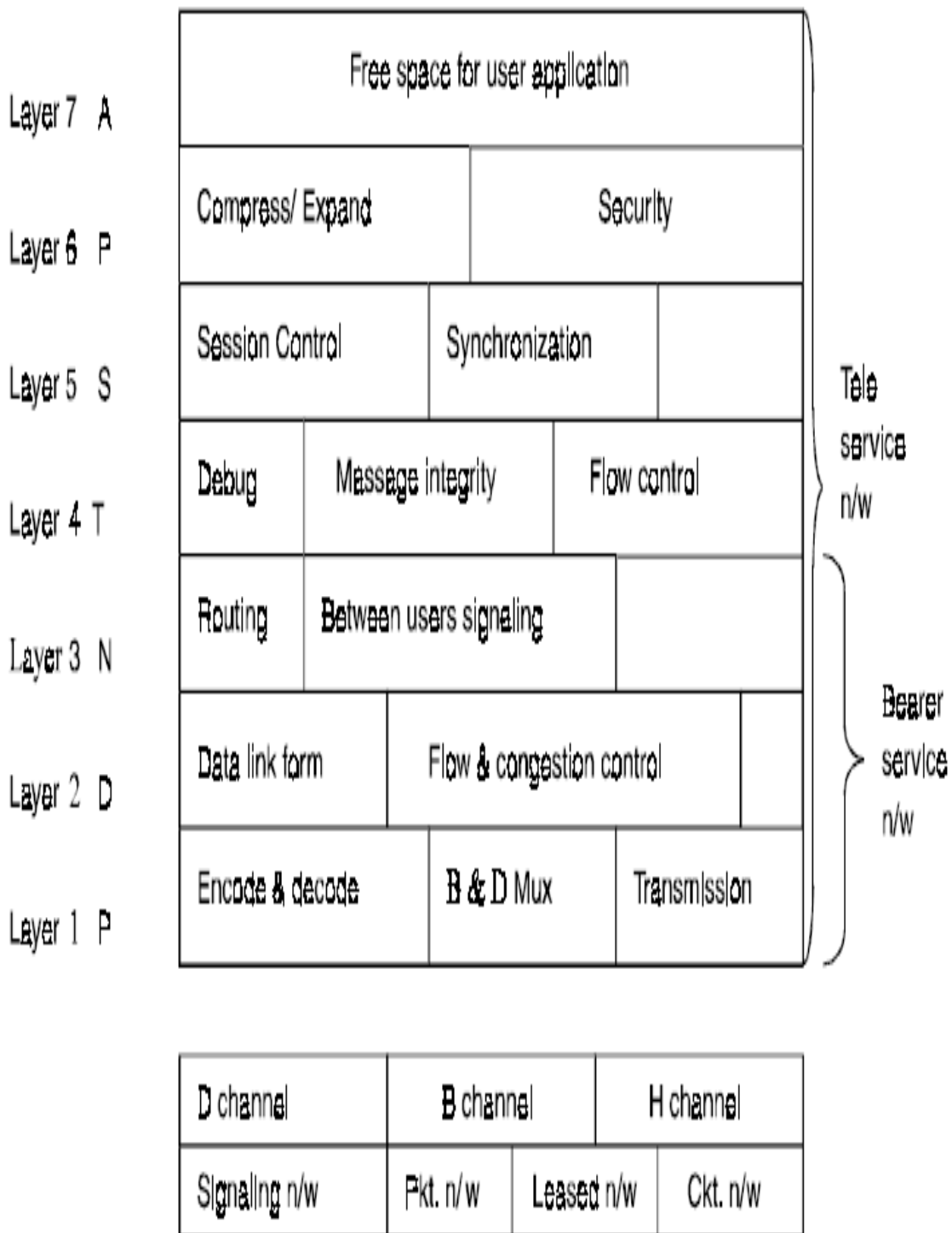


Fig. ISDN protocol architecture

ISDN protocol shows three layer architecture corresponding ISO-OSI seven layers. The three important layers used in ISDN are *physical layer*, *data link layer* and *network layer*. The functions of the three layers are pointed below.

The switching theory followed here is a nice compromise between packet switching and circuit switching. The network function also proves the fact.

**Layer 1:Physical layer**

1. Encoding and decoding of information.
2. Transmission of channel data.
3. Multiplexing to form basic and primary rate.
4. Making and breaking of physical circuit (as circuit switching).

**Layer 2:Data link layer**

1. Establishing and clearing data links.
2. Error, flow and congestion control.
3. Synchronization: matching the clocking frequency, phase of information at receiver side.

**Layer 3:Network layer**

1. Addressing and routing.
2. User-to-user signaling.
3. Activation and deactivation of network level connections.
4. Intra-network level multiplexing.
5. Multiplexing between different networks.

**b. What is an intelligent network? Explain**

- (i) **Node software.**
- (ii) **Service logic programs.**
- (iii) **Service logic execution environment.**

**Answer:** Page Number 270 of Text Book

**TEXT BOOKS**

- 1) **Telecommunications Switching, Traffic & Networks, J.E. Flood, Pearson Education- 2006.**
- 2) **Telecommunication Switching Systems & Networks, Thiagarajan Viswanathan, Prentice Hall of India Pvt. Ltd, 2007**