

BLDE Association's

**S. B. Arts & K.C.P. Science College,
Vijayapur - 586 103**

(Accredited at the B++ Grade with 2.99 CGPA in 4th cycle by NAAC)



MSc Programme

Internl Assessment Test Booklet

II Semester 2023

Name : Anusha Kulkarni

Roll No. : 4 R.C.U. Exam Seat No. P15KMP230001

Subject Code : _____

Subject : Data Communication & Computer Network

B.L.D. E. Association's

**S. B. ARTS & K. C. P. SCIENCE COLLEGE,
VIJAYAPUR**

Name of the Student : Anisha Kulkarni

Roll No. : 4 R.C.U. Seat No. : P15KH225036003

Subject Code No. : _____

Subject : Data Communication & Computer Networks

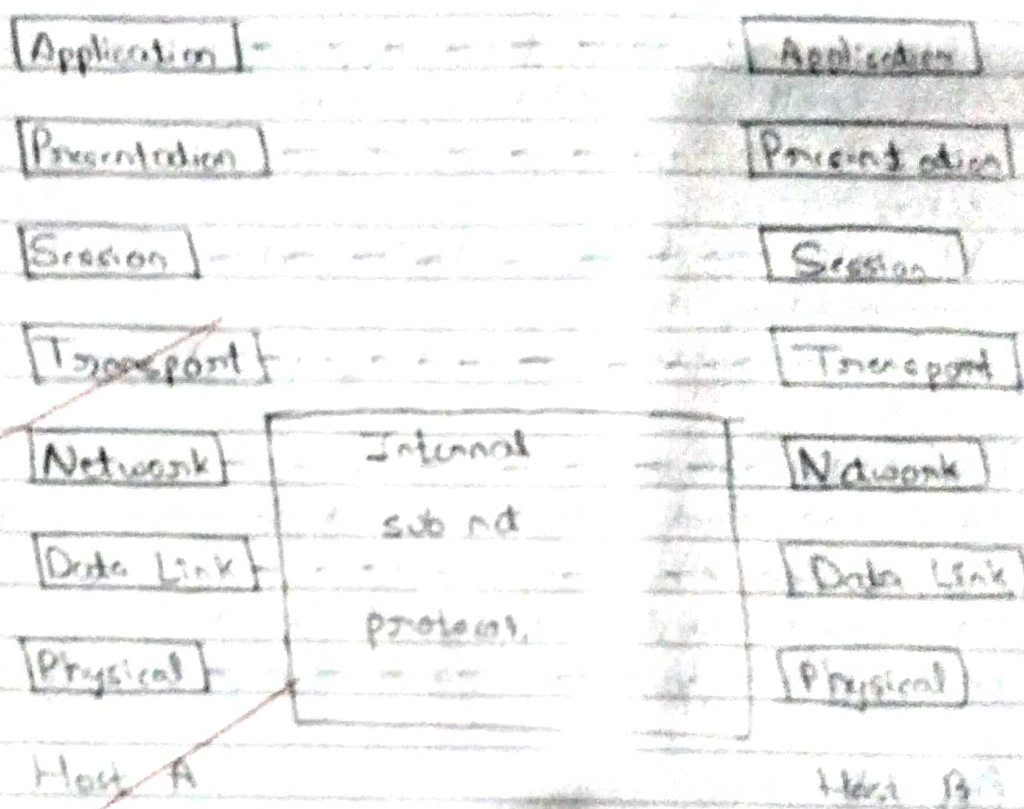
Test	Maximum Marks	Marks Obtained
First Test	02	02
Second Test	10	10
Third Test		
Total (Two best of three)	12	12


Signature of
Faculty


Signature of
Co-Ordinator


Signature of
Principal

- ③
- ★ The OSI model was developed by ISO in 1983.
 - ★ The systems which are open for communicating with other systems are called open communicating systems.
 - ★ The OSI model has 7 layers.



① Physical layer:

- ★ This layer function is to transmit the individual bits.
- ★ It describes how the two devices are connected physically.
- ★ It is lowest layer of OSI model.

② Data Link layer:

- ★ It ensures the error-free transfer of data frames.
- ★ It describes the format of data.

(iii) Network layer:

- * Its function is to operates the sub net.
- * It manages device addressing, tracks the location and send the data.

(iv) Transport layers

- * It ensures that the data must transport in the order which they are sent because the data must not be corrupted.
- * It receives packets from upper layer and divide into small unit called segments.

(v) Session :

- * It acts as dialog controller between the two communicating devices.
- * It receives acknowledgement of packets arrival time.

(vi) Presentation layer:

- * It is concerned with syntax and semantics of the information exchange.
- * It converts sender-dependent format to common format and common format to receiver dependent format.

(vii) Application layer:

- * It serves as windows for users to edit, create their files in remote computer.
- * It provides email forwarding and storage.

(6)

② * The received signal is changed from transmitted signal due to some unwanted disturbance is called transmission impairment.

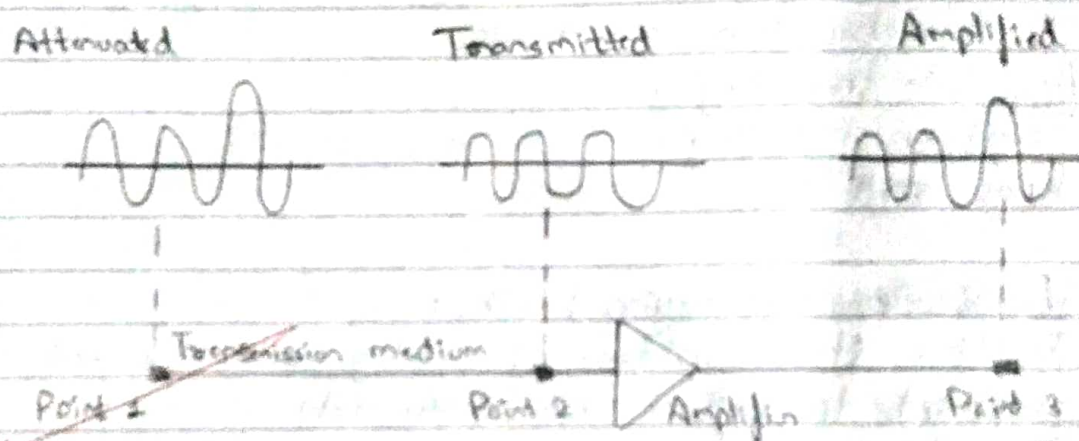
* The causes for transmission impairment are:

- (i) Attenuation
- (ii) Distortion
- (iii) Noise

(i) Attenuation

* Attenuation means loss of energy.

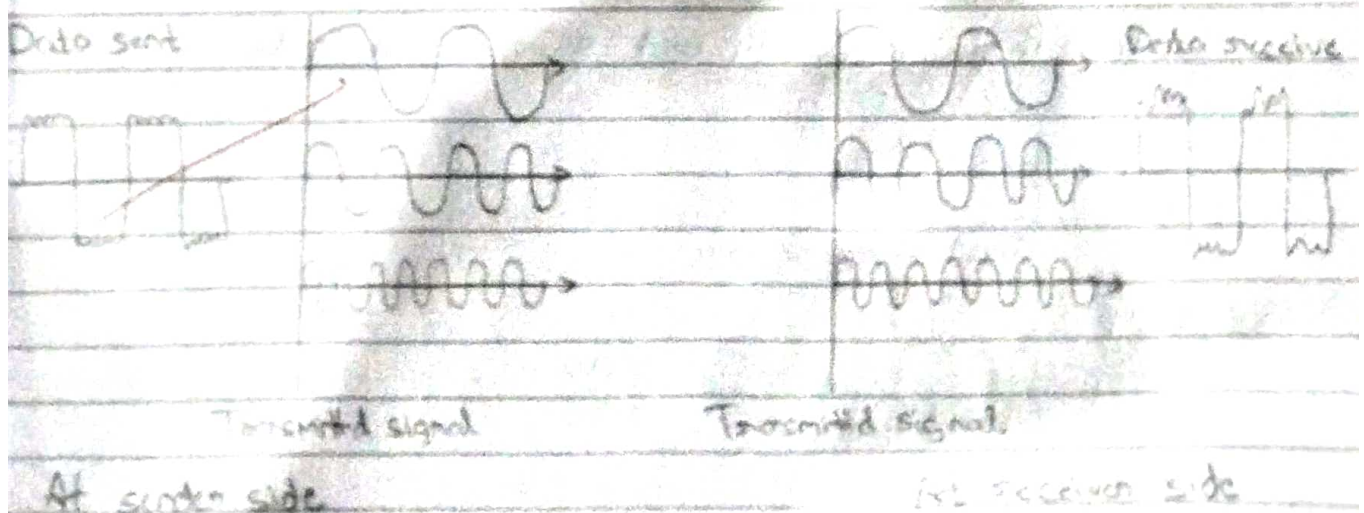
* The signal is transmitting suddenly it loss its energy due to some disturbance then it is amplified using amplifier.



(ii) Distortion:

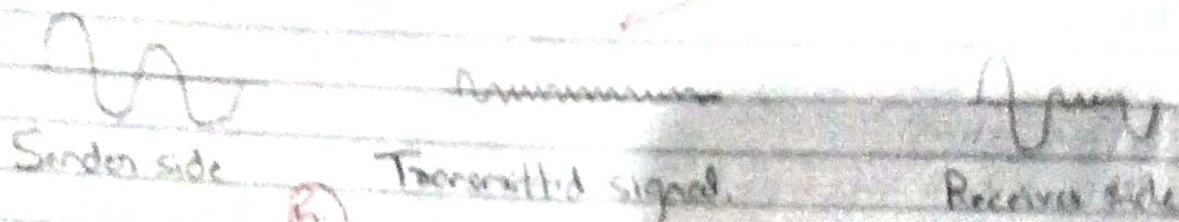
* Distortion means change in the form or shape of a signal.

* It occurs in composite signals of different frequencies.



(iii) Noise:

- ★ Noise is the major factor of transmission.
- ★ When unwanted signal adds to the transmitting signal the transmitted signal is modified.
- ★ At receiver end the unwanted signal cannot be removed.



(6) The conversion of digital data to analog signal is called as Digital-to-Analog conversion. This conversion is done by following methods.

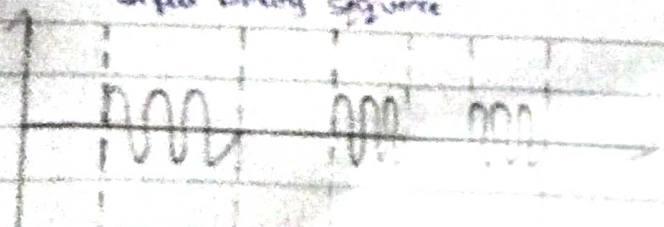
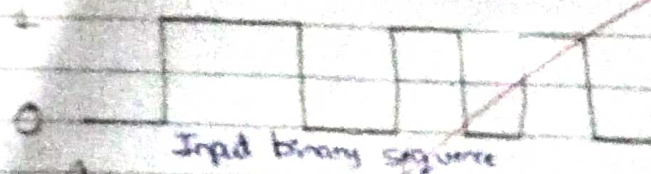
- Amplitude shift Keying
- Frequency shift Keying
- Phase shift Keying

(i) Amplitude shift Keying [ASK]:

- ★ In this, the amplitude of analog carrier signal is modified to reflect the binary data.
- ★ The frequency and phase of carrier signal remains constant.
- ★ The two types of ASK are binary amplitude shift keying [BASK] and on-off keying [OOK].
- ★ The bandwidth can be calculated by the formula

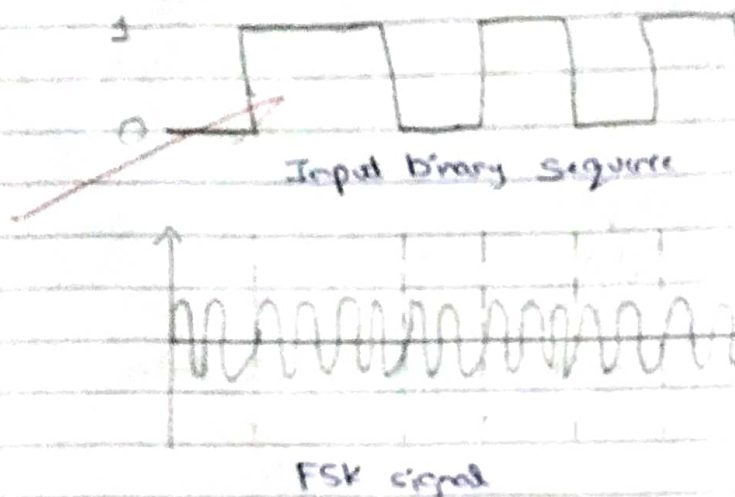
$$B = (1+d) \times S$$

Where B is bandwidth and S is signal rate



(ii) Frequency shift keying (FSK):-

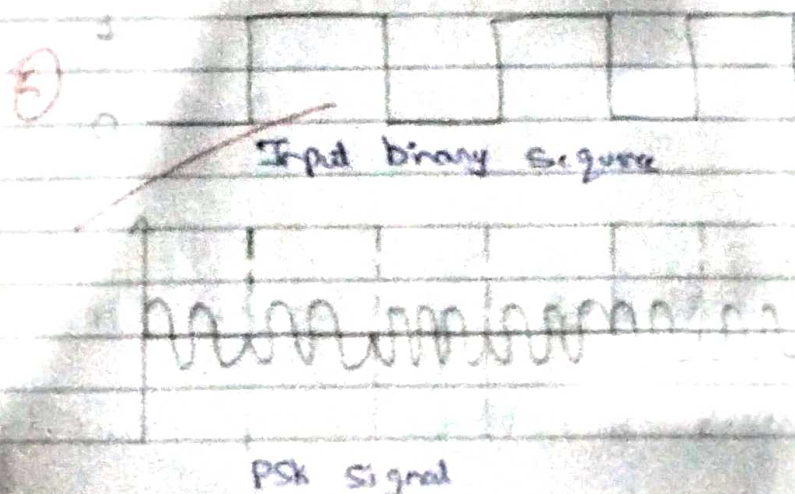
- In this the frequency of analog carrier signal is modified to reflect binary data.
- The amplitude and phase of carrier signal remains constant.
- The bandwidth can be calculated by the formula
$$B = (1+d) \times S \quad 2A_f$$



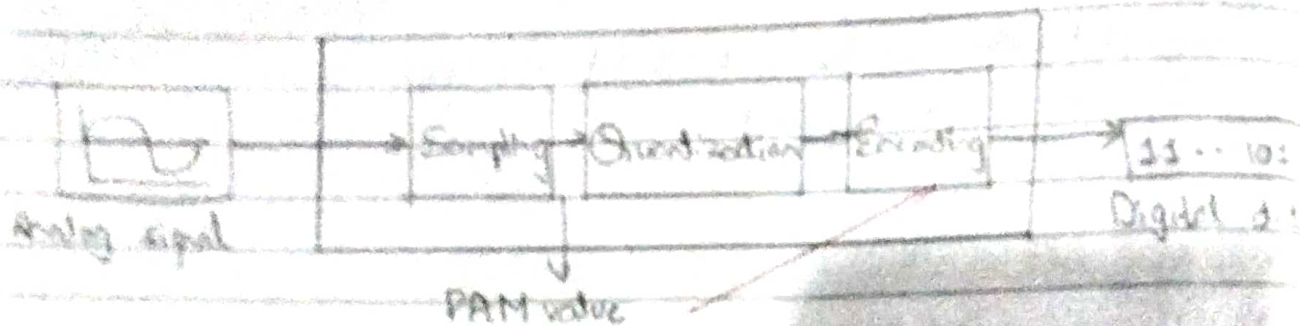
(iii) Phase shift keying (PSK):-

- In this the phase of analog carrier signal is modified to reflect binary data.
- The amplitude and frequency of carrier signal remains constant.
- The two types of PSK are binary phase shift keying (BPSK) and quadrature phase shift keying (QPSK).
- The bandwidth can be calculated by the formula
$$B = (1+d) \times S$$

Where B is bandwidth and S is signal rate



- ① The most basic common technique which is used to convert the analog signal into digital data is called pulse code modulation.



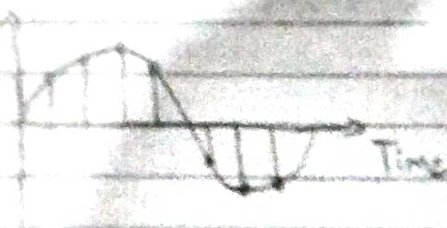
- The PCM involves three steps:
- ① The analog signal is sampled.
- ② The sampled signal is quantised.
- ③ The quantised signal is encoded to get digital data.

① Sampling:-

- The process changing the instantaneous amplitude of a analog signal in time.
- The signal is sampled in every T_s .
- The inverse of sampling is called as sample frequency that is given by $f_s = 1/T_s$.
- The three types of sampling are:

① Ideal sampling:

- The pulses of analog signal are sampled.
- It is also known as instantaneous sampling.



② Natural sampling:

- The pulses are charged as slanting and long, as slope of signal changes.
- It is practical method of sampling.



(i) Flat top sampling:

- In this sampling, the top of the pulses remains constant.



(ii) Quantization:

- The result of sampling signal is quantized between the maximum and minimum value of amplitude.

- The rules for quantization are:

(i) The amplitude between maximum and minimum value is defined as V_{max} and V_{min} .

(ii) We divide it into L zones of height d that is defined as $d = (V_{max} - V_{min}) / L$.

(iii) The normalized PAM value will be calculated by the formula $\text{amplitude} / d$.

(iv) We select the quantized value from middle of zone.

(v) The quantized error can be calculated as difference of quantized value and normalized PAM value.

(iii) Encoding:

- After quantization, the signal is encoded using a code to get the digital data.

