

ELECTRONIC MEASUREMENT & INSTRUMENTATION (BEC-29)



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UNIT-1

Lecture 8

Qualities, Measurements and Digital Display Devices

CONTENTS

Lecture 1:

- Performance Characteristics
- Error in measurement

Lecture 2:

- Types of static error
- Sources of error

Lecture 3 & 4:

- Arithmetic mean
- Deviation from the Mean
- Average Deviation
- Standard Deviation

Lecture 5 & 6:

- Limiting Errors
- LED

Lecture 7:

- LCD
- Incandescent Display

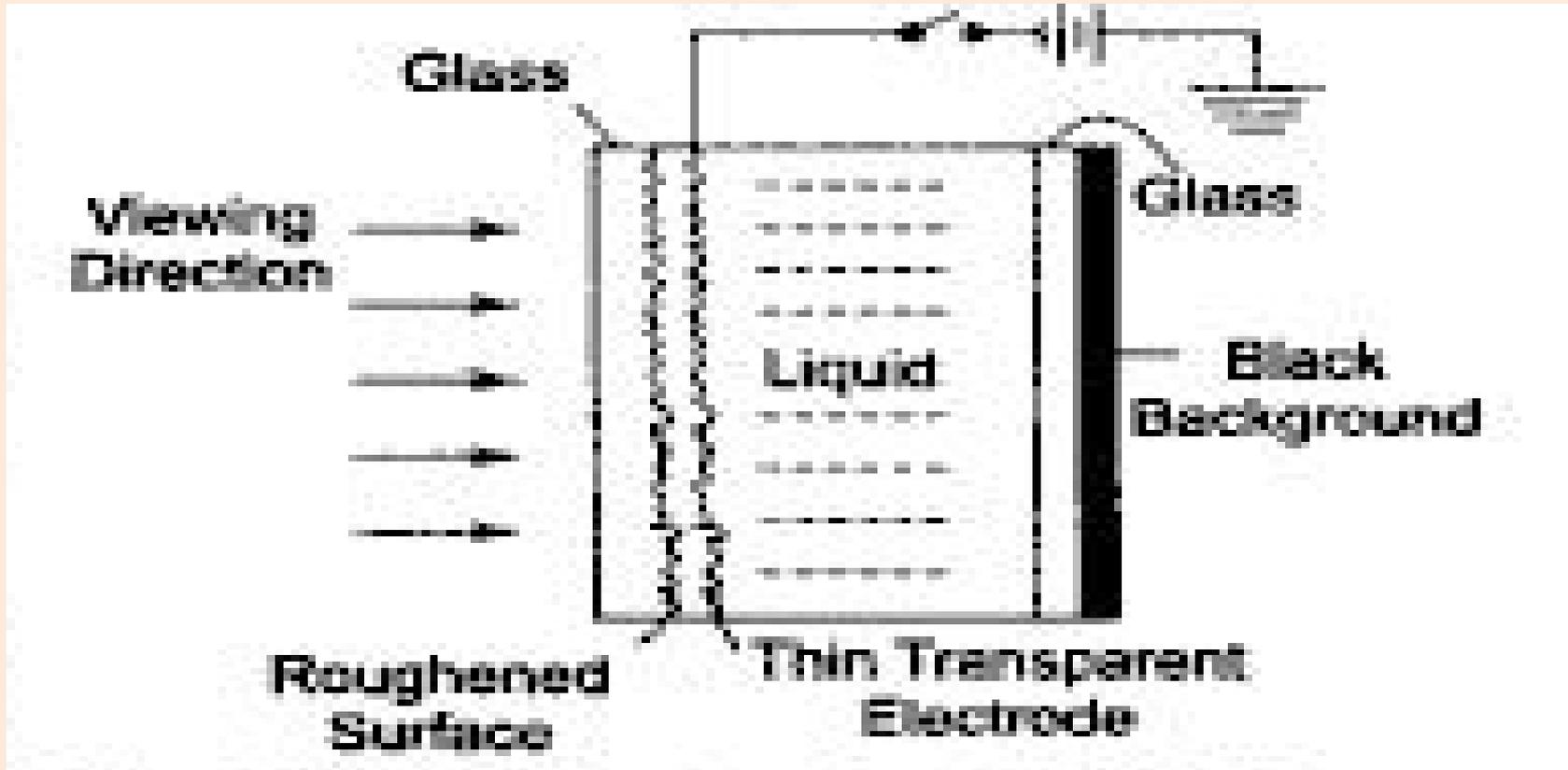
Lecture 8:

- LVD
- Printers

Lecture 9:

- Digital voltmeters
- Spectrum analyzer

Liquid Vapour Display (LVD)



- They employ a new passive display principle and depend upon ambient lights for their operation.
- It consist of a volatile liquid encased between glass and side spacers.

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- The rear glass plate has a black background and the front glass plate containing the liquid is roughened so that the liquid wets it.
- The transparent electrode is heated using a voltage drive, which is the basis for display function.
- To turn ON the device the voltage is applied across the transparent electrode. This causes sufficient heat to the electrode which evaporates the liquid in contact with it, and a mixture of vapor film and bubbles is formed at the roughened glass surface.
- There is a discontinuity established between the interface of front glass plate and the liquid which causes scattering of light. this makes it a display device.
- In the turn OFF condition, no voltage is applied across the electrode and the viewer sees a black background through the glass electrode and liquid.

Printers

Used to prepare a hard copy record of computer output.

They are classified into following types:

(1) **Impact and Non-impact.**

- **Impact Printers:** form character on paper by striking the paper through print head and squeezing an inked ribbon between paper and printer.
- **Non-Impact Printers:** do not involve any print mechanism between paper and printer.

(2) **Fully formed character and Dot matrix display**

- Are like those made by a standard typewriter—all parts of characters are embossed in the reverse on the type bars of typewriters. When printed all type characters are fully connected.

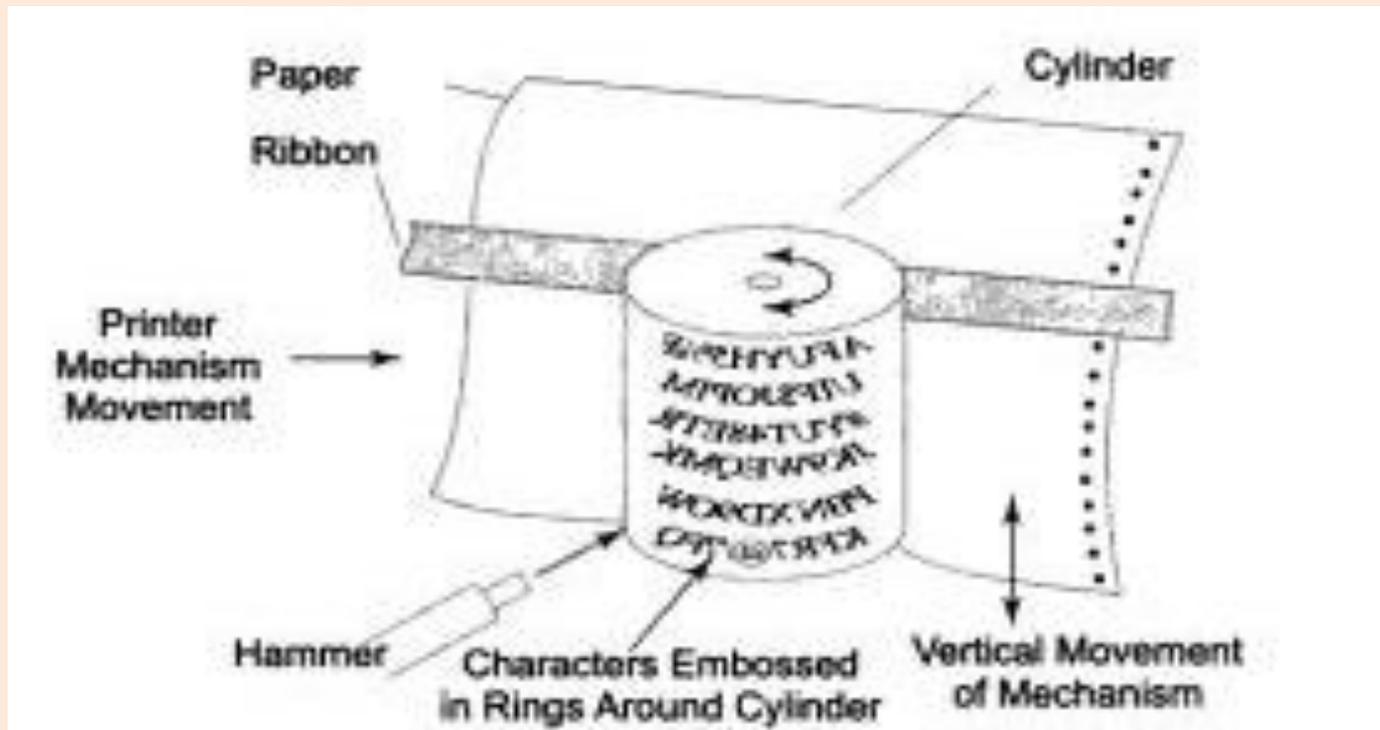
(3) **Character a time and line at a time printer**

- Character a time printer print each character serially and virtually instantaneously.
- Line at a time printer print each line virtually instantaneously.

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➤ Character a time impact printer for fully formed characteristics (DRUM WHEEL)

- Typewriter is a classic example of this printer, with character formed because each character fully embossed on type bar.
- Ordinary typewriters cannot be used with computers because they lack a computer coding interface for easy communication.



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➤ **Line at a time impact printers for fully formed characters (Line Printers)**

- Line printers are used for high volumes of printed output and less frequently in micro-computers, because of their high equipment cost relative to character at a time printers.

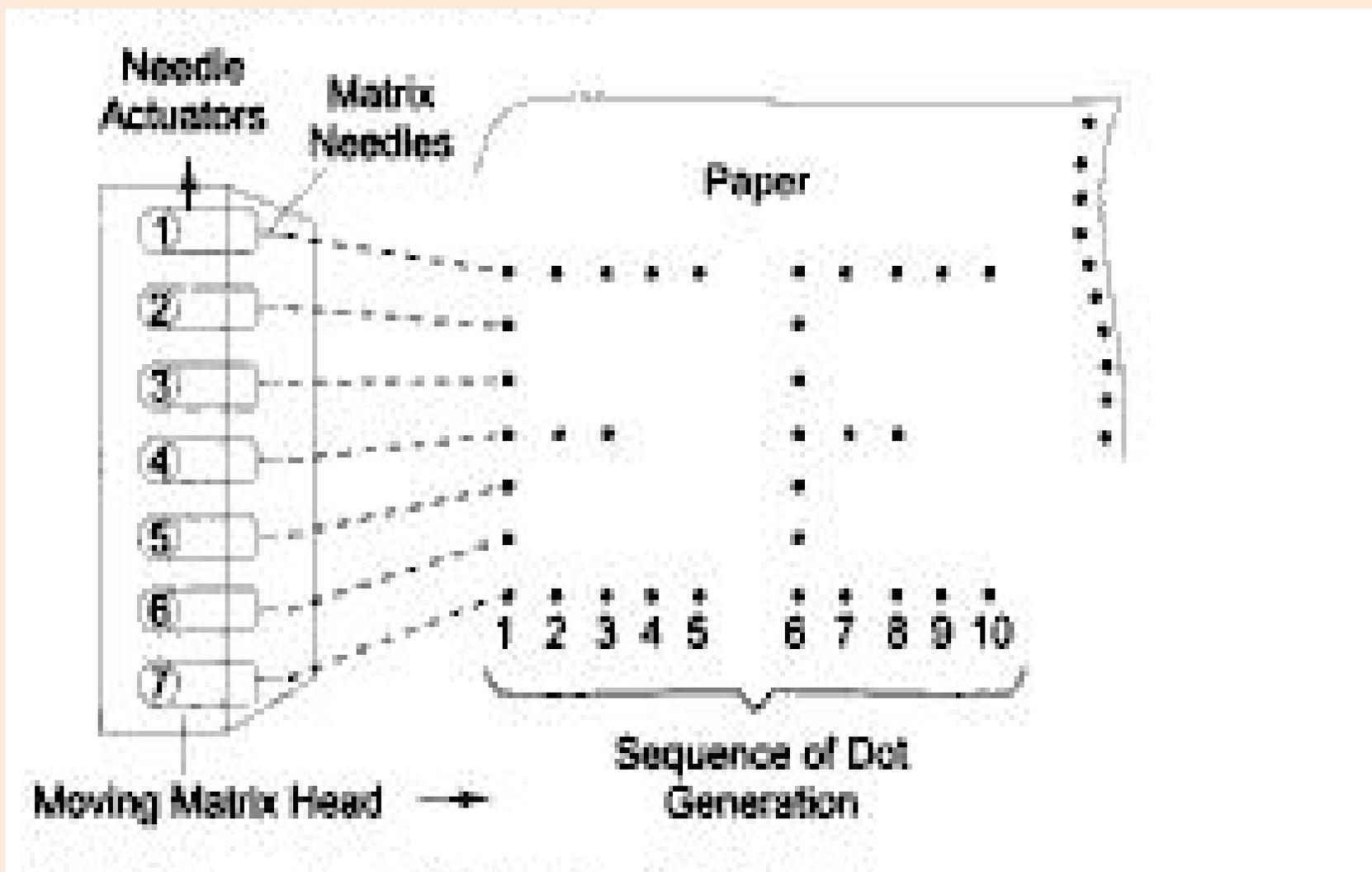
➤ **Dot matrix printers**

- Dot matrix characters are formed by printing a group of dots to form a letter or symbol.
- This method is widely used in mini- and micro-computers.
- Dot-matrix printers can print any combination of dots with all available print positions in the matrix. The character is printed when 128 ASCII codes is signalled and controlled by the ROM chip, which in turn controls the pattern of dots.

➤ **Character at a time dot matrix impact printer**

- The print head for an impact dot matrix character is usually composed with an array of wires arranged in a tabular form, that impact the character through an inked ribbon.
- The dot-matrix code of character is stored in EPROM. The fonts can be changed under the main program control, this is the main advantage of dot-matrix printer.

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➤ **Non- Impact dot matrix printers**

- Cause a mark without directly touching the paper.
- They cannot for carbon copies as there is no mechanism to impress the character through multiple carbon copies.
- They are of four types :
- Electro sensitive
- Electrostatic
- Inkjet
- Thermal

Assignment Questions

- What are printers? Where are they used? Explain the different types of printers.
- What do you mean by impact and non-impact printers?
- Explain the principle of operation of dot matrix printer.
- Which matrix is commonly used and why?
- Describe the operation of impact printers with the help of a diagram.

Conceptual Questions

- **What are two major types of impact printers?**
 - A. Football and Track
 - B. Passive Matrix and Dock Station
 - C. Dot Matrix and Character Impact
- **Which of the following uses liquid ink?**
 - A. inkjet
 - B. laser
 - C. thermal
 - D. Impact
- **Bubble jet and Piezoelectric are found in _____ printers.**
 - A. Inkjet
 - B. Laser
 - C. Thermal
 - D. Impact

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MCQ: Printer in which output is printed by the use of light beam and particles of ink infused on paper is best classified as

- A. character printer
- B. line printers
- C. laser printer
- D. beam printer

MCQ: Type of printer in which characters or letters are formed without the use of any mechanical impact is termed as

- A. page printers
- B. line printers
- C. impact printer
- D. non impact printer

MCQ: Situation in which printers are differentiated on the basis of characters, lines and pages to be printed is called

- A. sequence to print data
- B. impact to print data
- C. non impact printer
- D. font of characters

THANK YOU