

## **UNIT 4-WRITING SKILLS**

Technical writing is a practical writing that people as a part of their job written by pulley and ridden.

Topics covered

1. Stages of Writing -lecture 1

2. Difference between General and Technical writing-lecture 2

3. Technical terms-lecture 3

4. Technical description of a Refrigerator lecture 4

5. Technical Description of a Lathe Machine- lecture 5

6. Report and its importance.-lecture 6

7. Structure of the Formal Report-lecture 7

## . 1. Stages of Writing -lecture 1

There are five basic stages of the writing process namely **prewriting, drafting, revising, editing and publishing**. Each stage is precisely discussed here to represent a clear perception about the entire process of writing.

**Prewriting:** Prewriting is important as it is the first stage, where a writer choose the topic and narrows down the points as well as he determines the purpose of his writing. Additionally, the writer should consider his audience whom he needs to address. Find your idea and then try to develop your idea and accumulate pertinent information that support your idea. The next step is to plan and structure your idea.

**Drafting:** Drafting is nothing but putting your points and ideas on paper and arrange these points in a readable manner. Writers usually research about their topics at the prewriting stage and then they accumulate the entire information at this stage. First, the writers make a rough draft and then they try to arrange their points in a best possible way and gradually prepare the final draft.

**Revising:** Revising is another imperative stage, where a draft is scrutinized thoroughly and points incorporated in the draft are rearranged. At this stage, new points are added and some points are replaced and removed as per the requirements. However, revision is indispensable to make the outlook of the writing catchy and cogent.

**Editing:** Fine the tone of the writing and check each line thoroughly. Check spelling, grammar, punctuation, sentence structure, document format and other things. Check the entire content as mistakes should not leave behind. However, editing is the stage where writers can modify their lines as well as theme. It is always better to give your writing to someone for editing.

**Publishing:** Publishing is the last stage where writers submit their work to the publisher. Make sure your written document should be completed before giving to the publisher. However, each writer's goal is to publish his work and reach to the readers.

## Lecture 2

### **Technical writing:**

Technical writing raises the basic postulate of science that is a systematic investigation which may be reproduced and varied by other people. It is a typical form of writing, different from expressive, expository or descriptive writing

### **Difference between technical and general writing:**

- Though the basics remain the same (both need to engage the reader and must be free from spelling mistakes and grammatical errors), technical writing is considered a little more difficult than general writing as it needs to provide information in a clear cut manner that the reader is able to assimilate and understand.
- Technical writing and general differ from each other on the basis of their purpose. General writings including poetry, novel, drama, short story and some other types of writing aim at amusing and inspiring the readers which is the crop of free and imaginative thinking. But technical writings include report, resume, proposal and the like, primarily aim at imparting information, instruction and explanation
- The language of technical writing should be simple but effective while a creative writer may indulge in extravagant and pompous choice of words
- The difference between technical writing and general writing is also with regard to style. General or literally writing and general writing is also with regard to style. General or literally writings are cast in personal or subjective style whereas technical or professional writings are supposed to be free from personal bias. Objective or impersonal style is the hall mark of technical writing. General writing including fiction or other expressive writing may be highly imaginative, employing figurative word usage and symbolism or fictitious facts and characters. Technical document is always based on facts
- General writing is more about arousing the interest of the reader whereas technical writing has the sole objective of making the reader understand a topic in an interesting manner.
- Technical writing has general guidelines to follow and it has to be clear and concise. It has to be in first person and avoid passive voice.

## Lecture 3

### Technical terms:

#### Q1. What do you understand by the term 'Definition'

**Definition** is a concise statement; of the most significant aspects/constituents/features of an object or idea. The term is a word or phrase conveying precise, limited meaning in the context in which it is used.

**1. Molecule:** a group of atoms bonded together, representing the smallest fundamental unit of a chemical compound that can take part in a chemical reaction.

**2. Kinetic energy** - The energy of an object due to its motion.

**3. Gravitation:** movement, or a tendency to move, towards a centre of gravity, as in the falling of bodies to the earth.

**4. Computer:** an electronic device which is capable of receiving information (data) in a particular form and of performing a sequence of operations in accordance with a predetermined but variable set of procedural instructions (program) to produce a result in the form of information or signals.

**5. Atom:** An atom is the defining structure of an element, which cannot be broken by any chemical means. A typical atom consists of a nucleus of protons and neutrons with electrons orbiting this nucleus.

**6. Multimedia:** a multimedia Application is an Application which uses a collection of multiple media sources e.g. text, graphics, images, sound/audio, animation and/or video.

**7. Velocity:** a measure of the rate of motion of a body expressed as the rate of change of its position in a particular direction with time. It is measured in metres per second, miles per hour, etc

**8. Hardware:** the machines, wiring, and other physical components of a computer or other electronic system.

**9. Electrolysis:** chemical decomposition produced by passing an electric current through a liquid or solution containing ions. Momentum: the quantity of motion of a moving body, measured as a product of its mass and velocity.

**10. Modem:** A modem (modulator-demodulator) is a device that modulates signals to encode digital information and demodulates signals to decode the transmitted information. The goal is to produce a signal that can be transmitted easily and decoded to reproduce the original digital data. Modems can be used with any means of transmitting analog signals, from light emitting diodes

to radio. A common type of modem is one that turns the digital data of a computer into modulated electrical signal for transmission over telephone lines and demodulated by another modem at the receiver side to recover the digital data.

**11. Refrigeration:** is a process in which work is done to move heat from one location to another. The work of heat transport is traditionally driven by mechanical work, but can also be driven by heat, magnetism, electricity, laser, or other means.

**12. E-business/commerce:** a company that does all or most of its transactions through the Internet.

**13. Ion:** an atom or molecule with a net electric charge due to the loss or gain of one or more electrons.

**14. Machine:** an apparatus using mechanical power and having several parts, each with a definite function and together performing a particular task.

**15. Mass:** In physics, mass is a property of a physical body which determines the body's resistance to being accelerated by a force and the strength of its mutual gravitational attraction with other bodies.

**16. Define Force and engineering.**

**17. Force:** Force is a quantitative description of the interaction between two physical bodies, such as an object and its environment. Force is proportional to acceleration. In calculus terms, force is the derivative of momentum with respect to time.

**18. Engineering:** the branch of science and technology concerned with the design, building, and use of engines, machines, and structures.

19. **Electrolyte** - a solution that conducts a certain amount of current and can be split categorically as weak and strong electrolytes.

## Lecture 4

### Technical Description of a Refrigerator

**Introduction: In everyday terms a refrigerator is:** a kitchen appliance that cools the temperature of foodstuffs stored in it by the act of *refrigeration*, a mechanical/chemical process of lowering the contained temperature of a container.

It consists of a thermally insulated compartment and a heat pump (mechanical, electronic, or chemical) that transfers heat from the inside of the fridge to its external environment so that the inside of the fridge is cooled to a temperature below the ambient temperature of the room. Refrigeration is an essential food storage technique in developed countries. Lower temperatures in a confined volume lower the reproduction rate of bacteria, so the refrigerator reduces the rate of spoilage.

**Principle :** A refrigerator maintains a temperature a few degrees above the freezing point of water. Optimum temperature range for perishable food storage is 3 to 5 °C (37 to 41 °F). A similar device that maintains a temperature below the freezing point of water is called a **freezer**. The refrigerator replaced the icebox, which was a common household appliance for almost a century and a half prior advent of **refrigerator**. The vapor-compression cycle is used in most household refrigerators as well as in many large commercial and industrial refrigeration systems. Figure 1 provides a schematic diagram of the components of a typical vapor-compression refrigeration system.

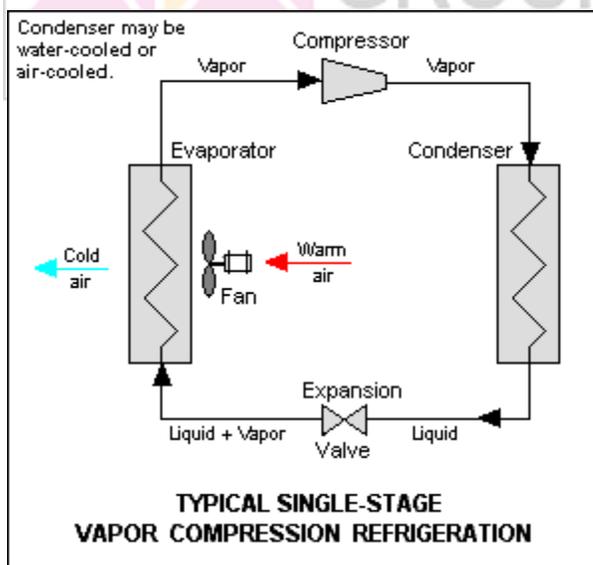


Figure 1: Vapor compression refrigeration

The refrigeration system makes a cold room work. It is simply a process of transporting heat from one place to another. The vapour-compression system is the most commonly used method of refrigeration. It is frequently used in large cold rooms like industrial chillers.

The main components of a refrigeration system are the condenser, the compressor, the evaporator and the expansion valve.

### 1. Condenser

Condensation changes gas to a liquid form. Its main purpose is to liquefy the refrigerant gas sucked by the compressor from the evaporator. As condensation begins, the heat will flow from the condenser into the air, only if the condensation temperature is higher than that of the atmosphere. The high-pressure vapour in the condenser will be cooled to become a liquid refrigerant again, this time with a little heat. The liquid refrigerant will then flow from the condenser to a liquid line.

### 2. Compressor

The compressor's use is to pull the low-temperature and low-pressure vapour from the evaporator, through a suction line. Once the vapour is drawn, it will be compressed. This will cause the vapour's temperature to rise. Its main function is to transform a low-temperature vapour in to a high-temperature vapour, to increase pressure. Vapour is released from the compressor into a discharge line.

### 3. Evaporator

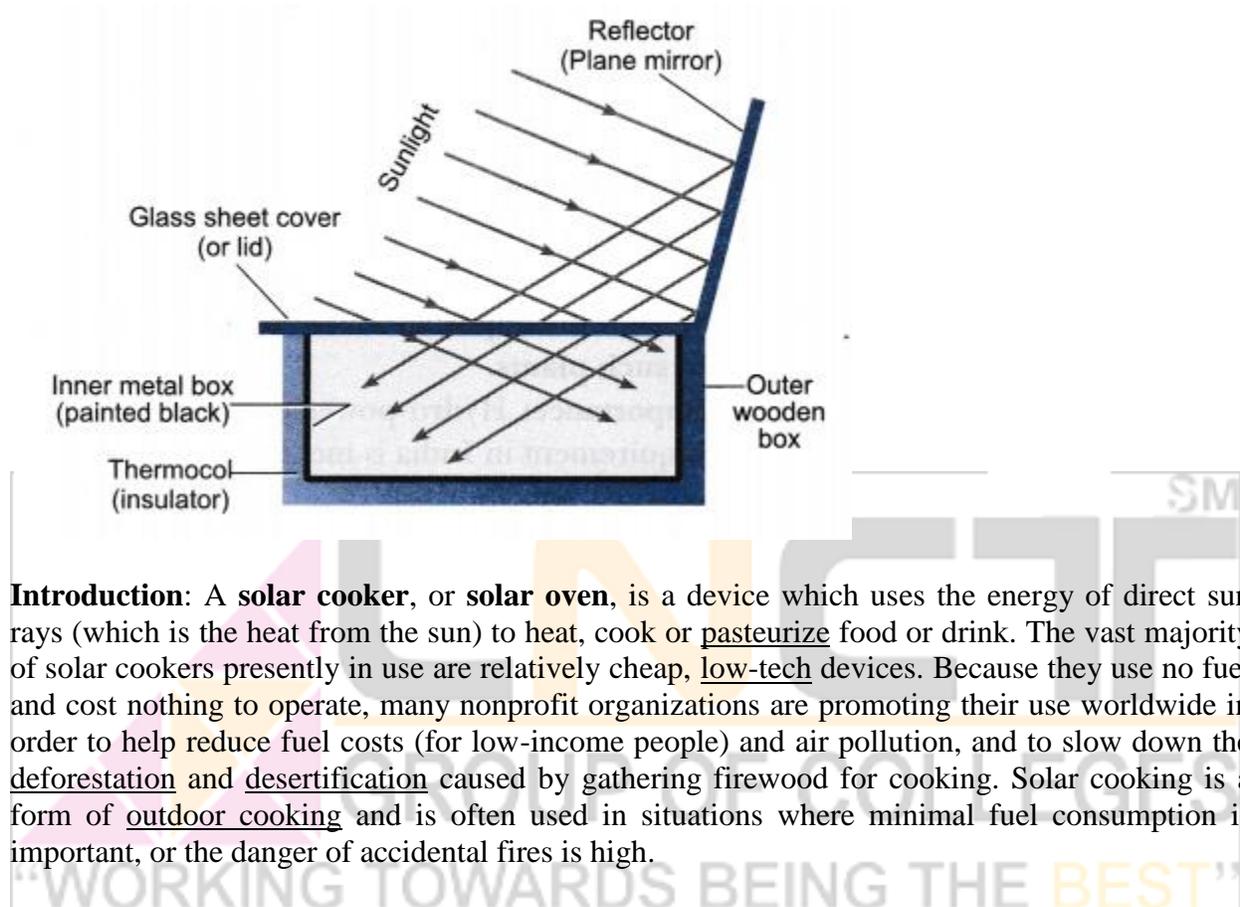
An evaporator is used to turn any liquid material into gas. In this process, heat is absorbed. The evaporator transfers heat from the refrigerated space into a heat pump through a liquid refrigerant, which boils in the evaporator at a low-pressure. In achieving heat transfer, the liquid refrigerant should be lower than the goods being cooled. After the transfer, liquid refrigerant is drawn by the compressor from the evaporator through a suction line. Liquid refrigerant will be in vapour form upon leaving the evaporator coil.

### 4. Expansion Valve

Commonly placed before the evaporator and at the end of the liquid line, the expansion valve is reached by the liquid refrigerant after it has been condensed. Reducing the pressure of the refrigerant, its temperature will decrease to a level below its atmosphere. This liquid will then be pumped into the evaporator.

## Lecture 5

### Technical Description of a Solar Cooker



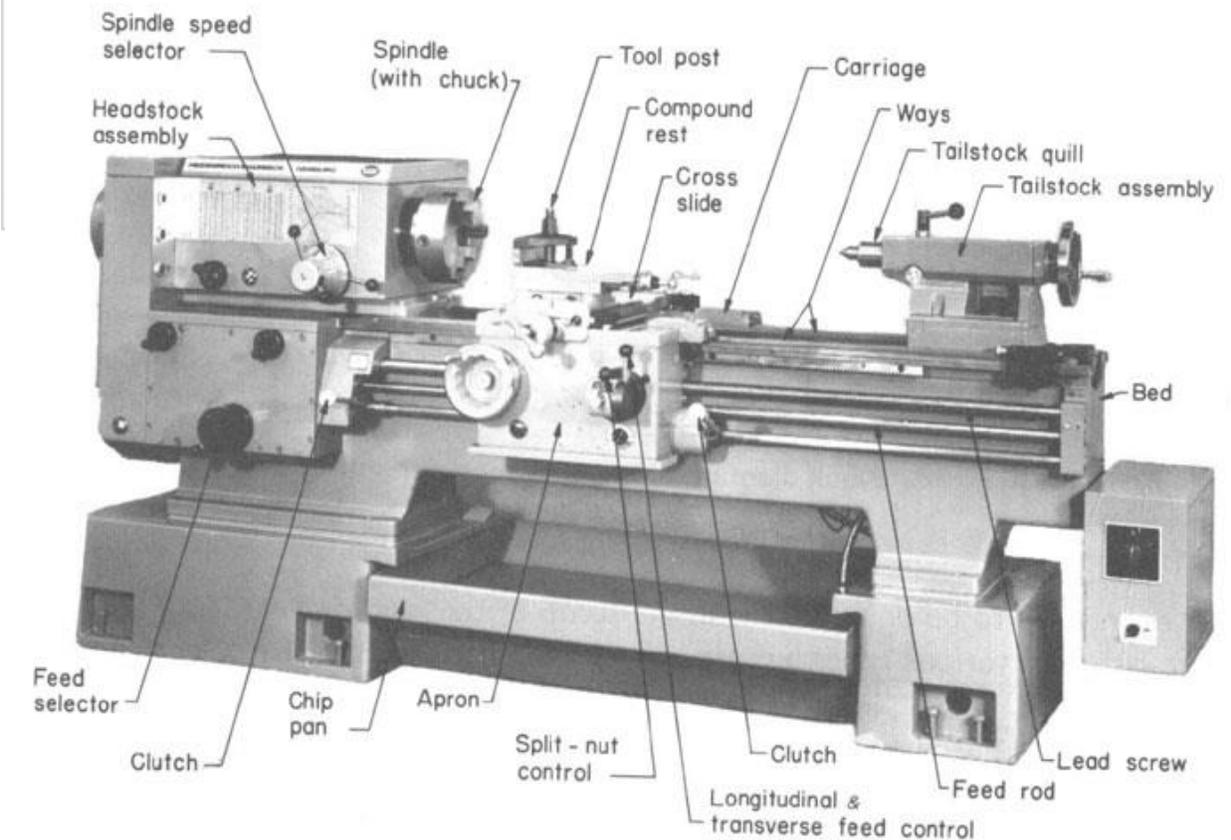
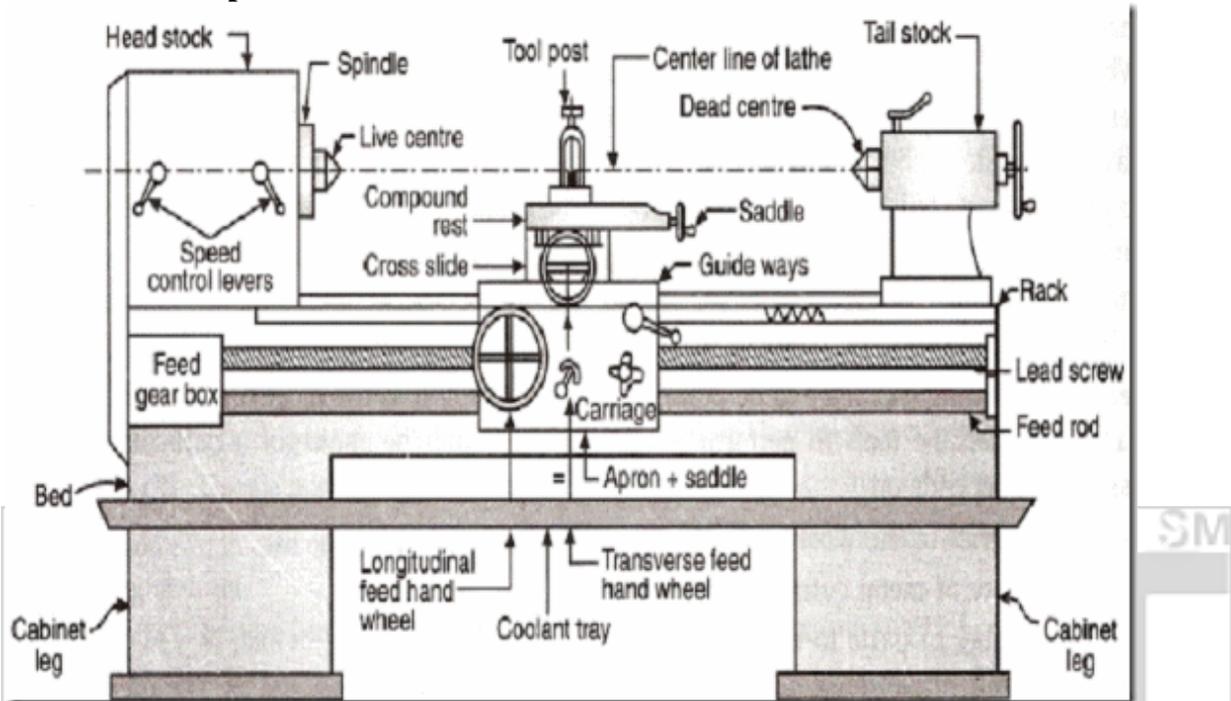
**Introduction:** A **solar cooker**, or **solar oven**, is a device which uses the energy of direct sun rays (which is the heat from the sun) to heat, cook or pasteurize food or drink. The vast majority of solar cookers presently in use are relatively cheap, low-tech devices. Because they use no fuel and cost nothing to operate, many nonprofit organizations are promoting their use worldwide in order to help reduce fuel costs (for low-income people) and air pollution, and to slow down the deforestation and desertification caused by gathering firewood for cooking. Solar cooking is a form of outdoor cooking and is often used in situations where minimal fuel consumption is important, or the danger of accidental fires is high.

**Working Principle:** Simple solar cookers use the following basic principles:

- **Concentrating sunlight:** A reflective mirror of polished glass, metal or metallised film concentrates light and heat from the sun on a small cooking area, making the energy more concentrated and increasing its heating power.
- **Converting light to heat:** A black or low reflectivity surface on a food container or the inside of a solar cooker improves the effectiveness of turning light into heat. Light absorption converts the sun's visible light into heat, substantially improving the effectiveness of the cooker.
- **Trapping heat:** It is important to reduce convection by isolating the air inside the cooker from the air outside the cooker. A plastic bag or tightly sealed glass cover traps the hot air inside. This makes it possible to reach temperatures on cold and windy days similar to those possible on hot days. Greenhouse effect: Glass transmits visible light but blocks infrared thermal radiation from escaping. This amplifies the heat trapping effect.

**Lecture 6**

**Technical Description of Lathe Machine:**



### Introduction:

Lathe is a machine tool used to remove unwanted material from a given work piece to get desired shape. It is generally used for machining cylindrical work pieces. A cylindrical work piece is mounted on a suitable work holding device (e.g: chucks, centres). A single point cutting tool is mounted on the tool post. The work piece is rotated continuously by rotating the head stock spindle. The single point cutting tool is fed against the circumferential area of the work piece. Unwanted material is removed and a cylindrical job with smooth surface finish is obtained. A **lathe** is a machine tool which rotates the workpiece on its axis to perform various operations such as cutting, sanding, knurling, drilling, or deformation, facing, turning, with tools that are applied to the work piece to create an object which has symmetry about an axis of rotation.

### Explanation of the standard components of most lathes:

1. **Bed:** Usually made of cast iron so provides a heavy rigid frame.
2. **Ways:** Inner and outer guide rails that are precision machined parallel to assure accuracy of movement.
3. **Headstock:** mounted in a fixed position on the inner ways, usually at the left end. Using a chuck, it rotates the work.
4. **Gearbox:** inside the headstock, providing multiple speeds with a geometric ratio by moving levers.
5. **Spindle:** Hole through the headstock to which bar stock can be fed, which allows shafts that are up to 2 times the length between lathe centers to be worked on one end at a time.
- 6 **Chuck:** allows the mounting of difficult workpieces that are not round, square or triangular.
7. **Tailstock:** Fits on the inner ways of the bed and can slide towards any position the headstock to fit the length of the work piece. An optional taper turning attachment would be mounted to it.
8. **Tailstock Quill:** Has a Morse taper to hold a lathe center, drill bit or other tool.
9. **Carriage:** Moves on the outer ways. Used for mounting and moving most the cutting tools.
10. **Cross Slide:** Mounted on the traverse slide of the carriage, and uses a hand wheel to feed tools into the work piece.
11. **Tool Post:** To mount tool holders in which the cutting bits are clamped.
12. **Compound Rest:** Mounted to the cross slide, it pivots around the tool post.
13. **Apron:** it has the mechanism and controls for moving the carriage and cross slide.
14. **Feed Rod:** Has a keyway, with two reversing pinion gears, either of which can be meshed with the mating bevel gear to forward or reverse the carriage using a clutch.
15. **Lead Screw:** For cutting threads.
16. **Split Nut:** When closed around the lead screw, the carriage is driven along by direct drive without using a clutch.
17. **Quick Change Gearbox:** Controls the movement of the carriage using levers.
18. **Steady Rest:** Clamped to the lathe ways, it uses adjustable fingers to contact the work piece and align it.
20. **Follow Rest:** Bolted to the lathe carriage, it uses adjustable fingers to bear against the work piece opposite the cutting tool to prevent deflection.

## Lecture 7

**Report writing** The word report has originated from the latin word Reportare. Re means again and portare means to bring back. So a Report can carry the information to the reader who was not physically present at the time of the incident. Sharma and Mohan define a technical report in the book "**Business Correspondence and Report Writing.**"

A written statement of the facts of a situation, project, process or test; how these facts were ascertained; their significance; the conclusions that have been drawn from them; and [in some cases] the recommendations that are being made" in

"A technical report is a document written by a researcher detailing the results of a project and submitted to the sponsor of that project." A report is written for a clear purpose and for a specific reader. Specific information and evidence are presented, analysed and applied to a particular problem or issue. The information is presented in a clearly structured format making use of sections and headings so that the information is easy to locate and follow. The report may provide the outline about the purpose, reader, occasion and problem or issue that the report must address. Technical reports may contain data, design criteria, procedures, literature reviews, research history, detailed tables, illustrations/images, explanation of approaches that were unsuccessful. A Report can be written for many disciplines: Physical sciences, engineering, agriculture, biomedical sciences, and the social sciences. education etc. A report is a document that presents information in an organized format for a specific audience and purpose. Although summaries of reports may be delivered orally, complete reports are almost always in the form of written documents.

In "Contemporary Business Reports," Kuiper and Clippinger define business reports as "organized, objective presentations of observations, experiences, or facts used in the decision-making process."

**Report** is important for

- 1. Decision Making:** Today's complex business organizations require thousands of information. Reports provide the required information. A large number of important decisions in business or any other areas are taken on the basis of information presented in the report.
- 2. Investigation:** Whenever there is any problem, a committee or commission or study group investigates the problem to find out the reason behind the problem and present the found output with or without the recommendation in the form of a report.
- 3. Evaluation:** Large scale organizations are engaged in multidimensional activities. It is not possible for a single top executive to keep personal watch on what others are doing. So, the executive depends on reports to evaluate the performance of various departments or units.
- 4. Quick Location:** Executives are busy hence they need vital sources of information. Such sources can be business report.

## Structure of a Formal Report or Letter Text Style Report

Preliminary(Prefatory parts)	Body or Main part	Supplementary Parts
1. Cover	11. Introduction	15. Appendix
2. Title Page	12. Body	16. References
3. Copyright Notice	13. Conclusion	17. Bibliography
4. Letter of Transmittal	14. Recommendation	18. Glossary
5. Acknowledgement		19. Index
6. Letter of Authorization		
7. Preface		
8. Table of Contents		
9. List of Illustrations		
10. Synopsis or Executive Summary		

### Preliminary(Prefatory parts)

- Cover Page** It is the first page of the Report. It protects the report. It has the logo or watermark of the company. It is of light or neutral color. It is made of a thick paper. Name of the writer of the report, title, Date of Submission, classification-whether confidential or open, number-report number is mentioned on the Cover Page. It gives an elegant appearance to the Report. If any webpage is superimposed in the cover then it forms the **Frontispiece** and generally finds its place in Reports that are published.

#### Confidential Report No.

**Indian Economy from 2010-2020**

**Prepared by**

**Shamona Jones**

**Secretary**

**Economic Forum**

### 2. Title Page

It is the first right hand page of the Report. This page is similar to the Cover Page except that it contains the following additional information: Name and the designation of the intended reader, Name and the designation of the approving authority (It may require the approval of an intermediary).

<p>Economy</p> <p>2020</p> <p style="text-align: center;">Prepared for</p> <p>-----</p> <p>-----</p>	<p>Indian</p> <p>2010-</p>
<p>Approved by</p> <p>-----</p> <p>-----</p>	<p>By</p> <p>-----</p> <p>-----</p> <p>Economic Forum</p>

### 3. Copyright notice

Copyright ownership gives the owner the exclusive right to use the work, with some exceptions. When a person creates an original work, fixed in a tangible medium, he or she automatically owns copyright to the work. If somebody wishes to reproduce the work then he has to take the prior permission or pay some royalty.

### 4. Letter of Transmittal

is a brief business letter sent along with another type of communication such as a longer document like a proposal response to an enquiry or payment it provides a way to let the recipient understand what is being sent and why they received it and who it is from

5. **Acknowledgement** report t covers gratitude expressed by the writer for those who helped indirectly or indirectly in the preparation of the report.
6. **Letter of Authorization** or forwarding letter is a formal authority letter requesting writer to prepare a report which may be attended to the main report if required.
7. **Preface** provides an overall idea about the substance of the report it is written at last in the report writing process but placed in the front matter its States what the report is all about and the circumstances under which the report is written the author tries to build a support with its readers by discussing the content of report and the uses to which it can be put.
8. **Table of Contents** is a list of headings and subheadings of the report with proper number in indentation and page number to help the reader locate a specific material in a report table of content is prepared at a primitive stage of writing a report can actually help in organizing a material assembly.
9. **List of Illustrations**-It may appear at the front of a book, gives a **list** of photographs, drawings, tables, or other types of **illustrations** used to support the contents of the book.
10. **Summary** – is the report in nutshell it has a proper beginning middle end jitendra sizes on the presentation on the presentation of the various elements in the report in short form introduction prepare The Reader for the content of the report hand practice familiar with the subject
11. **Introduction** – The first page of the report needs to have an introduction. You will explain the problem and show the reader why the report is being made. You need to give a definition of terms if you did not include these in the title section, and explain how the details of the report are arranged.
12. **Body** – This is the main section of the report. There needs to be several sections, with each having a subtitle. Information is usually arranged in order of importance with the most important information coming first. in the introduction results prepared by methodology are discussed in an organised manner illustrations explanation interpretation of data is done objectively under this ad at the end of the discussion some conclusion no new material is added sample evidences provided to support conclusion
13. **Conclusion** – This is where everything comes together. Keep this section free of jargon as most people will read the Summary and Conclusion. conclusion provides a definite sense of completion of a project.

**14. Recommendations** – This is what needs to be done. In plain English, explain your recommendations, putting them in order of priority. Recommendations suggestions bi report writer help in deciding the action to be taken in general such recommendation should be bias and should be based on facts and presented and scientific manner.

**15. Appendices** – This includes information that the experts in the field will read. It has all the technical details that support your conclusions. Appendix includes is included in the back matter contains 8 supplementary information matter that cannot be placed in the report and break unity of the thought is place there graph charts statistical information that lacks direct relevance.

**16. List of references-** in it matter from many published and unpublished works are quoted. The author should be given due credit by citing them in the text and listing them at the end of the report. The entries in the list with details like name of the author, paper name, publication and the year is mentioned. If the number of references is very small then they can be mentioned in the footnotes. In scholarly papers and research papers the APS style for reference list is also called the work cited list

**17. Bibliography-** is also like list of references list. The similarity between bibliography and list of references is that both appear at the end of the book weather report, both include similar information, both include alphabetically arranged citations .And the difference between the two is that bibliography includes citations not to be mentioned in the text and bibliography is suggested for the reading for background purposes. In bibliography, there is no APS style. Bibliography in the MLA style includes first author, Second title of source ,Other contributors , Version, Number, Publisher ,Publication date.

**18. Glossary-** A **glossary**, also known as a **vocabulary** is an alphabetical list of terms in a particular domain of knowledge with the definitions for those terms. Traditionally, a **glossary** appears at the end of a **report** and includes terms within that **report** that are either newly introduced, uncommon, or specialized.

**19. Index** An **index** is an alphabetical list of keywords contained in the text of a book or other lengthy **writing** project. It includes pointers to where those keywords or concepts are mentioned in the book—typically page numbers, but sometimes footnote numbers, chapters, or sections.

## **References**

Different Stages of Writing Process :Education Help Apr 1, 2016

Quora:Gray Wilton, PhD In Cogitation, University of Life

Major Elements of Refrigeration System and their Functions By admin | December 17, 2014

Video by NPTEL on Report Writing

