

ENVIRONMENT & ENERGY. 18 march 2025

Syllabus

★ → Most important.

- 1) Basics of environment
- 2) Biodiversity
- ★ 3) Environmental pollution & Environmental Degradation
- ★ 4) climate change and Global warming
- ★ 5) Ozone and ozone hole
- 6) International Environmental conferences
- 7) International Env. Treaties, conventions & protocols
- 8) Environmental Impact Assessment (EIA)
- ★ 9) Energy / Green Energy

Source

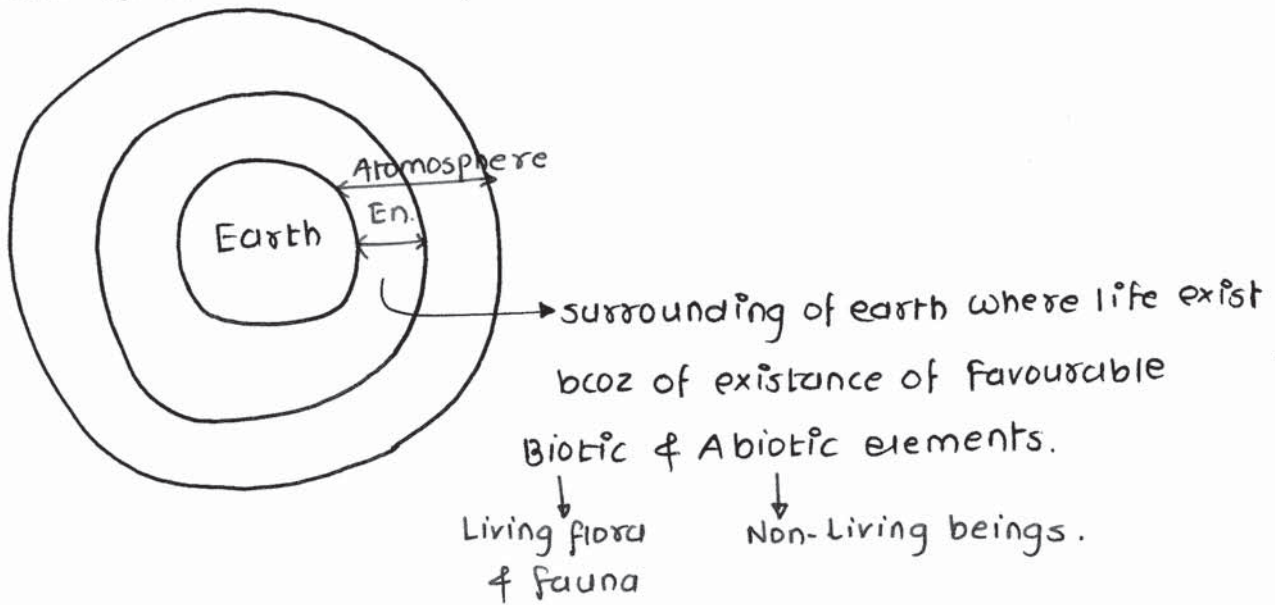
- 1) class Notes
- 2) printed Notes 
 - Green Energy
 - national parks

It's me Vidhyacharan.

NOTES: Vid 3.58

Basics of Environment.

What is environment ?



Types of Environment.



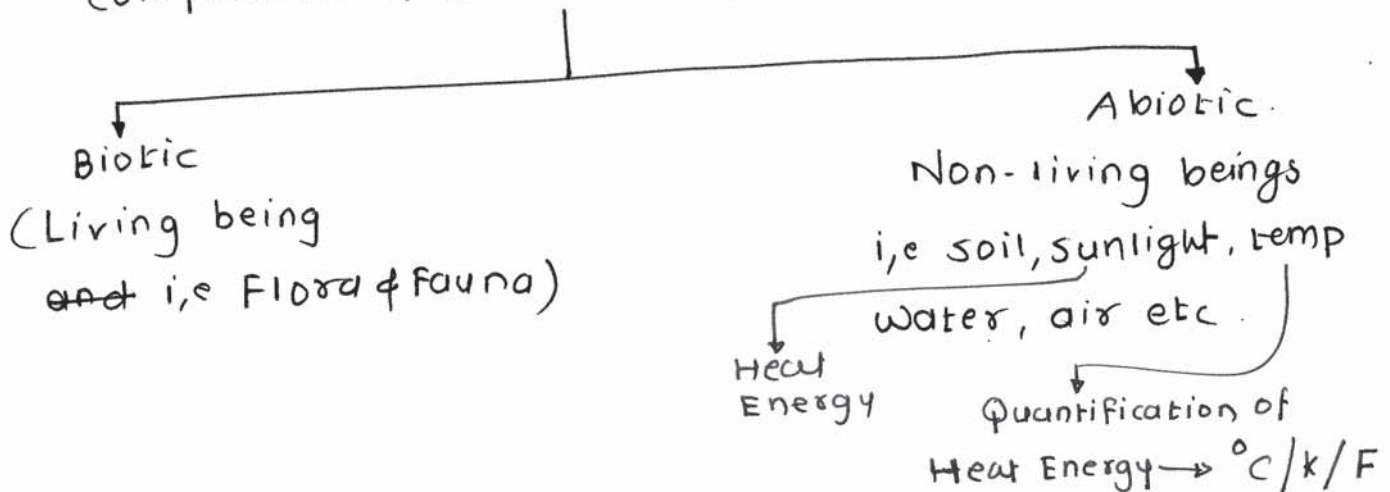
when flora and fauna are allow to grow in their natural form without any human interfeernance then Env. is known as Natural Env.

Ex. Forest Grassland Desert.
ocean

when flora & fauna are allow to grow in designed form to serve the interest of Human being (to improve Aesthetic feeling) the it is known as Artificial Env.

Ex. zoo, Garden, Aquarium.

components of Environment



ENGG DRAWING

CH - 1. Introduction.

2. Scales.

3. conic section.

4. ENGG. CURVES.

5. THEORY OF PROJECTION.

6. PROJECTION OF POINTS.

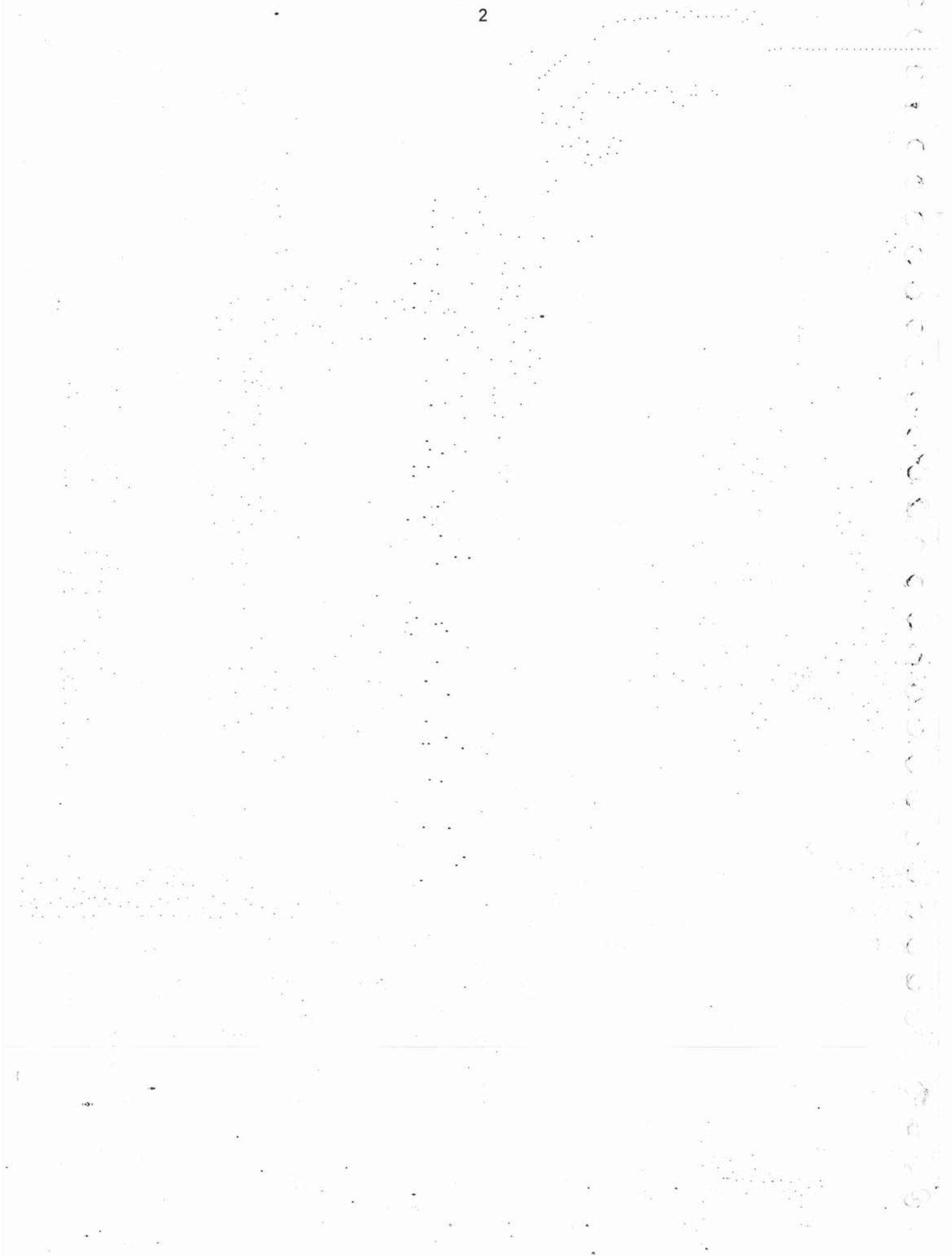
7. PROJECTION OF LINES.

8. PROJECTION OF PLANES.

9. PROJECTION OF SOLIDS.

10. SECTION OF SOLIDS.

11. DEVELOPEMENT OF SURFACES.



Introduction

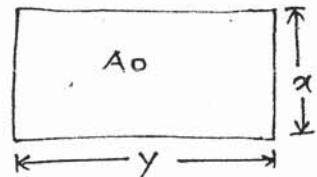
1. > Drawing sheet [IS ~~10711~~ 10711:2001]

• Iso A series sheet : $A_0 > A_1 > A_2 > A_3 > A_4$

* A₀ sheet:

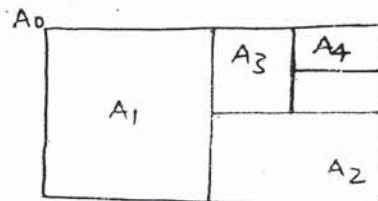
• condⁿ:

$$\left. \begin{array}{l} x:y = 1:\sqrt{2} \\ x \cdot y = 1 \text{ m}^2 \end{array} \right\} \begin{array}{l} x = 841 \text{ mm} \\ y = 1189 \text{ mm} \end{array}$$



→ Successive sheet size is obtained from previous sheet, by taking half of the longest side and maintaining the ratio $1:\sqrt{2}$

Sheet size	x	y	x:y	xy (m ²)	→ $\frac{1}{2^n}$; n=0,1,2,3
A ₀	841	1189	$1:\sqrt{2}$	1	
A ₁	594	841	$1:\sqrt{2}$	$\frac{1}{2}$	
A ₂	420	594	$1:\sqrt{2}$	$\frac{1}{4}$	
A ₃	297	420	$1:\sqrt{2}$	$\frac{1}{8}$	
A ₄	210	297	$1:\sqrt{2}$	$\frac{1}{16}$	



NOTE: All the scanner, printer, photocopy m/c is designed around the ratio $1:\sqrt{2}$. Hence to maintain uniformity, the same ratio is taken for the drawing sheet.

2 > Lines [IS 10714:2001]

* TYPES OF LINES

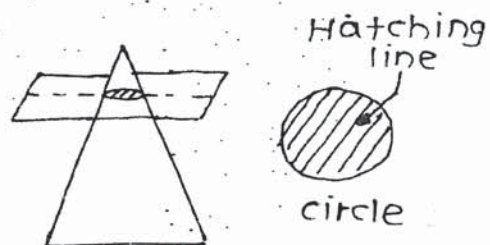
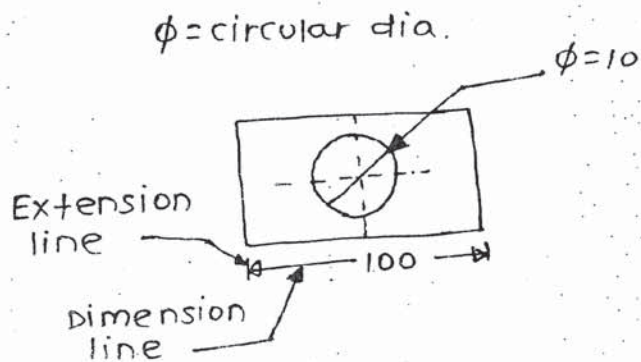
(i) continuous Narrow line

Ex - dimension line

Extension line

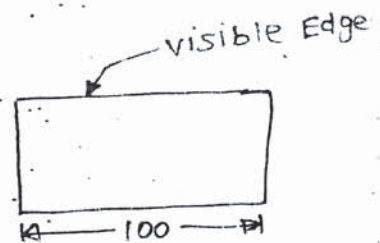
leader line (→)

Hatching (or) sectioning line.



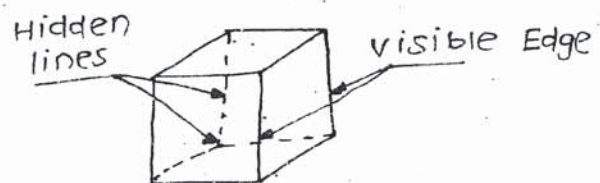
(ii) continuous wide line:

Ex: visible outline / visible Edge



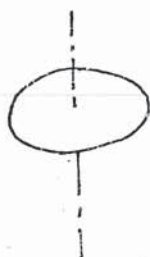
(iii) dashed narrow line:

Ex: Hidden line.

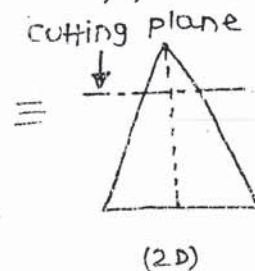
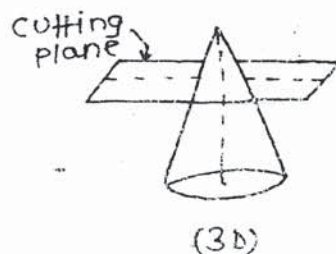


(iv) LONG dash dotted narrow line:

Ex: centre line, Line of symmetry, cutting plane.



Line of symmetry



INFORMATION & COMMUNICATION TECH (ICT)

→ Application of ICT Tools in the field of
e-governance, e-education and Networking.

- ICT → INFORMATION & COMMUNICATION TECH.

↓
Mobile communication -(5)

* ICT syllabus (10-11 ques.) } • current Affairs.
1. ICT Tools → (1-2) → (100%) } ↳ (15-20 ques.)

1. ICT Tools $\rightarrow (1-2) \rightarrow (100\%) \} \rightarrow (15-20)$
2. Networking *** $\rightarrow (4-5) \rightarrow (50\%)$
3. e-Governance $\rightarrow (2-3) \rightarrow \text{Easy } (100\% \text{ Prob.})$
4. e-Education $\rightarrow (1-2) \rightarrow (100\%)$
5. communication $\rightarrow (1) \rightarrow (100\%)$

* e-Governance : →

- (i) What is e-Governance.
- (ii) objective. / Advantages - Disadvantages.
- (iii) National e-Governance programme. (NeGP)
- (iv) NeGP 1.0/2.0
- (v) Digital India programme.
- (vi) e-Gov related programme/policy.

* What is e-Governance.

→ Governance:

• Processes taken by the government that brings max^m welfare for the max^m No. of people.

→ e-Governance means electronic form of governance.

→ In e-Governance, Governance is based on electronic platform such as internet, mobile communication, Telephone.

→ e-Governance was started in India in year 2000 with the launch of IT-Act. (Information technology Act.)

→ With this Act, A ministry MoICT was established. (MoICT → Ministry of Information and communication technology).

→ Later on, MoICT was changed into MeITY (Ministry of electronic & Information Technology), in 2014.

* IT Act -2000:

→ Any agreement on electronic / digital media is recognised in the court of law in India.

• conclusion:

→ It was a weak law. It did not talk about e-commerce, social media etc.

• → In 2008, section 66(A) was added in IT Act, 2000.

→ In year 2017, supreme court abolished (A) of section 66 on the basis of violation of Fundamental right i.e Right to Freedom of speech and expression.

* Data privacy and Data protection Bill :

1. Dr. Srikrishna committee recommendation:

(i) Data localisation :

: Data has to be maintained in local data centre within the boundary of India. So the IT Act can be applied on them.

(ii) An institution will be formed by the govt to monitor any unwanted / threat data & such type of data can be removed from the data centre only.

NOTE: SC did not allow it on the basis that it is in violation of fundamental right of 'Right to privacy'.

(iii) Data ~~over~~ ownership :

→ Data ownership lies with the creator of data.

NOTE: ~~From~~ From these recommendation (i) & (ii) has been adopted by the govt. and it is extended to OTT platform also.

over the ~~top~~ top.

Later on it was extended to the content not suitable for children that may be related to pornographic content or violan then it must be made restricted for children below 18 years of age. Also, the website will make sure that if any such content is available then the viewer is above the 18 years of age.

→ under IT Act, doxing has also been addressed. Doxing means hacking another person identity and posting content through this identity.

→ Doxing also means tracking other persons activity on internet and social media.

→ The process of removing, identifying and correcting any doxing activity or any other defect in computer is called as debugging.

→ The digital content is also made valid in a court of law as ~~app~~ a proof in india.

never
completely
achievable

Long term Goal

objectives of e-Governance:

- (i) e-Gov objective is to bring empowerment for the people through information.
- (ii) people should participate in governance. (People's participation).
- (iii) e-Gov. brings responsibility and accountability, making the government responsible.
- ~~(iv)~~ e-Gov. makes people and govt. interaction easy and more frequent. Therefore, it brings responsibility & accountability in governance.
- (iv) To reduce cost and time delay of a project.
It can be reduced by using ICT Tools for communication.
- (v) It brings transparency.

EX (a) RTI Act. (Right to information Act), 2005.

(b) mygov.in : website or App to communicate with the govt. directly. It is possible to connect with prime minister's 'man ki Bat' programme through this.

(c) opendata.gov.in : All data collected by the govt. are made available on this platform and it is possible to access these data free of cost at any time.

NOTE: A transparent governance is a part of good governance because transparency bring trust between the govt. and the citizen.

Basic of material science #.

- Introduction and atomic bonding (EC+EE)
- crystallography (EC+EE)
- Electric properties of materials — { conductor } EC+EE
- Magnetic properties of materials (EC+EE) — { Insulator }
- Mechanical properties of materials (video) — { semiconductor }
- ceramics (EC+EE).
- polymers
- composites (video)
- phase diagram and alloys.

source

- ① class notes
- ② Theory book.

Telegram

anunad22

Material science

- material science involves investigating the relationship betⁿ the structure and properties of material.
- material sc. does not deal with study of strength and stiffness (or other properties) behaviour of Engg component such as buildings machines, automobile etc, rather it deals with the study of strength & stiffness behaviour (or other properties) of the materials with which these engg component has been design.

Material :- material can be defined as something that consist of matter (occupy some space and has some mass). It is the stuff by which something can be made.

→ Engg materials can be broadly classified as

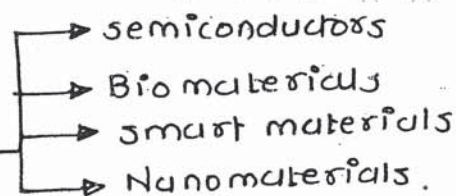
① Metals and alloys.

② Ceramics

③ polymers

④ Composite

⑤ Advanced materials



Structure

structure of a material usually refers to the arrangement of it's internal components

① subatomic structure ② Atomic structure

③ Nanostructure ④ microstructure → The structure which can be observed with the help of optical microscope.

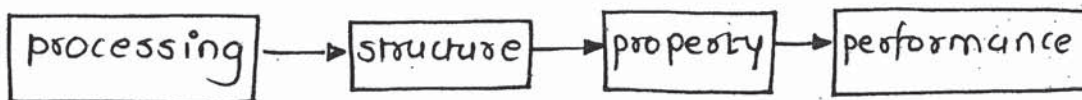
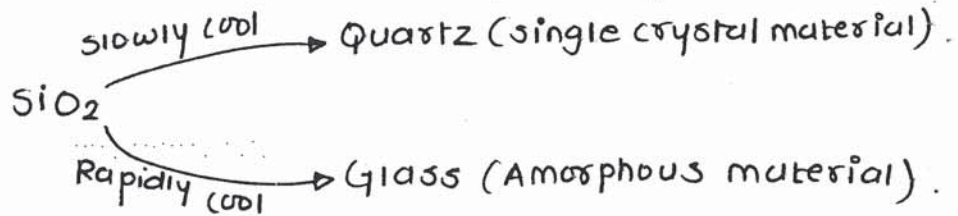
⑤ Macrostructure → The structure which can be observed with naked eyes.

properties of materials.

a property is a material trait in terms of the kind and magnitude of response to a specific imposed stimulus (excitation)

Generally, defⁿ of prop. are made independent of material shape and size.

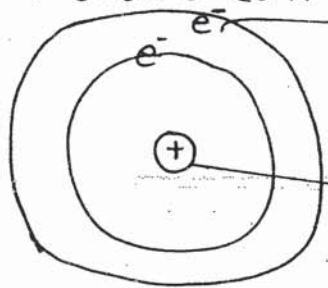
mechanical property, Electrical property, magnetic property
Optical property, Thermal property, Deteriorative property



Atomic Bonding :-

$\rightarrow$ matter is made of some tiny indivisible structures known as "atom".

$\rightarrow$ atoms can neither be created nor destroyed



$e^- \rightarrow$ Negatively charged particle.

$$\text{charge} = -1.6 \times 10^{-19} \text{ C}$$

$$\text{mass} = 9.1 \times 10^{-31} \text{ kg}$$

Nucleus

it contains protons + neutrons.

positively charged particle

$$\text{charge} = 1.6 \times 10^{-19} \text{ C}$$

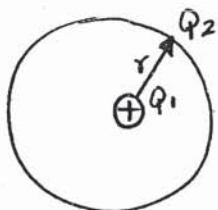
$$\text{mass} = 1.67 \times 10^{-27} \text{ kg}$$

Electrically neutral particle.

$$\text{charge} = 0$$

$$\text{mass} = 1.67 \times 10^{-27} \text{ kg}$$

magnitude of e^- charge $q = 1.6 \times 10^{-19} \text{ C}$.



$$F = \frac{1}{4\pi\epsilon_0} \frac{Q_1 Q_2}{r^2}$$

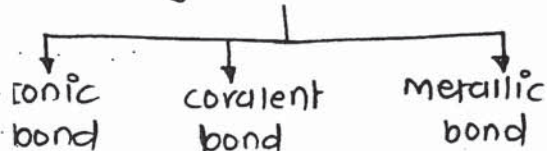
$\rightarrow$ Electrostatic force (Coulombic force).

chemical bond :- The binding force betⁿ atoms or molecule is known as chemical bond.

chemical Bond.

primary bond.

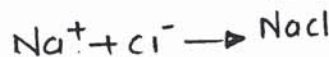
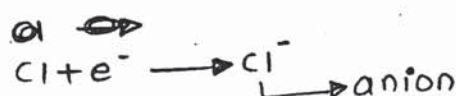
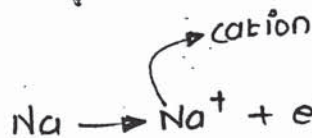
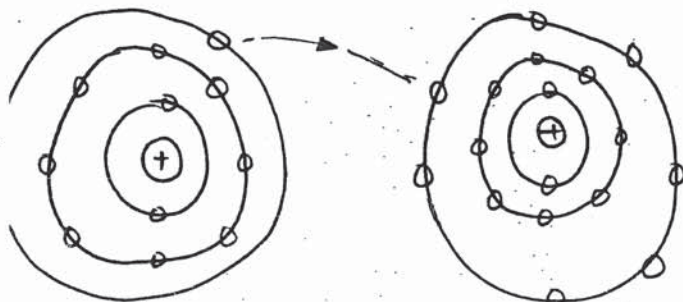
- Interatomic bond
- Electrostatic force
- Strong and stable



Ionic Bond :-

Na → 11 2, 8, 1

Cl → 17 2, 8, 7



Ionic bond is the electrostatic force betⁿ cation and anion

- Ionic bonds are non-directional bonds i.e. the magnitude of bond is equal in all dirⁿ around an ion. It follows that
- for ionic materials to be stable all the ions must have as nearest neighbour -vely charged ion in a 3-D scheme and vice versa.
- Ionic bonds are generally formed betⁿ metallic and non metallic elements. metallic elements have tendency to easily give up their outer orbit e⁻ so these form cations.
- Non metallic elements have tendency to take e⁻ so these forms anions. so ionic bond is basically the coulombic force betⁿ the cation and anion hence the it is the strongest bond among all primary bonds
- cations are smaller than anions.

Secondary bond

- Intermolecular bond.
- Wanderswaal's force.
- weak and unstable

PROJECT MANAGEMENT

Gunjan chaudhary

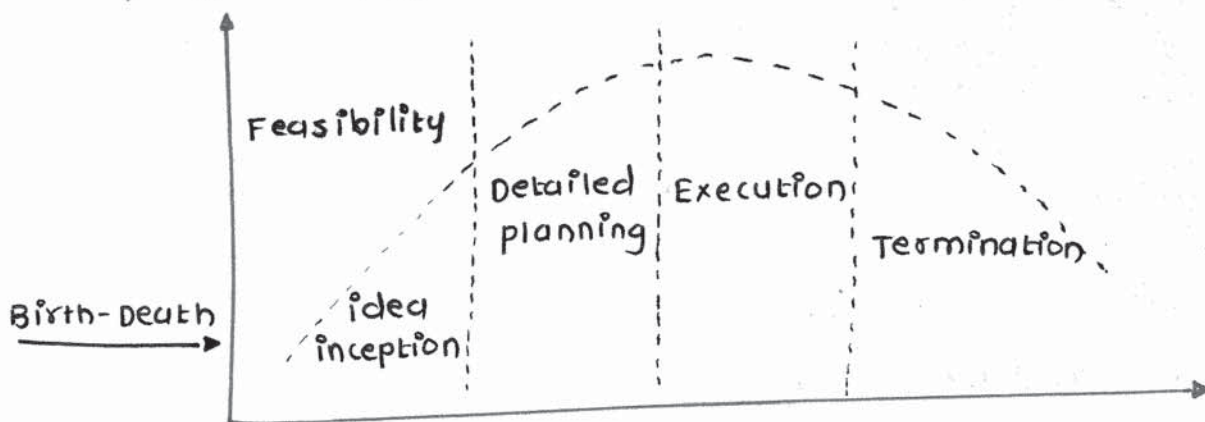
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Introduction :-

project → unique and temporary endeavour to get a product service or any other result.

operation → • continuous
• cycle
• permanent.

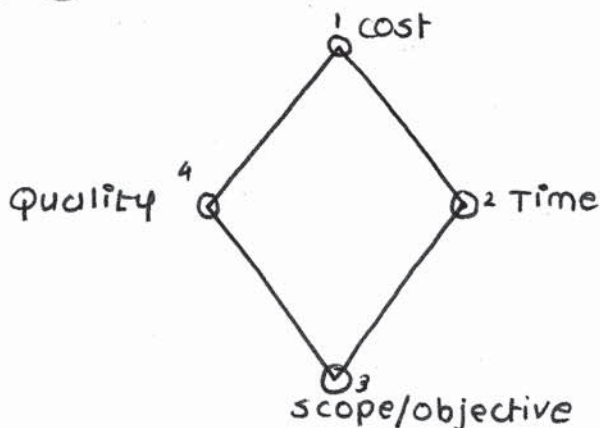
project cycle.



phases of a project :-

- 1) Feasibility → identification
- 2) planning → Formulation
- 3) Execution → Max effort → Appraisal
- 4) Termination → Min effort → Implementation

* Diamond constraint :-



3.1- Healthy - zero maida, No sugar

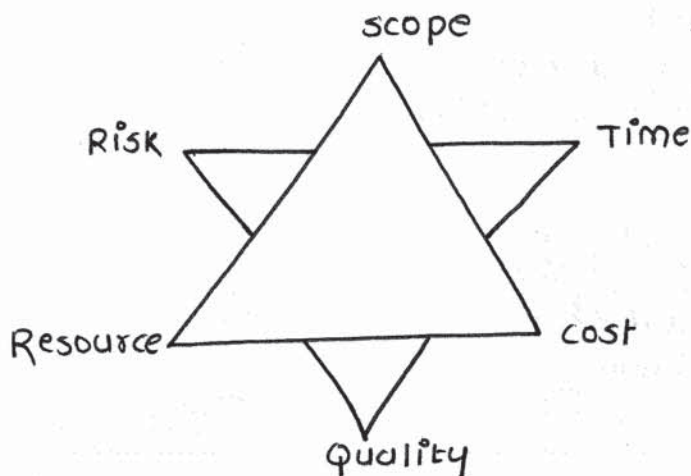
3.2- Green salads, sprouts

3.3- coaching Institutes

* condition :- only 2 constraints can be controlled

Time	Quality	Cost
Quick	Top	High
Time ↑	Top	cheap
Quick	Low	cheap

* Star constraint.



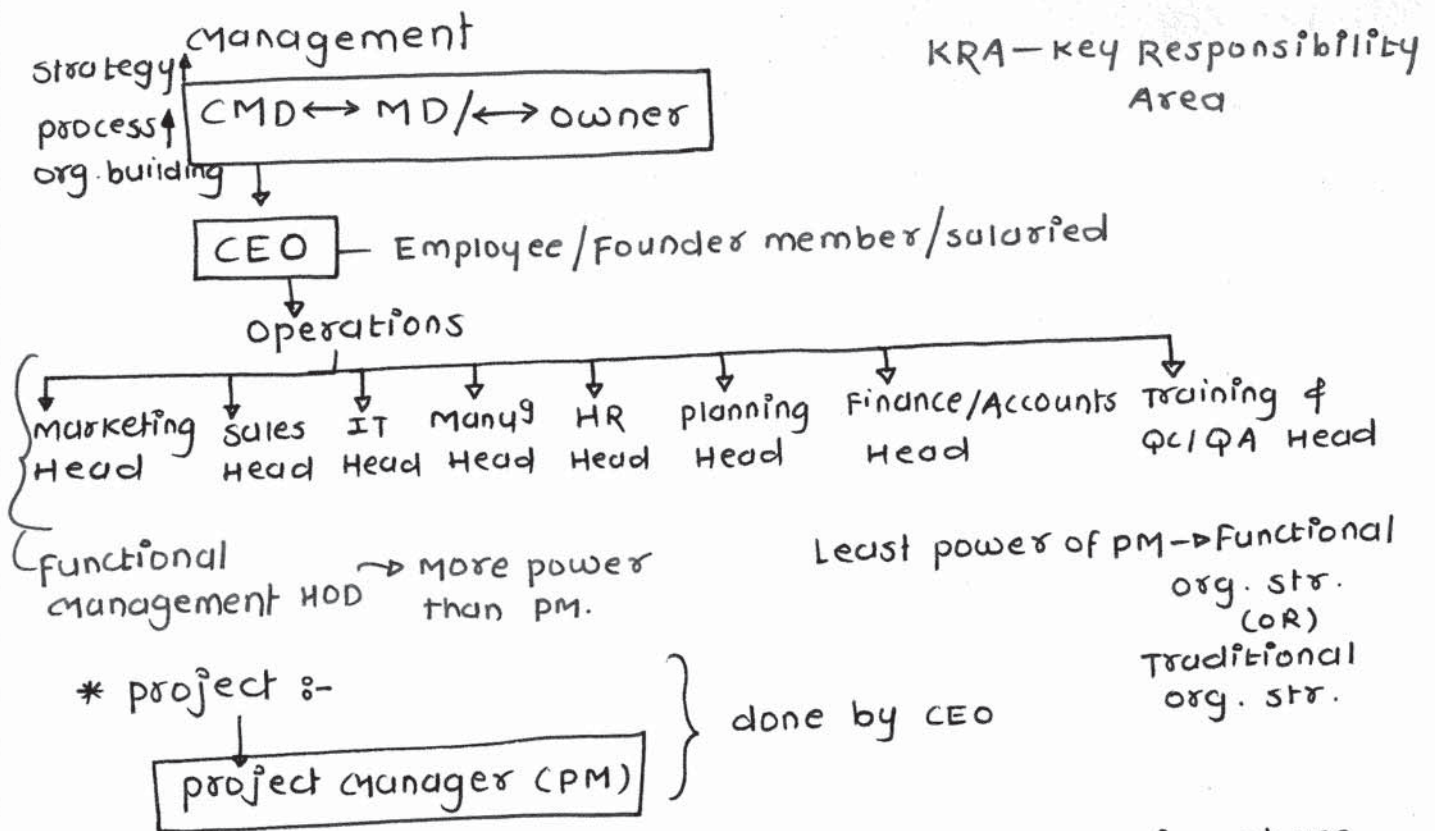
Risk :- outdated with Time

- competitor → Boot strap business → investor - founder himself or herself.
↳ can't run for long time.
- Loss (Fund pool)
↳ Buffer → Angel Investor (venture capitalist)
↳ investment in growing ↳ investment in profit (Mega)
↓
Group of investors.
- company's evaluation decided by first investor

* Resources

- Manpower
- Material
- Machine
- Money
- Tech
- Data

project organization.



PM is hired before entering into project planning phase.
project charter :- official document that authorizes p/m to use all the resources of the company to execute the project.

- * if there is not project charter - No p/m is hired.
- * in a project HODs are more powerful than PM.
- * Duplication is allowed, resource sharing not allowed.
- This structure is functional organization structure (FOS) and is generally for small companies that work for small territory.
- The owner of the company involves day in and day out activities.
- functional managers do not take responsibilities of project completion.

→ Moreover project managers do not have complete authority of driving the manpower of as per the project.

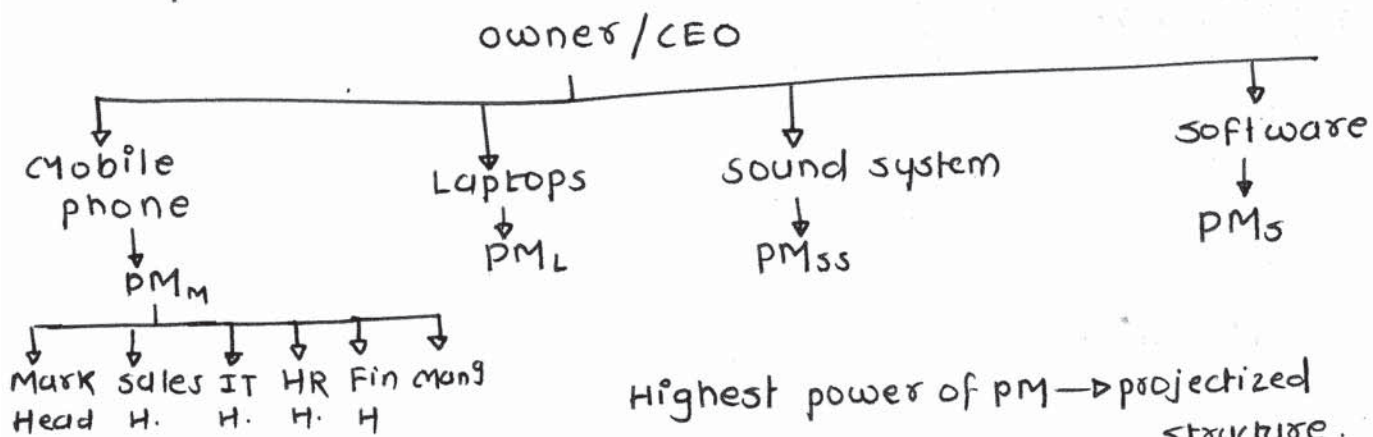
→ Since the owner holds maximum power and authorities, the responsibility of project failure will be only on the owners shoulders.

→ NPA (non performing asset) are difficult to identify.

→ project manager has limited power

→ customer addressal is poor.

* projectized org. str.

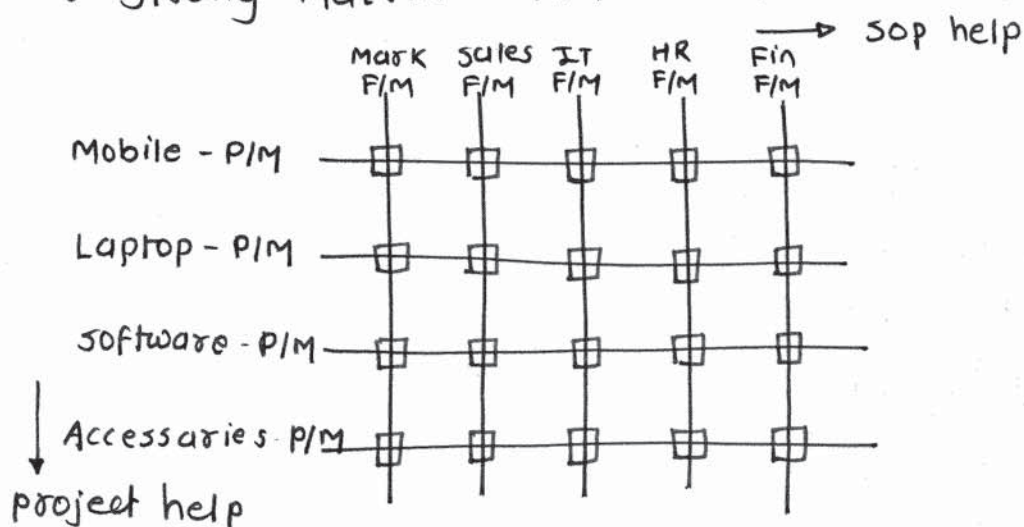


* Matrix org. structure.

• weak matrix

• Balanced matrix

• strong matrix → P/M most power among these three.



It's me Vid358

Date 2-5-2025

Standard and Quality

- Maintenance
- Sampling
- Quality
- Quality control control
- process capability
- TQM
- Six sigma
- Quality in service sector.
- ISO
- LPP
- Inventory
- Line balancing

* Maintenance *

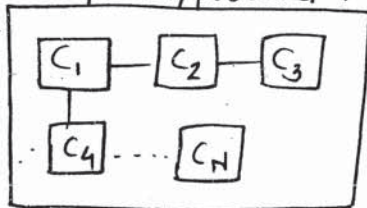
Reliability :- The reliability of product or system can be defined as the probability that the product will perform its require function under the specific condition for the certain period of time.

$$R = \text{function (time)}$$

$$R = f(t)$$

$t=0 \rightarrow R = 100\%$
system/product

$$t \uparrow = R \downarrow$$

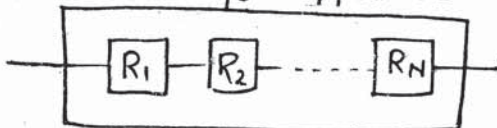


C = component

Reliability of system will depend on Reliability of individual component.

For series connection

system/product



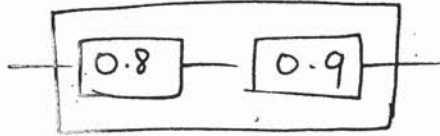
$$R_s = R_1 \times R_2 \times \dots \times R_N$$

R_s = Reliability of system

R_1 = Reliability of component ①

R_2 = Reliability ②

Assume that a product has two component both of which must work for the product to "fun". comp. ① has reliability of 80% and comp ② has reliability of 90% - compute the reliability of the system.



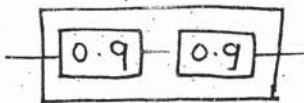
$$\begin{aligned}
 R_s &= R_1 \times R_2 \\
 &= 0.8 \times 0.9 \\
 &= 0.72 \\
 &= 72\%
 \end{aligned}$$

S-1 The reliability of the system is always less than or equal to the reliability of individual component when they are connected in series.

$$R_s \leq \{R_1, R_2, \dots, R_N\}$$

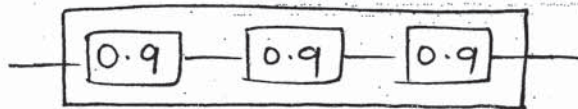
Ex. compute the Reliability of the system.

system-1



$$\begin{aligned}
 R_s &= R_1 \times R_2 \\
 &= 0.9 \times 0.9 \\
 &= 0.81 = 81\%
 \end{aligned}$$

system-2



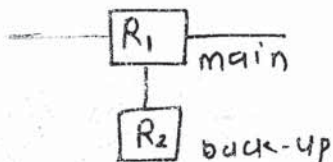
$$\begin{aligned}
 R_s &= 0.9 \times 0.9 \times 0.9 \\
 &= 0.729 = 72.9\%
 \end{aligned}$$

S-2 As the number of component in the series increases the reliability of system decreases.

How to increase the reliability of system. ?

by providing backup to the critical component.

* parallel connection.



$$R_s = R_1 + R_2(1 - R_1)$$

$$R_s = R_1 + R_2 - R_1 R_2$$

Two power generators provide electricity to a facility, i.e. main & backup generator. The main Gen. has reliability of 0.95 and backup has reliability of 0.90. Compute the Reliability of system.

$$R_s = R_1 + R_2(1 - R_1) = 0.95 + 0.90(1 - 0.95)$$

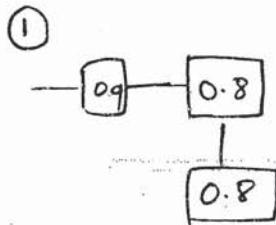
$$R_s = 0.995$$

$$99.5$$

S-3 : The Reliability of the system is always greater than the Reliability of individual component when they are connected in parallel connection.

S-4 As the no. of component in backup (parallel) increases the reliability of the system is Increase.

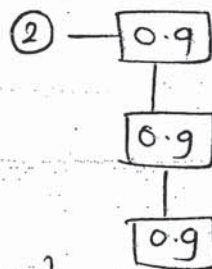
compute the Reliability of system.



$$\textcircled{1} R_s = R_1 \times \{R_2 + R_3(1 - R_2)\}$$

$$0.9 \times \{0.8 + 0.8(1 - 0.8)\}$$

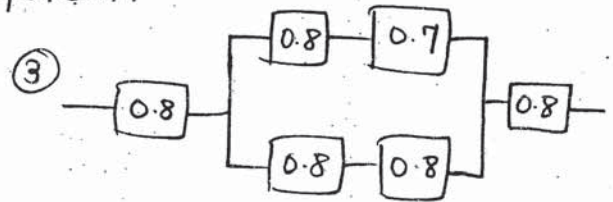
$$R_s = 0.864$$



$$\textcircled{2} R_s = R_1 + R_2(1 - R_1) + R_3(1 - R_1)(1 - R_2)$$

$$= 0.9 + 0.9(1 - 0.9) + 0.9(1 - 0.9)(1 - 0.9)$$

$$R_s = 99.9$$



③

```

graph LR
    A[0.8] --- B
    B --- C[0.64]
    B --- D[0.56]
    C --- E[0.56]
    D --- E
    E --- F[0.8]
  
```

$$R_s = 0.8 \times \{0.64 + 0.56(1 - 0.64)\} \times 0.8$$

$$= 53.86 \%$$

* Reliability prediction using exponential distribution.

It is one of the most commonly used distribution in the reliability prediction and it used to predict the probability of survival to a particular time.

$$R(t) = e^{-\lambda t}$$

$$\text{at } t=0 \quad R=100$$

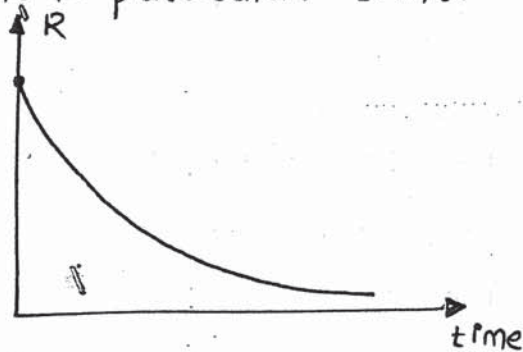
$$t \uparrow \quad R \downarrow$$

$$R(t) = e^{-\lambda t}$$

R = Reliability

t = time

λ = failure rate.



Exponential Distribution. Failure rate remain constant w.r.t time.
Weibull Distribution. Failure rate increases/decreases w.r.t time.

For λ .

- ① MTTF $\rightarrow$ Mean Time to failure
- ② MTBF $\rightarrow$ Mean Time ~~to~~ Between failure
- ③ MTTR $\rightarrow$ Mean Time to Repair.

① MTTF

$\rightarrow$ it is referred as average time an item may be expected to function before the failure.

$\rightarrow$ it used for non-repairable item

Eg. Bulb $\rightarrow$ 4 { $\begin{matrix} \rightarrow 3000 \\ \rightarrow 4000 \\ \rightarrow 4000 \\ \rightarrow 5000 \end{matrix}$ }
$$MTTF = \frac{3000+4000+4000+5000}{4}$$

② MTBF

$$MTTF = 4000 \text{ hr}$$

$\rightarrow$ it refers to time between two failures.

$\rightarrow$ it used for repairable items

$$MTBF = \frac{\text{Total Device hour}}{\text{no. of repair}}$$

ETHICS

Ethics101 Telegram.

24 March 2025...

9810123649

K.M. PATHI

Literal meaning of ethics.

The word ethics come from Greek word, ethika meaning character or custom.

The word moral comes from Latin mores meaning custom.

Ethics

Morals

- | | |
|---|---|
| → Refers to professional conduct values and principles. | → Refers to <u>personal behaviour</u> |
| → conveys sense of <u>stability</u> <u>permanence</u> | → may <u>change</u> as acceptable social behavior |
| → An <u>ideal</u> standard of behaviour | → customs practiced in any given <u>community</u> or <u>culture</u> . |

What is ethics ?

* a body of prescriptions & prohibitions, do's & don't's .
(Jonsen & Hellegers)

* Ethics may be styled as the art of self government .
(regulation)" (Bentham)

* The standard of conduct derived from the philosophical and religious traditions of society" (means)

* ethics is concerned about what is right, fair, just or good about what we ~~do~~ ought to do. (preston)

contextual
situational

Ethics refers to . .

- Branch of philosophy which seeks to address concept of right and wrong.
- Branch of philosophy that is concerned with human conduct.
- - - - -> Behavioral personal social citizen
- Examination of the our moral judgements.
- an attempt to help human is leading good life by applying moral principles.

Sources of Ethics .

- God and Religion
- Human conscience .
- The example of good human beings (role models)
- political power (Laws made by state / Govt)
- professionals Associations (NSPE etc)

Ethics

→ Ethics developed gradually from people's awareness.

→ Ethics are guidelines for good life

Law .

→ Laws are written and enforced by govt / state.

→ Laws are guidelines for public conduct.

Religion VS Ethics .

Religion is a source of morality of followers

Religion = followers

Ethics = secular

Ethics

→ central aspect of ethics is the rules of living

→ Ethics is grounded in reason (critical thinking) and human experience

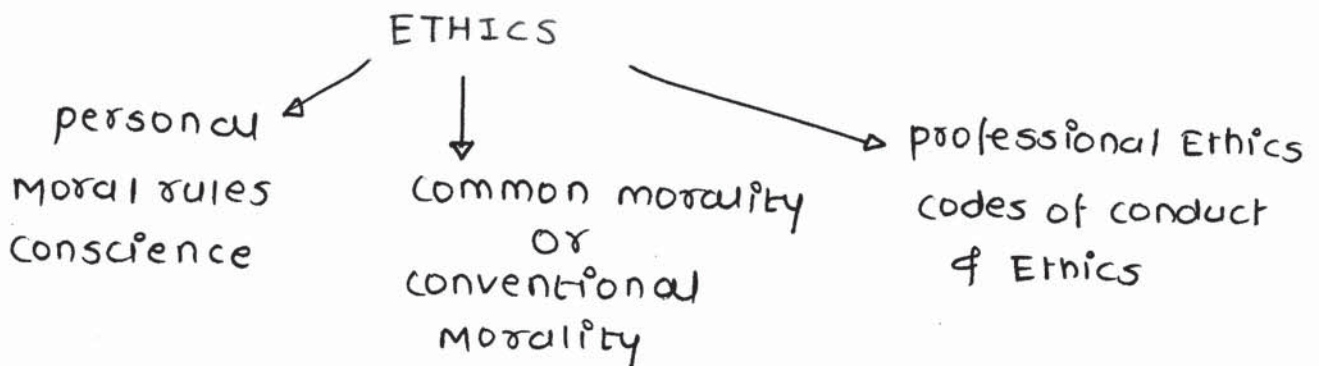
→ critical thinking

Religion

→ Following God's commands or religious rules is the central aspect.

→ Religion is grounded in revelation or divine authority

→ Faith



personal morals.

- help your family
- help your group
- return favours
- be upright
- defer to superiors
- divide resources fairly
- respect others' property

customary / conventional morality

- Norms/customs that are passed on from one generation to another (ostracism)
- widowhood norms purity pollution norms.

professional Ethics.

- professional ethics is the set of standards adopted by professionals
- focuses on issues that are important for & in that profession
- Regulates professional relationship

- Moral obligations of a professional.

What is a profession?

Features.

- Advanced expertise :- Skills, knowledge, continuous learning.
- self Regulation :- standards of conduct (codes of conduct)
- public good :- serving public good.
- way of making a living
- Enter voluntarily & leave voluntarily.

Being Ethical involves



Being Ethically literate.



Being Ethically competent.

Ethical Literacy.

- comprehending complex ethical issues
- Ability to comprehend the consequences of one's action.

Ethical skills/competencies

- Be knowledgeable of ethical principles
- Recognize and promote constitutional principles of equality fairness etc
- Respect the law, serve the public law
- Respect and protect privileged information (Confidentiality).

↳ Insider Trading.