Engineering Mechanics (K Scheme) - Quick Revision Notes

1. Basic Concepts & Laws

- Force: Push or pull on a body.
- Newton's Laws of Motion:
  1st Law: Law of Inertia.
  2nd Law: F = m * a.
  3rd Law: Action = Reaction.

2. System of Forces

- Resultant Force (R): Single force representing a system.
- Types of Force System: Coplanar Concurrent, Coplanar Non-Concurrent.
- Lami's Theorem: A/sin(alpha) = B/sin(beta) = C/sin(gamma).

3. Moment of Force

- Moment (M) = Force * Perpendicular distance.
- Varignon's Theorem: Moment of a resultant = Sum of moments.

4. Friction

- Types: Static, Dynamic.
- Laws: Friction is proportional to Normal reaction, Independent of area.
- F = mu * N

5. Centre of Gravity & Centroid

- C.G: Point where entire weight acts.
- Centroid: Geometrical center.
- Triangle: 1/3rd from base, Semi-circle: 4r/3(pi) from base.

6. Moment of Inertia (M.I)

- Rectangle (x-axis): Ix = bd^3/12
- Parallel Axis Theorem: I = IG + Ad^2

7. Simple Machines

- MA = Load / Effort
- VR = Distance moved by Effort / Distance moved by Load
- Efficiency = (MA / VR) * 100

8. Equilibrium

- Sum of all horizontal forces = 0
- Sum of all vertical forces = 0
- Sum of all moments = 0

Quick Tips to Score Well:

- Practice Lami's Theorem, Friction, M.I numericals.
- Revise formulas.
- Draw neat Free Body Diagrams.
- Write formulas first, then solve.