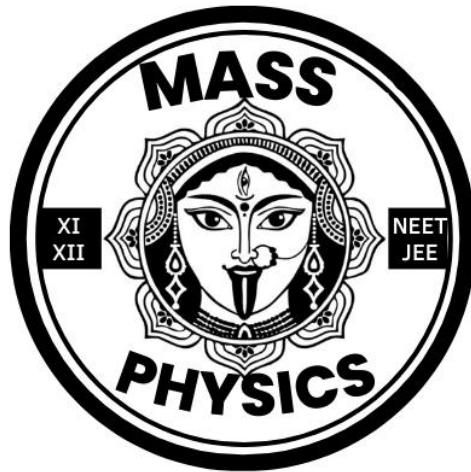




MASS PHYSICS



IMPORTANT TABLES & FORMULA SHEETS CLASS XI





MASS PHYSICS

SOME PHYSICAL CONSTANTS

| S. No. | Quantity | Symbol | Value |
|--------|--|----------------------|--|
| 1. | Universal gravitational constant | G | $6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$ |
| 2. | Acceleration due to gravity on surface of Earth | g | 9.8 m s^{-2} |
| 3. | Polar radius of Earth | R_p | $6.357 \times 10^6 \text{ m}$ |
| 4. | Equatorial radius of Earth | R_e | $6.378 \times 10^6 \text{ m}$ |
| 5. | Mass of Earth | M_e | $5.98 \times 10^{24} \text{ kg}$ |
| 6. | Radius of Moon | R_m | $1.75 \times 10^6 \text{ m}$ |
| 7. | Mass of Moon | M_m | $7.4 \times 10^{22} \text{ kg}$ |
| 8. | Average distance of Moon from Earth | D_{me} | $3.8 \times 10^8 \text{ m}$ |
| 9. | Radius of Sun | R_s | $7.0 \times 10^8 \text{ m}$ |
| 10. | Mass of Sun | M_s | $2.0 \times 10^{30} \text{ kg}$ |
| 11. | Average distance of Earth from Sun | D_{es} | $1.5 \times 10^{11} \text{ m}$ |
| 12. | Boltzmann's constant | k | $1.38 \times 10^{-23} \text{ J K}^{-1}$ |
| 13. | Avogadro's number | N | $6.02 \times 10^{23} \text{ mol}^{-1}$ |
| 14. | Universal gas constant | R | $8.31 \text{ J mol}^{-1} \text{ K}^{-1}$ |
| 15. | Stefan's constant | c | $5.67 \times 10^{-8} \text{ W m}^{-2} \text{ K}^{-4}$ |
| 16. | Wein's constant | b | $2.898 \times 10^{-3} \text{ m K}$ |
| 17. | Absolute zero of temperature | 0 K | $-273.15 \text{ }^\circ\text{C}$ |
| 18. | Atmospheric pressure on surface of Earth | P | $1.013 \times 10^5 \text{ N m}^{-2}$ |
| 19. | Molar volume | V | $22.4 \times 10^{-3} \text{ m}^3 \text{ mol}^{-1}$ |
| 20. | Solar constant | S | $1.388 \times 10^3 \text{ W m}^{-2}$ |
| 21. | Speed of light in vacuum | c | $3.0 \times 10^8 \text{ m s}^{-1}$ |
| 22. | Charge on electron | -e | $-1.6 \times 10^{-19} \text{ C}$ |
| 23. | Charge on proton | +e | $+1.6 \times 10^{-19} \text{ C}$ |
| 24. | Atomic mass unit | a.m.u. or u | $1.66 \times 10^{-27} \text{ kg} = 931 \text{ MeV}$ |
| 25. | Rest mass of electron | m_e | $9.11 \times 10^{-31} \text{ kg} = 0.000549 \text{ a.m.u.} = 0.511 \text{ MeV}$ |
| 26. | Rest mass of proton | m_p | $1.672 \times 10^{-27} \text{ kg} = 1.007267 \text{ a.m.u.} = 938.28 \text{ MeV}$ |
| 27. | Rest mass of neutron | m_n | $1.674 \times 10^{-27} \text{ kg} = 1.008665 \text{ a.m.u.} = 939.57 \text{ MeV}$ |
| 28. | Specific charge (charge to mass ratio) of electron | e/m_e | $1.7598 \times 10^{11} \text{ C kg}^{-1}$ |
| 29. | Permittivity of free space | ϵ_0 | $8.854 \times 10^{-12} \text{ C}^2 \text{ N}^{-1} \text{ m}^{-2}$ |
| 30. | Coulomb's constant | $1/4 \pi \epsilon_0$ | $9.0 \times 10^9 \text{ N m}^2 \text{ C}^{-2}$ |
| 31. | Dielectric constant of vacuum | K_{vacuum} | 1 |
| 32. | Dielectric constant of air | K_{air} | 1.005 |
| 33. | Permeability of free space | μ_0 | $4 \pi \times 10^{-7} \text{ T m A}^{-1} = 1.26 \times 10^{-6} \text{ T m A}^{-1}$ |
| 34. | Plank's constant | h | $6.62 \times 10^{-34} \text{ J s}$ |
| 35. | Bohr's radius of hydrogen atom | a_0 | $5.3 \times 10^{-11} \text{ m} = 0.53 \text{ \AA}$ |
| 36. | Rydberg's constant | R_H | $1.09678 \times 10^7 \text{ m}^{-1}$ |
| 37. | Bohr magneton | μ_B | $9.27 \times 10^{-24} \text{ A m}^2$ |
| 38. | Nuclear magneton | μ_N | $5.05 \times 10^{-27} \text{ A m}^2$ |



MASS PHYSICS

USEFUL TABLES

THE GREEK ALPHABET

| Letter | Upper | Lower | Letter | Upper | Lower |
|---------|-----------|------------|---------|----------|------------|
| Alpha | A | α | Nu | N | ν |
| Beta | B | β | Xi | Ξ | ξ |
| Gamma | Γ | γ | Omicron | O | o |
| Delta | Δ | δ | Pi | Π | π |
| Epsilon | E | ϵ | Rho | P | ρ |
| Zeta | Z | ζ | Sigma | Σ | σ |
| Eta | H | η | Tau | T | τ |
| Theta | Θ | θ | Upsilon | Y | υ |
| Iota | I | ι | Phi | Φ | ϕ |
| Kappa | K | κ | Chi | X | χ |
| Lambda | Λ | λ | Psi | Ψ | ψ |
| Mu | M | μ | Omega | Ω | ω |

MULTIPLES AND PREFIXES FOR METRIC UNITS

| Multiple | Prefix | Abbreviation | Pronunciation |
|------------|--------|--------------|---------------|
| 10^{24} | yotta | Y | yot'ta |
| 10^{21} | zetta | Z | zet'ta |
| 10^{18} | exa | E | ex'a |
| 10^{15} | peta | P | pet'a |
| 10^{12} | tera | T | ter'a |
| 10^9 | giga | G | ji'ga |
| 10^6 | mega | M | meg'a |
| 10^3 | kilo | k | kil'o |
| 10^2 | hecto | h | hek'to |
| 10 | deka | da | dek'a |
| 10^{-1} | deci | d | des'i |
| 10^{-2} | centi | c | sen'ti |
| 10^{-3} | milli | m | mil'li |
| 10^{-6} | micro | μ | mi'kro |
| 10^{-9} | nano | n | nan'oh |
| 10^{-12} | pico | p | pe'ko |
| 10^{-15} | femto | f | fem'toe |
| 10^{-18} | atto | a | at'toe |
| 10^{-21} | zepto | z | zep'toe |
| 10^{-24} | yocto | y | yock'toe |

VALUES OF SOME USEFUL NUMBERS

| | |
|---------------------------|-------------------------|
| $\pi = 3.14159\dots\dots$ | $e = 2.71828\dots\dots$ |
| $\sqrt{2} = 1.41421$ | $\sqrt{3} = 1.73205$ |
| $\log_2 = 0.6931$ | $\log_3 = 1.0986$ |

SI BASE UNITS

| S. No. | Physical quantity | Unit | Symbol |
|--------|--------------------|----------|--------|
| 1. | Length | metre | m |
| 2. | Mass | kilogram | kg |
| 3. | Time | second | s |
| 4. | Temperature | kelvin | K |
| 5. | Electric current | ampere | A |
| 6. | Luminous intensity | candela | cd |
| 7. | Quantity of matter | mole | mol |

SI SUPPLEMENTARY UNITS

| S. No. | Physical quantity | Unit | Symbol |
|--------|-------------------|-----------|--------|
| 1. | Plane angle | radian | rad |
| 2. | Solid angle | steradian | sr |

SOME SI DERIVED UNITS

| S. No. | Physical quantity | Unit / Symbol | SI unit |
|--------|---------------------|--|--|
| 1. | Force | newton (N) | kg m s^{-2} |
| 2. | Pressure | pascal (Pa) | $\text{kg m}^{-1} \text{s}^{-2}$ |
| 3. | Energy | joule (J) | $\text{kg m}^2 \text{s}^{-2}$ |
| 4. | Power | watt (W) | $\text{kg m}^2 \text{s}^{-3}$ |
| 5. | Frequency | hertz (Hz) | s^{-1} |
| 6. | Electric charge | coulomb (C) | A s |
| 7. | Electric potential | volt (V) | $\text{kg m}^2 \text{A}^{-1} \text{s}^{-3}$ |
| 8. | Electric field | N C^{-1} or V m^{-1} | $\text{kg m A}^{-1} \text{s}^{-3}$ |
| 9. | Electric flux | maxwell (Mx) | $\text{kg m}^3 \text{A}^{-1} \text{s}^{-3}$ |
| 10. | Electric resistance | ohm (Ω) | $\text{kg m}^2 \text{A}^{-2} \text{s}^{-3}$ |
| 11. | Capacitance | farad (F) | $\text{A}^2 \text{s}^4 \text{kg}^{-1} \text{m}^{-2}$ |
| 12. | Inductance | henry (H) | $\text{kg m}^2 \text{A}^{-2} \text{s}^{-2}$ |
| 13. | Magnetic induction | tesla (T) | $\text{kg A}^{-1} \text{s}^{-2}$ |
| 14. | Magnetic flux | weber (Wb) | $\text{kg m}^2 \text{A}^{-1} \text{s}^{-2}$ |

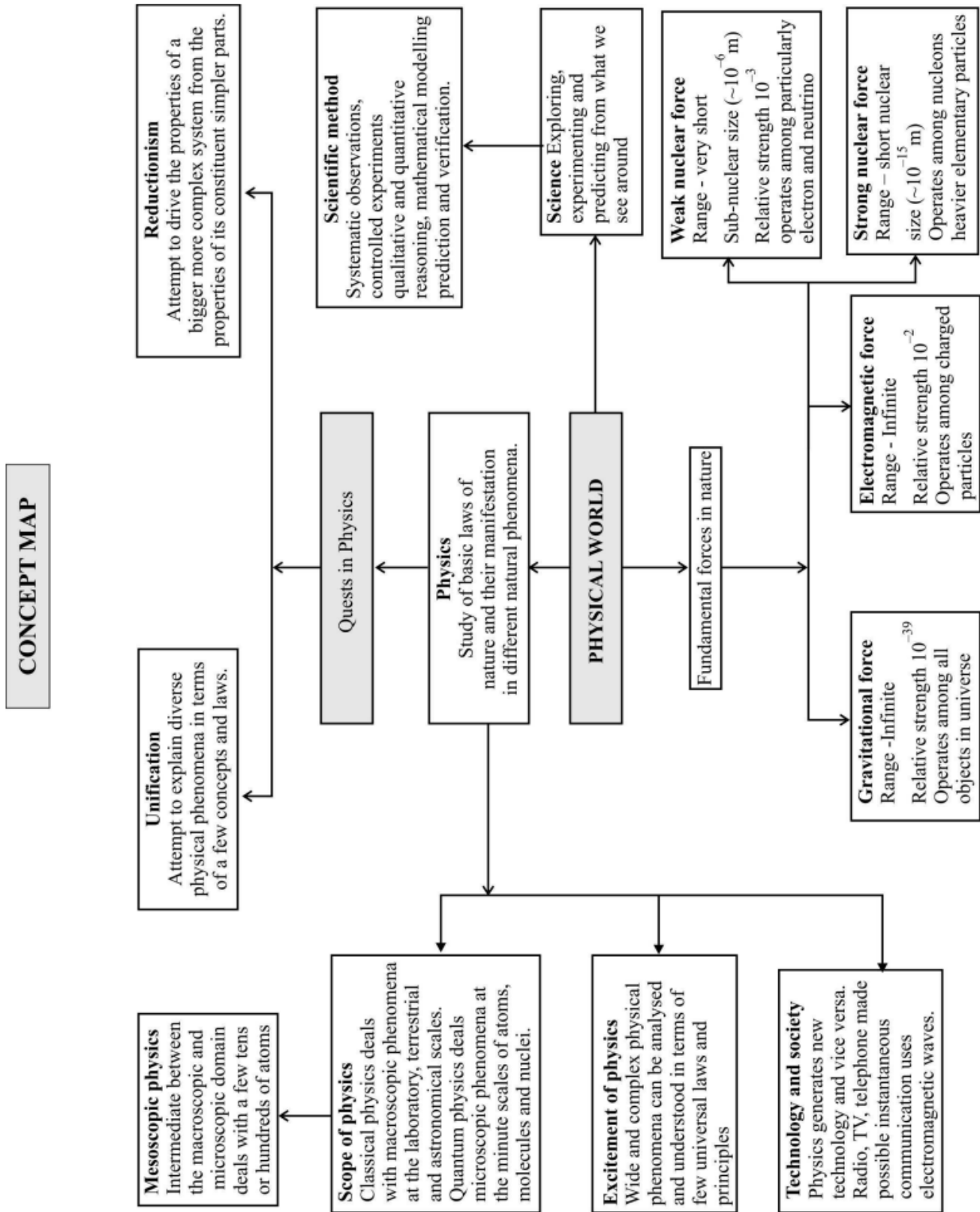
SOME NON-SI UNITS

| S. No. | Physical quantity | Unit / Symbol | Value |
|--------|-------------------|---------------------------|------------------------------------|
| 1. | Length | par sec (pc) | $= 3.08 \times 10^{16} \text{ m}$ |
| 2. | Length | light year (ly) | $= 9.46 \times 10^{15} \text{ m}$ |
| 3. | Length | astronomical unit (AU) | $= 1.496 \times 10^{11} \text{ m}$ |
| 4. | Length | angstrom (\AA) | $= 10^{-10} \text{ m}$ |
| 5. | Length | fermi (f) | $= 10^{-15} \text{ m}$ |
| 6. | Volume | litre (l) | $= 10^{-3} \text{ m}^3$ |
| 7. | Force | kilogram force (kgf) | $= 9.8 \text{ N}$ |
| 8. | Pressure | bar | $= 10^5 \text{ Pa}$ |
| 9. | Energy | calorie | $= 4.186 \text{ J}$ |
| 10. | Energy | kilowatt hour (kWh) | $= 3.6 \times 10^6 \text{ J}$ |
| 11. | Energy | electron volt (eV) | $= 1.6 \times 10^{-19} \text{ J}$ |
| 12. | Power | horse power (h.p.) | $= 745.7 \text{ W}$ |



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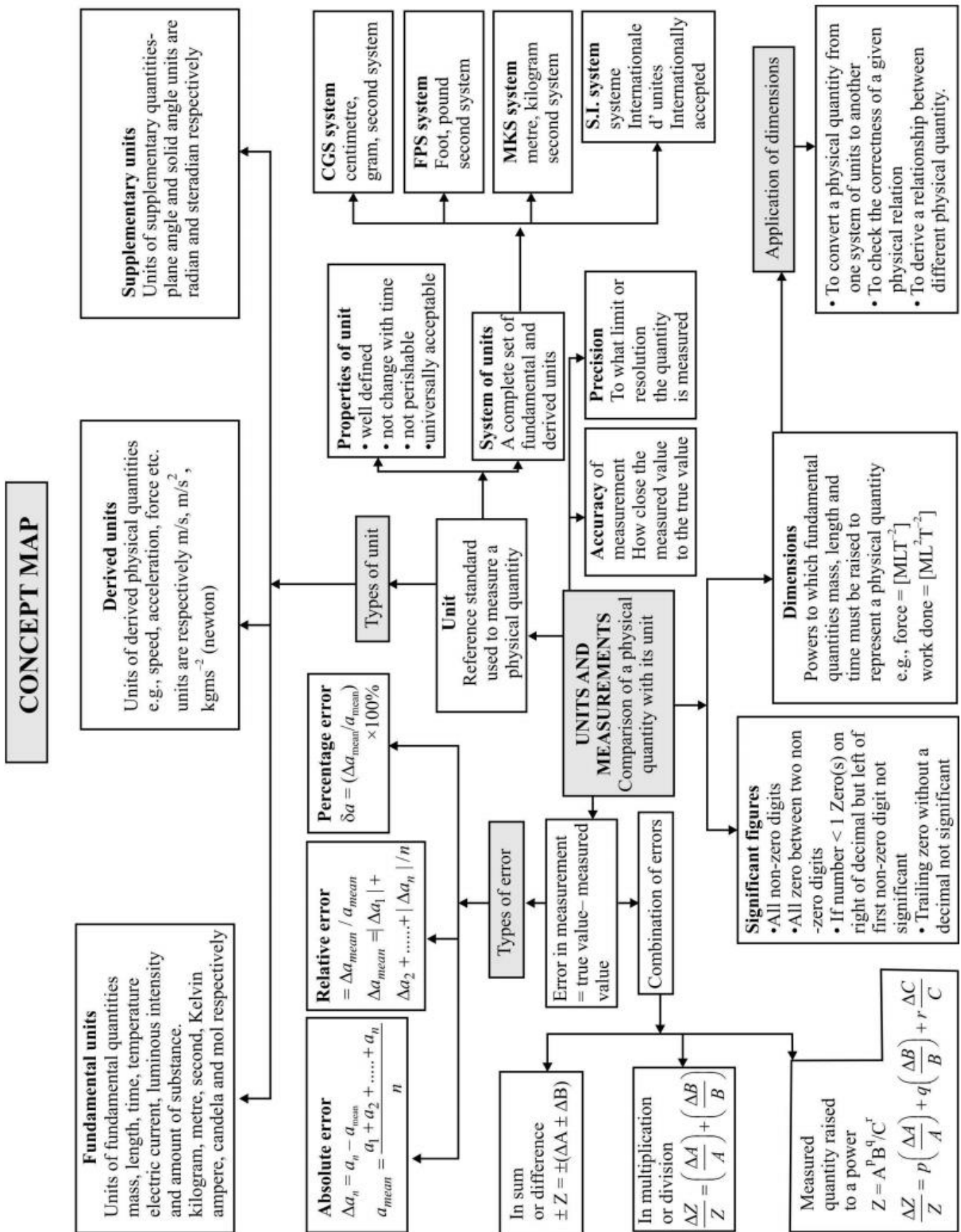
CHAPTER 1 PHYSICAL WORLD





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CHAPTER 2 UNITS & MEASUREMENT

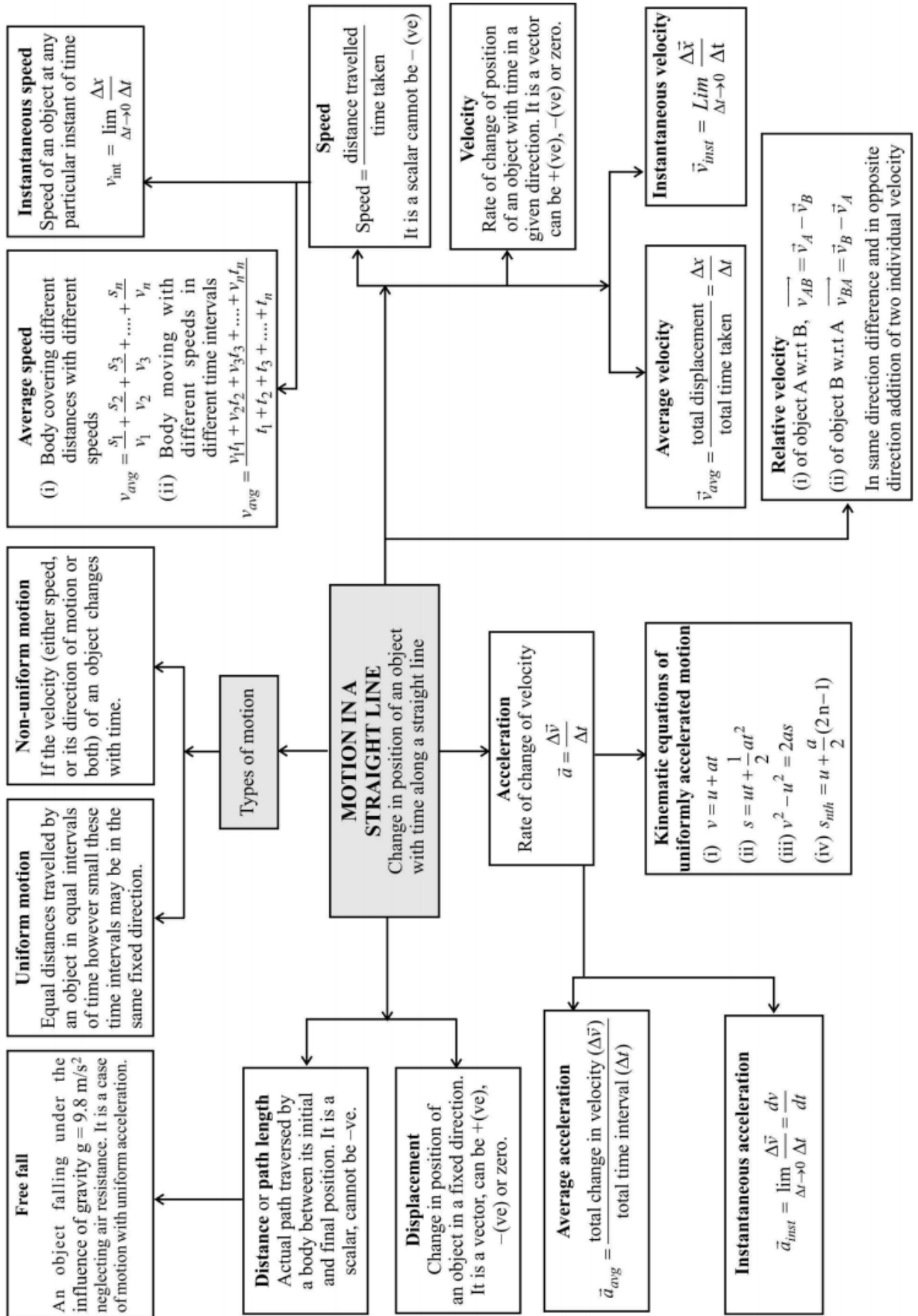




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CHAPTER 3 MOTION IN A STRAIGHT LINE

CONCEPT MAP

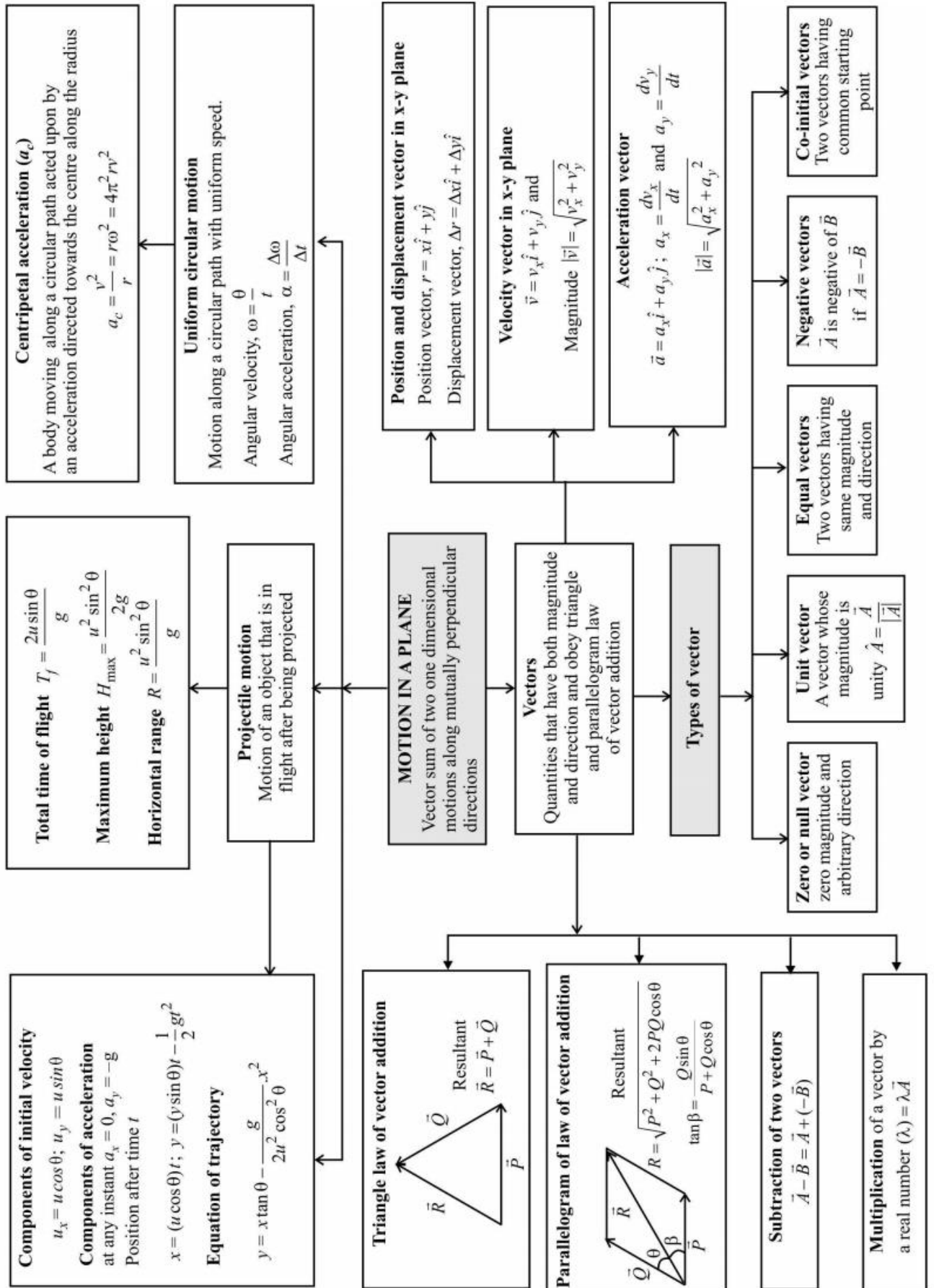




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CHAPTER 4 MOTION IN A PLANE

CONCEPT MAP

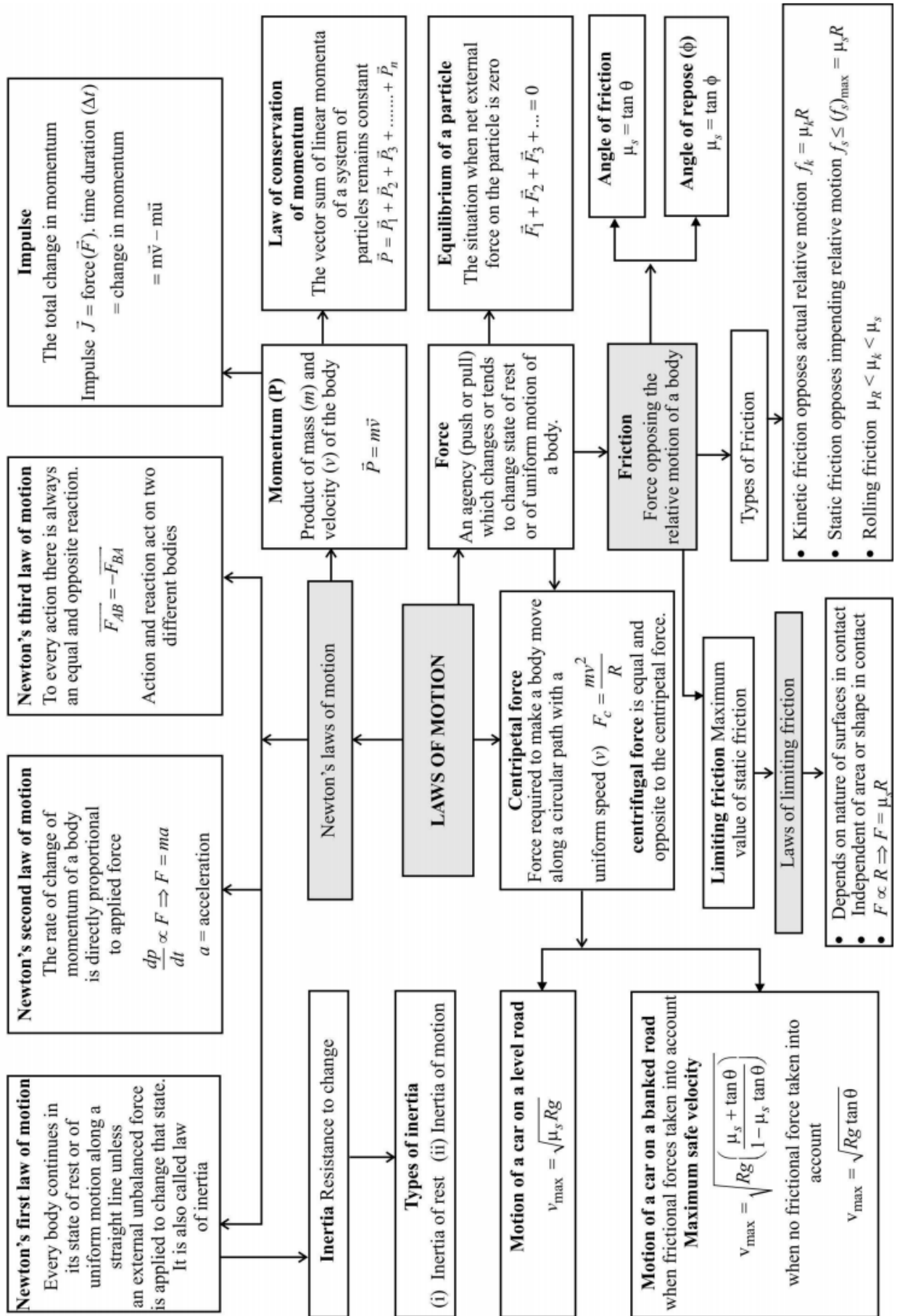




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CHAPTER 5 LAWS OF MOTION

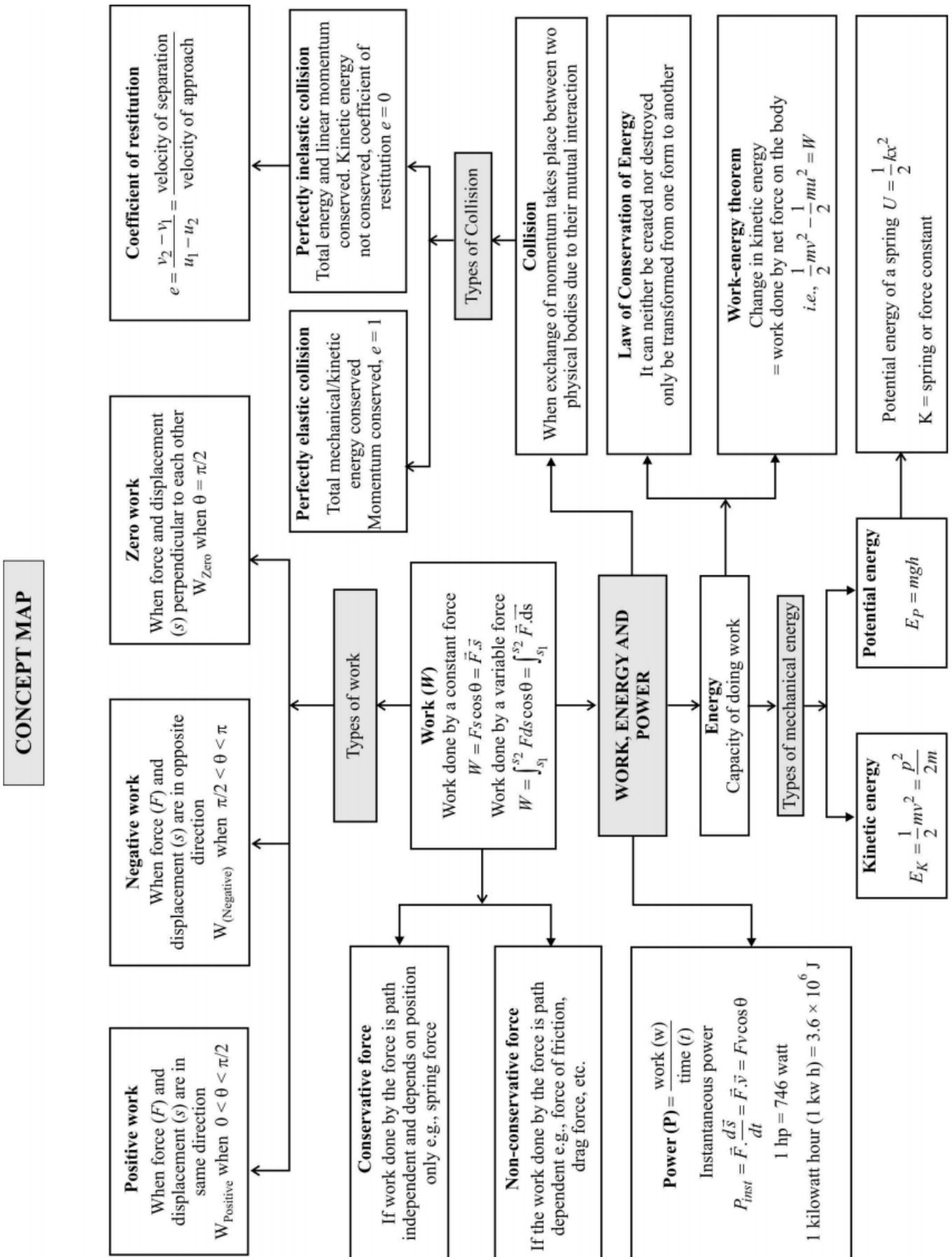
CONCEPT MAP





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CHAPTER 6 WORK POWER ENERGY

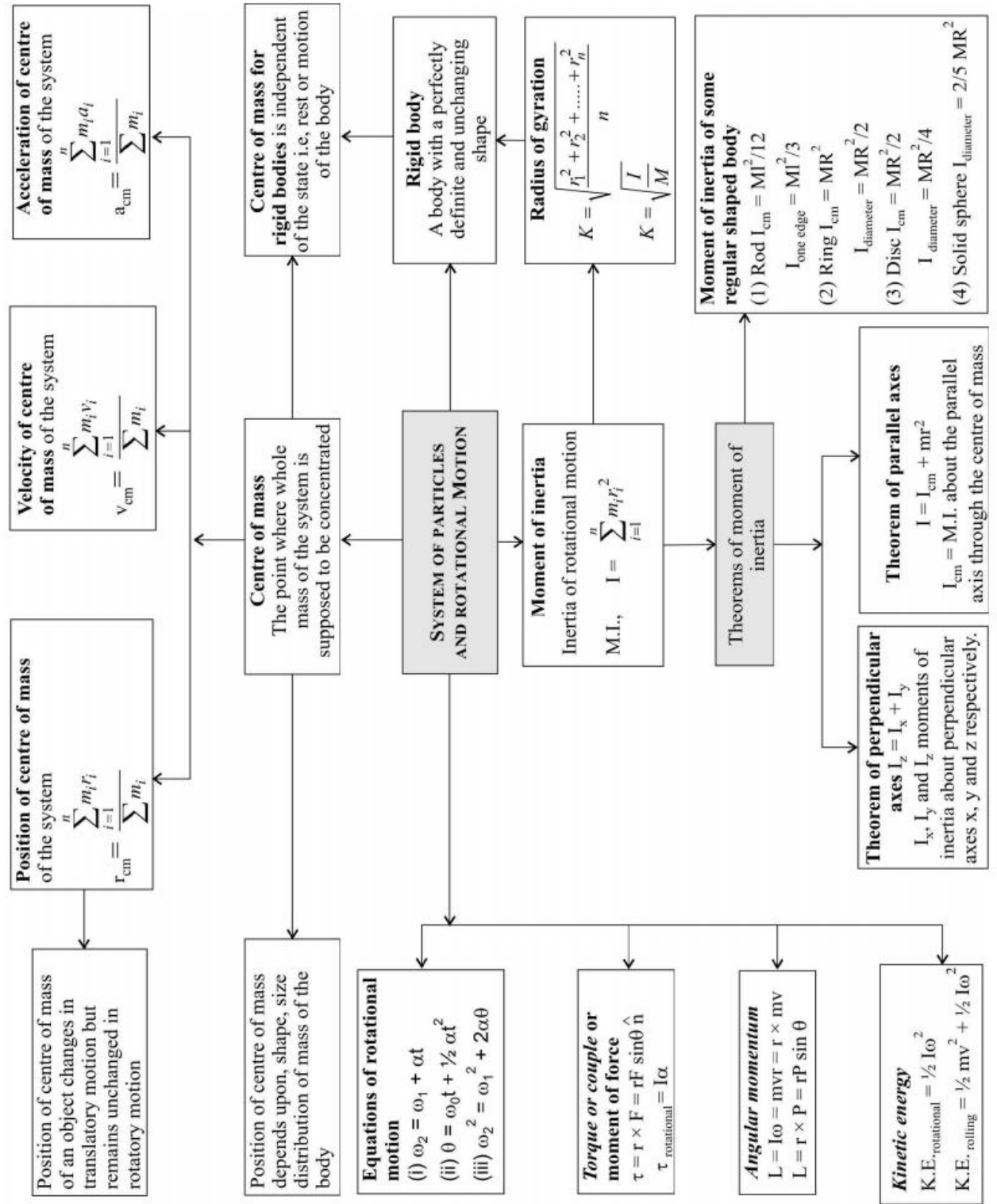




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CHAPTER 7 ROTATIONAL MOTION

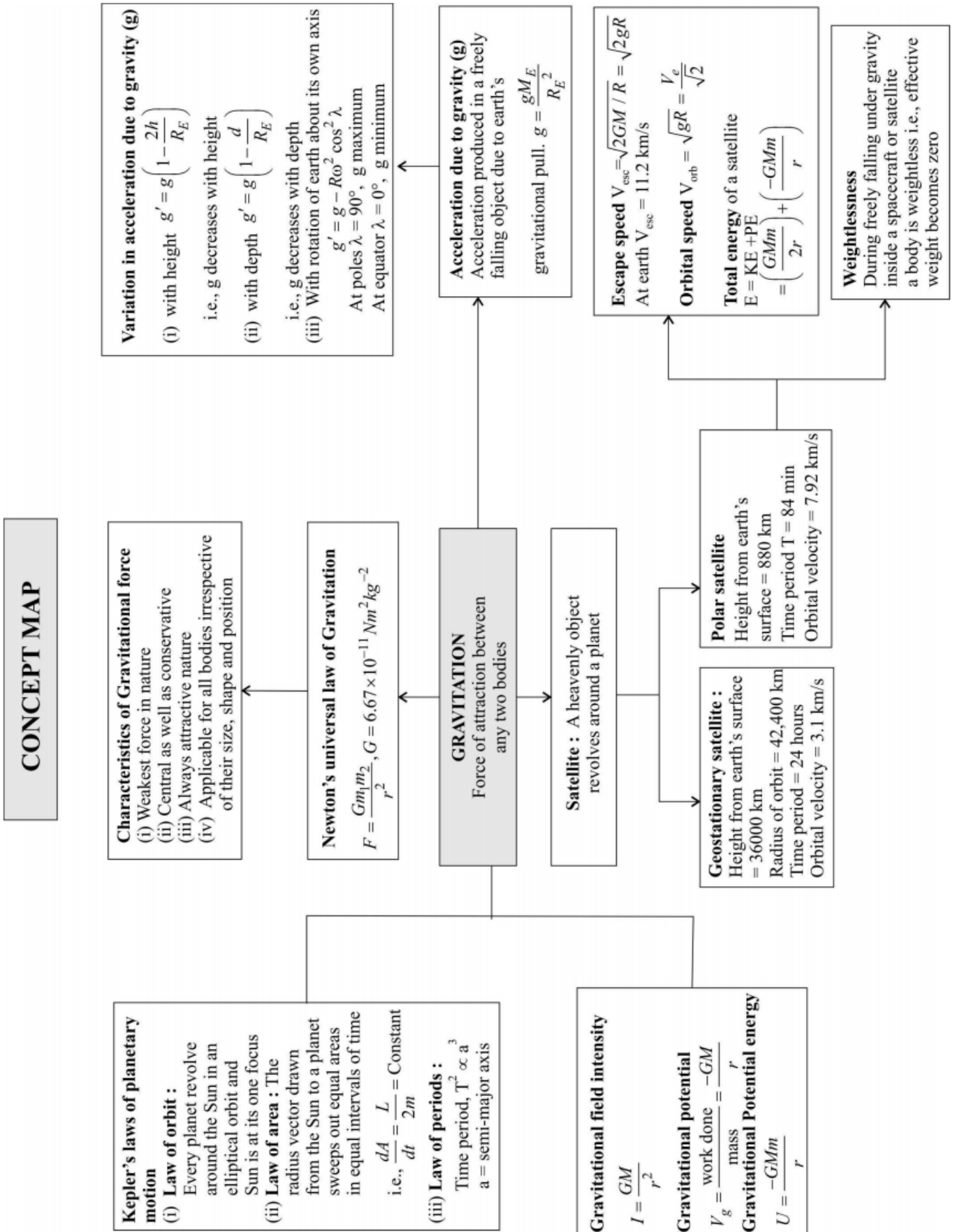
CONCEPT MAP





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CHAPTER 8 GRAVITATION

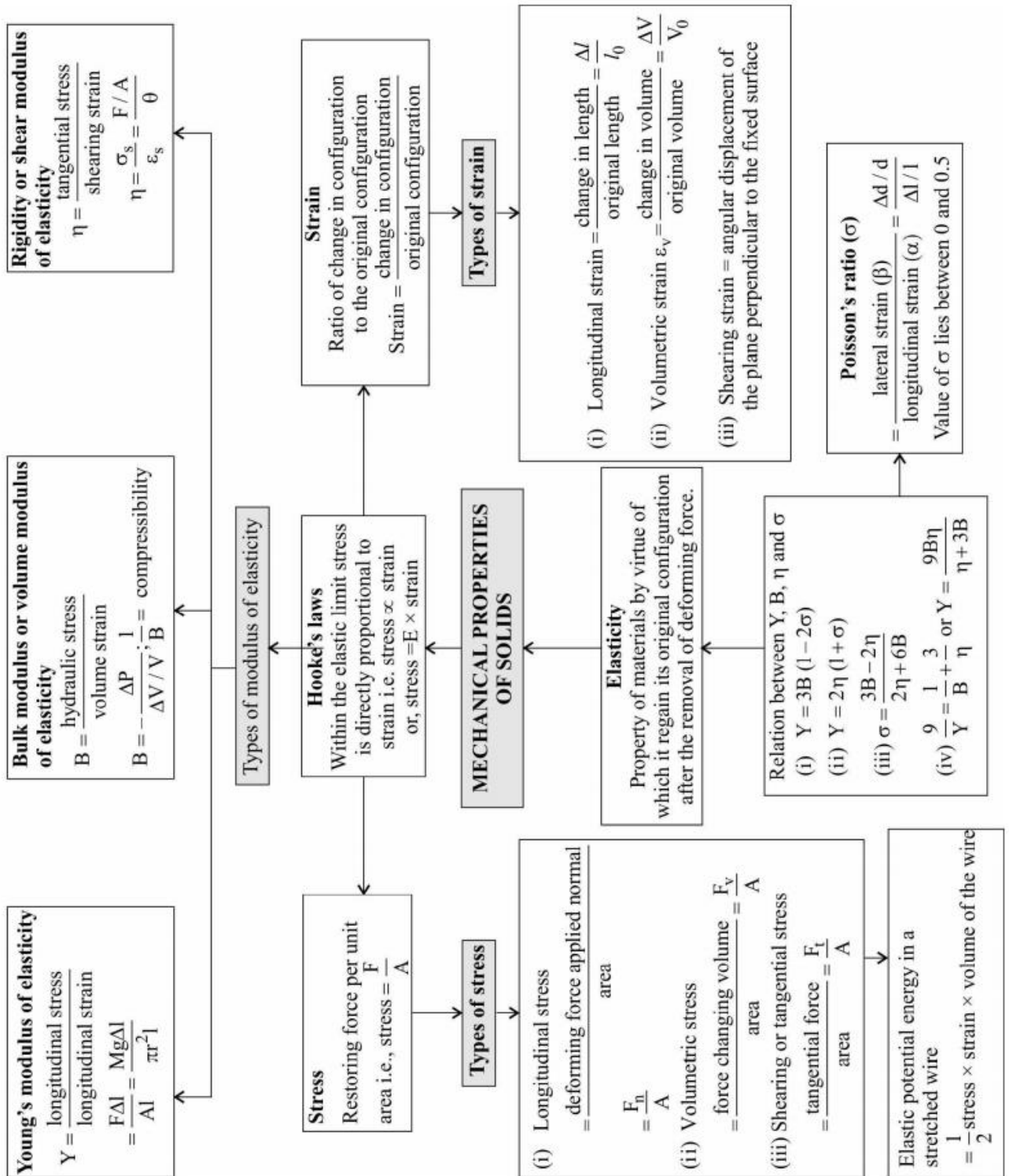




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CHAPTER 9 SOLIDS

CONCEPT MAP

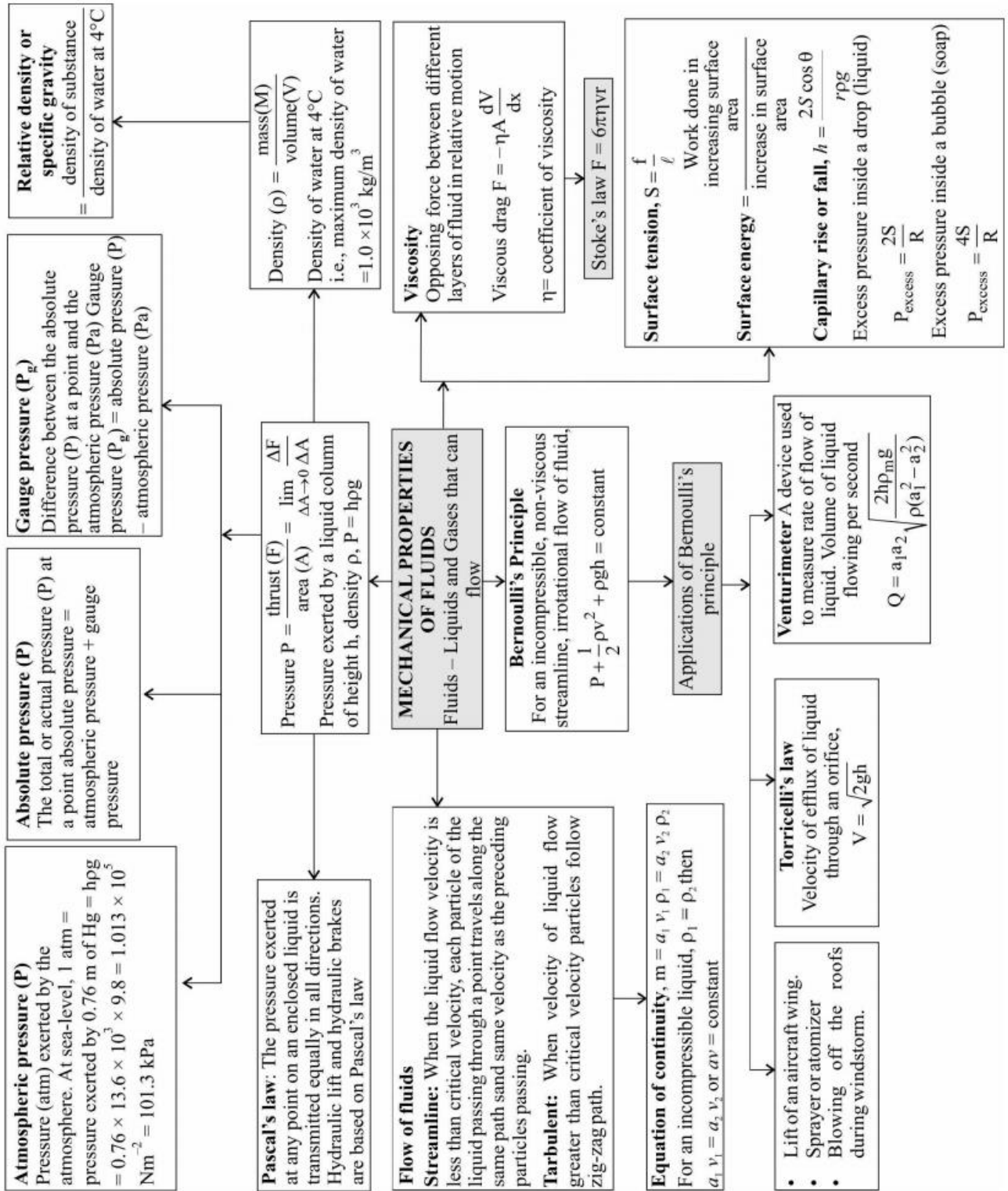




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CHAPTER 10 FLUIDS

CONCEPT MAP

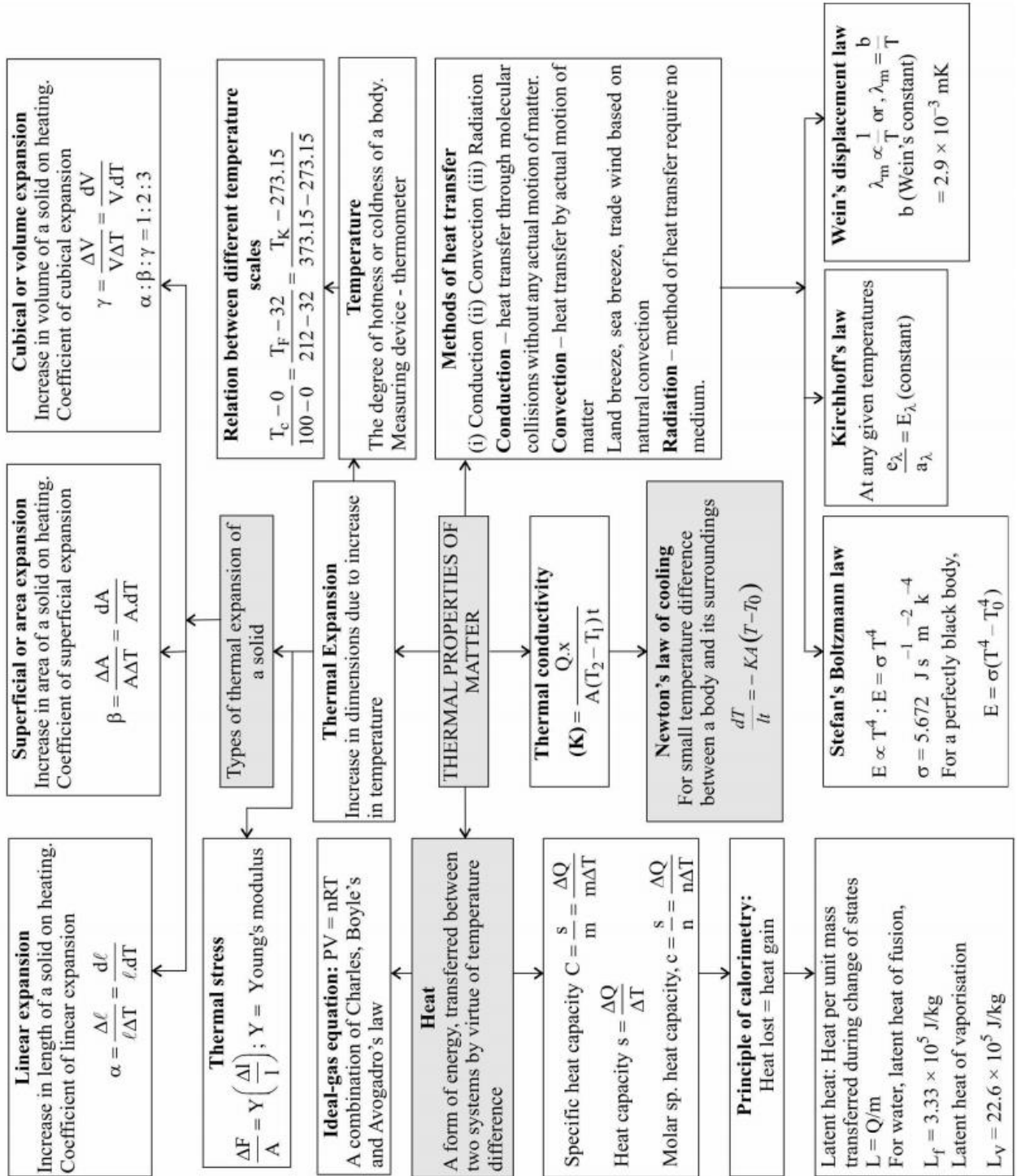




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CHAPTER 11 THERMAL PROPERTIES OF MATTER

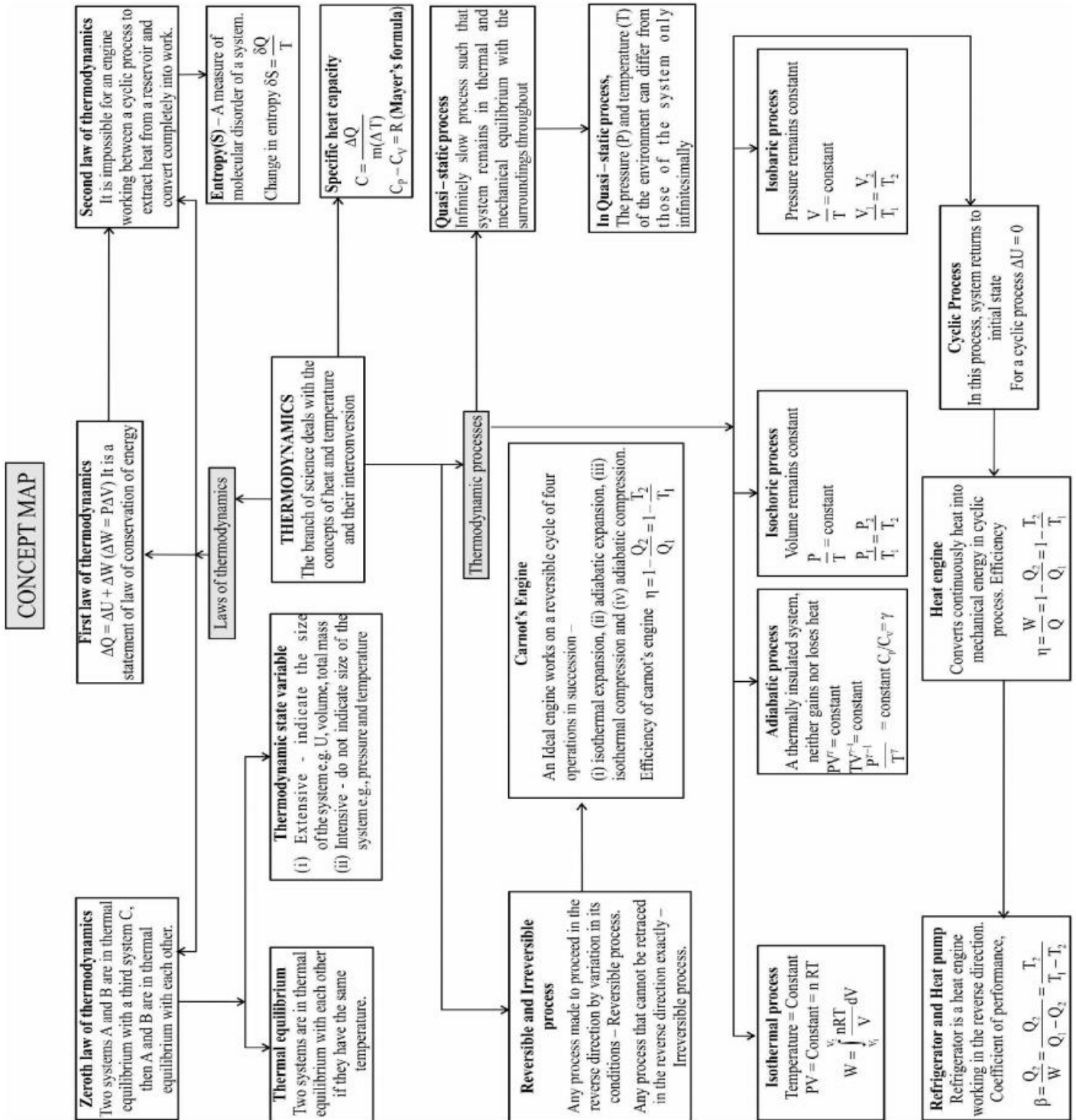
CONCEPT MAP





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CHAPTER 12 THERMODYNAMICS

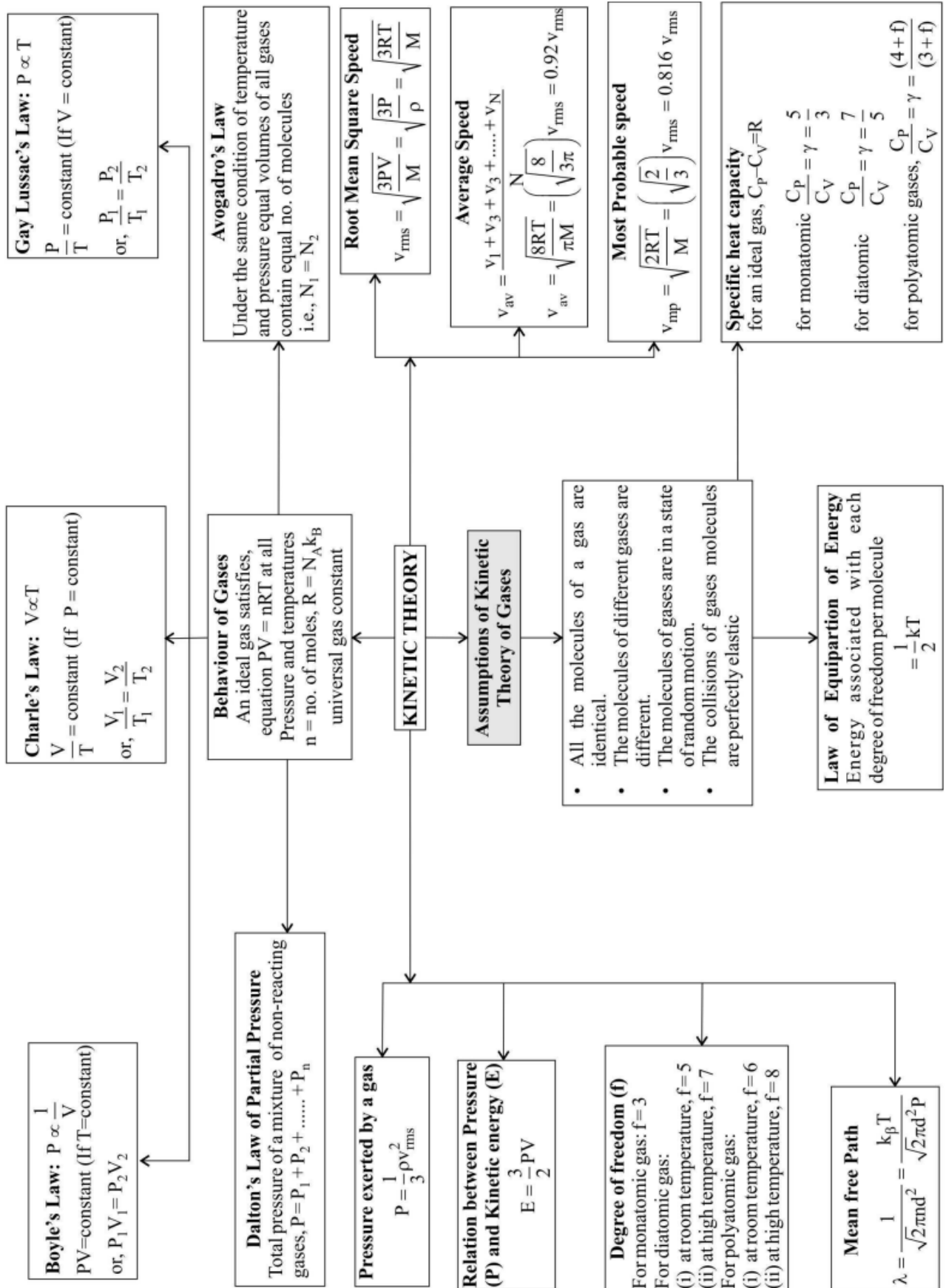




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CHAPTER 13 KINETIC THEORY OF GASES

CONCEPT MAP

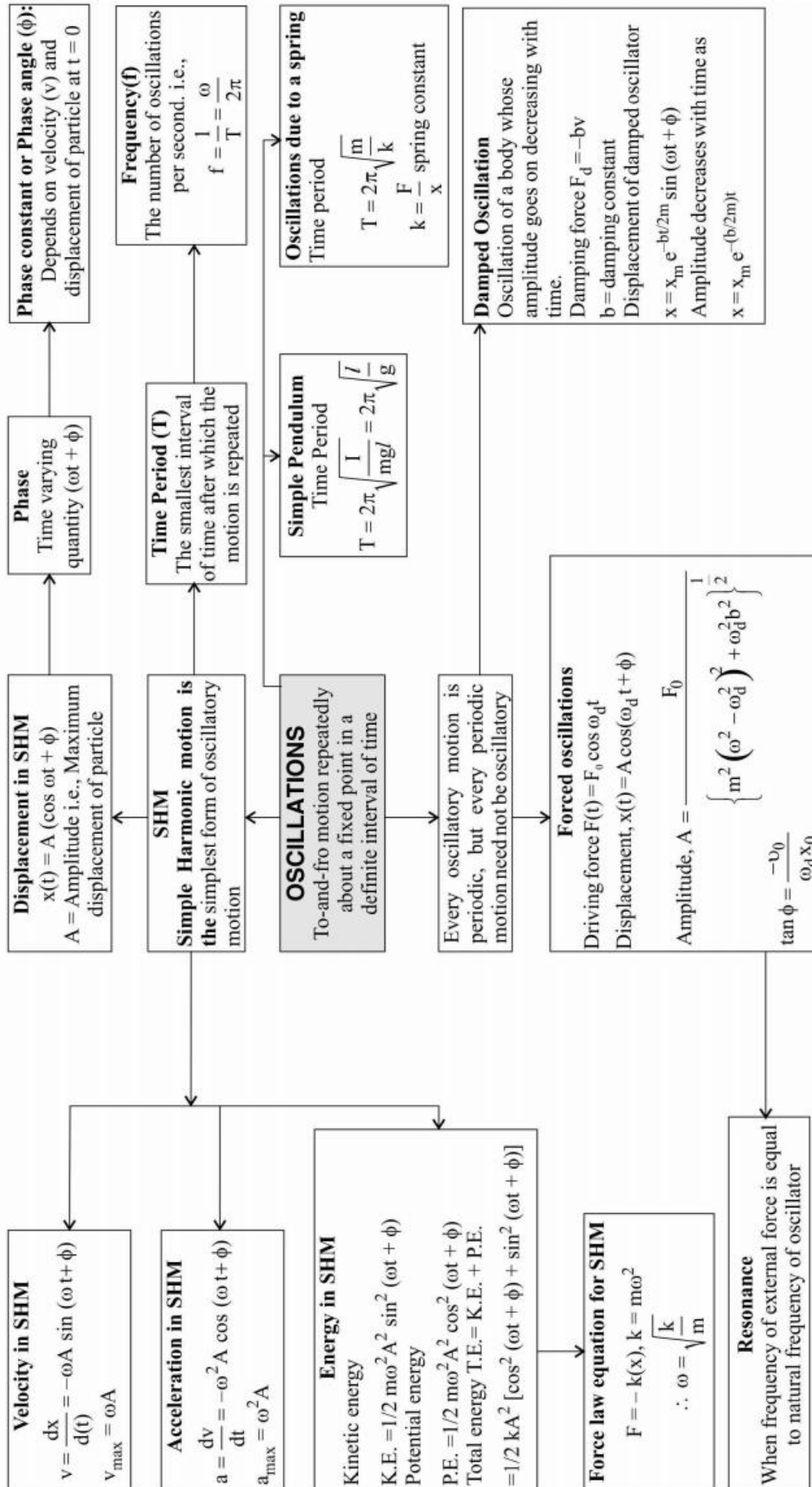




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CHAPTER 14 OSCILLATIONS

CONCEPT MAP





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CHAPTER 15 WAVES

CONCEPT MAP

