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**AGNIVEER SSR**

Senior Secondary Recruit

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Chapter-wise

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1<sup>st</sup> EDITION, YEAR 2023-24



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**SYLLABUS  
COVERED**

## Agniveer Navy - SSR



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# PREFACE

In the vast expanse of the maritime domain, where the rhythmic waves echo tales of courage and commitment, the Agniveer Navy - Senior Secondary Recruits (SSR) examination sets sail as a beacon of knowledge and inspiration.

The Government had launched Agnipath scheme on June 15, 2022 to recruit both male and female aspirants into 'below the officer's rank' cadre of the three services for a period of four years as Agniveers. Candidates between the age group of 17.5 to 21 years are eligible to apply for the scheme.

In 2023, 9 Lacs students appeared for Agniveer Navy SSR exam, this presents an excellent chance for individuals with aspirations to serve the nation by joining the Indian Navy, the opportunity you get from the Indian Navy is just limitless, which helps in enhancing your personality traits.

The Agniveer Navy-SSR - Chapter-Wise book has been meticulously curated to serve as an essential tool in your quest to succeed in the Apnipath Scheme and aims to make aspirants exam-ready, boost their confidence and help them achieve better results in the examination.

Some Benefits of studying from Oswaal Agniveer Navy-SSR– Chapter-wise Question bank is:

1. **Concept Clarity** with easy to grasp theory complemented with Solved Examples
2. **Extensive Practice** with more than 1500 new Questions based on latest exam pattern and Two Sample Question Papers.
3. **Crisp Revision** with Mind Maps offering bite-sized and just-in-time revision tool
4. **Expert Tips** helps you get expert knowledge, master & crack Agniveer Navy in first attempt.
5. **Exam insights** with Chapter-wise weightage Analysis, empowering students to be 100% exam ready.
6. **Quick & Easy Techniques** the book offers Shortcuts & easy to follow Tips and Tricks to help readers solve exam questions efficiently.

May your dreams take flight, and may your journey be as rewarding as it is challenging. Here's to those who dare to dream and to the Agniveer's Navy, where the sky is not the limit but the beginning of a new adventure.



# Be mindful. Be grateful. Be positive. Be true. Be kind

**01**

Three things that make you special

**02**

Three people you are grateful for and why

**03**

Three simple things you are grateful for

**04**

A challenging experience that made you stronger

**05**

Three ways to inject gratitude into a current challenge

**06**

Describe the last time you did something nice for someone

**07**

A fear you have overcome

**08**

Three activities you enjoy most and why

**09**

What made you smile today?

**10**

Three things you love about your family

**11**

What is your favorite place, and why?

**12**

Three things you love most about yourself

**13**

The last time you were overcome with joy

**14**

A risk you are grateful you took and why

**15**

Three everyday items you are grateful for

**16**

Three songs that bring you joy

**17**

What skill do you have that you are grateful for and why?

**18**

One luxury you are thankful for

**19**

Describe a rejection you are grateful for

**20**

Three things about your body you are grateful for

**21**

What are you most grateful for in your daily life?

**22**

Three things you are grateful for about where you live

**23**

Three items in your home you are grateful for

**24**

Say thank you to someone

**25**

Something in nature you are grateful for

**26**

A person in your past you are grateful for

**27**

Something at school you're grateful for

**28**

Describe the last time you laughed so hard you cried

**29**

What is your proudest accomplishment?

**30**

Three things you want to manifest



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□□□



# POSITIVE AFFIRMATIONS

An affirmation is a positive statement or phrase that individuals repeat to themselves with the intention of fostering a positive mindset, self-confidence, or personal development. The practice involves affirming desired beliefs or qualities, often in the present tense, to reinforce a positive self-image and encourage a more optimistic outlook.

**“ EMBRACE YOUR UNIQUENESS, NOURISH SELF-CARE, AND PRESS FORWARD RELENTLESSLY. TO ACHIEVE FLIGHT, UNLOAD THE BAGGAGE THAT SLOWS YOUR ASCENT.”**



I strongly trust in my vision and work diligently towards making it a reality.



I am not defined by grades & test scores. My true worth lies in my character, compassion and positive impact I have on others.



I am capable of learning and growing everyday.



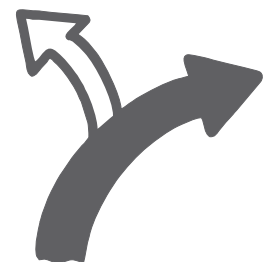
I embrace my mistakes, learn from them and use them to fuel my growth & resilience.



I celebrate my quirks, for they make me beautifully unique.



My voice matters and I believe in the power of my words to shape the world around me.



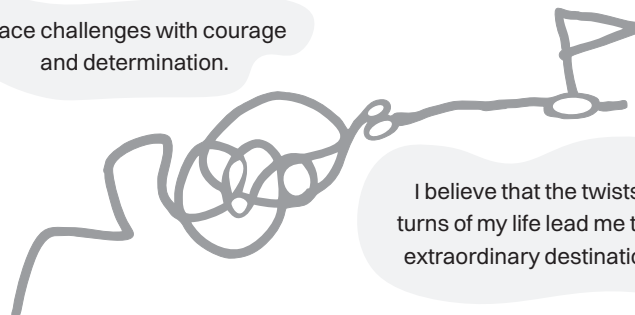
I am not the product of circumstances, I am the product of my own choices.



I face challenges with courage and determination.



I celebrate the achievements of others without diminishing my journey.



I believe that the twists & turns of my life lead me to an extraordinary destinations.



# Tips to Crack Agniveer Navy - SSR in the First Attempt

The Indian Navy conducts the Agniveer Navy exam for recruitment of Senior Secondary Recruit (SSR), The Agnipath Scheme was inducted recently and is one of the National Level Examinations in India. Cracking the Agniveer Navy exam in the first attempt, given the difficulty level, is tricky but attainable if done diligently and smartly. Here are some tips that you must follow by heart to crack the exam in the very first attempt:

## 1 Think Right

Calming yourself and thinking positive is the first and the best course of action that one is required to take. Think and believe that the exam goal is achievable if worked upon smartly.

## 2

### Start studying from the beginning

All the aspirants are aware of how vast, comprehensive and detailed the syllabus of the Agniveer Navy exam is. To crack the exam in the first attempt you have to start preparing for the exam from the beginning of your 10th class. It is only then that you will be able to complete the entire syllabus. Following this approach will also allow you plenty of time to revise.

## 3

### Respect the syllabus and arrange the materials accordingly

While preparing for the Agniveer Navy exam nothing can be labelled as less important. Questions can come from the most unexpected topic too. Laying down your whole syllabus in front of you will help you to decide on the study material you require.

## 4

### Get the right tools and study material

Gathering and preparing from the appropriate study material is something you cannot be ignorant towards. You can refer to Oswaal Books Agniveer Navy Chapter-wise Question Bank to enhance your preparation. This reference book is on the lines of the current syllabus and can be entrusted upon before the examination.

## 5

### Schedule total time for each subject

Creating a schedule which gives due time to all the subjects is a must. Giving proper time to all the subjects daily will help you cover the syllabus on time, giving you enough time for revision.

## 6

### Understand the concepts

No one can crack the Agniveer Navy Exam just by mugging up all the concepts and topics. The syllabus of the exam is in-depth such that you need to understand every concept.

## 7

### Practice a lot of Sample Papers

Agniveer Navy Chapter-wise Question Bank will not only help you in understanding the examination pattern, but they will also help you in figuring out the questions that come up every year and this might give you an edge over other students. You can refer to Oswaal the Agniveer Navy book as it includes all the Examination with solution, Mind Maps, etc. Referring to various sample papers might also help you in comprehending the areas which require more work.

## 8

### Revise whenever you get time

Make sure you revise as much as possible. The revision will help you in keeping the concepts fresh in your mind.

## 9

### Analysing your performance

While you are solving papers, make sure you keep a track of time i.e. how much time does it take to solve one section or one question? Make a report of the sections and type of questions which take minimum and maximum time.

# SYLLABUS

## Agniveer Navy - SSR

Agniveer Vayu Subjects	Topics
<b>English</b>	Passage, Preposition, Correction of sentences, Change active to passive/passive to active voice Change direct to indirect/indirect to direct, Verbs/Tense/Non Finites, Punctuation Substituting phrasal verbs for expression, Synonyms and Antonyms, Meanings of difficult words Use of adjective, Compound preposition, Determiners (use of a, the, any etc), Use of pronouns
<b>Mathematics</b>	Relations and Functions, Logarithms, Complex Numbers, Quadratics Equations, Sequences and Series, Trigonometry Cartesian System of Rectangular Coordinates, Straight Lines Family of Straight Lines, Circles Conic Section, Permutations and Combinations, Vectors, Exponential and Logarithmic Series, Sets and Set Theory, Statistics Introduction to Three-Dimensional Geometry, Probability Function, Limits and Continuity, Differentiation, Applications of Derivatives Indefinite Integrals Binomial Theorem, Matrices, Determinants, Definite Integrals

## Contd....

<p style="text-align: center;"><b>Science</b></p>	<p>Physical World and Measurement, Kinematics, Laws of Motion, Work, Energy and Power, Motion o System of Particles and Rigid Body/Gravitation Mechanics of Solids and Fluids, Heat Thermodynamics, Oscillations, Waves, Electrostatics, Current Electricity Magnetic Effect of Current and magnetism, Electromagnetic Induction and Alternating Current, Electromagnetic Waves Optics, Dual Nature of Matter and Radiations, Atomic Nucleus/ Solid and Semi-Conductor Devices, Principles of Communication Metals and Non-Metals, Organic Chemistry, Food, Nutrition and Health, Physiology and Human Diseases, Computer Science</p>
<p style="text-align: center;"><b>General Awareness</b></p>	<p>Culture and Religion, Geography : Soil, Rivers, Mountains, Ports, Inland Harbours, Freedom Movement Sports : Championships/Winners/ Terms/ No. of Players, Defence, Wars and Neighbours, current Affairs Important National Facts about India-Heritage, Arts, Dance, History, National—Languages, Bird, Animal, Song, Flag, Monuments, Capitals &amp; Currencies Common Names, Full forms and Abbreviations, Discoveries, Diseases and Nutrition, Award and Authors, Eminent Personalities Spatial, Numerical, Reasoning &amp; Associative Ability, Sequences, Spellings Unscrambling, Coding and Decoding</p>

## Scheme of Examination - Agniveer Navy-SSR

Subjects	No. of Questions	Total Marks	Exam Duration
English	25	25	1 hour (60 minutes)
Science	25	25	
Mathematics	25	25	
General Knowledge	25	25	
<b>Total</b>	<b>100</b>	<b>100</b>	

### MARKING SCHEME FOR AGNIVEER NAVY-SSR 2024

- (i) For every correct answer, 1 mark shall be awarded.
- (ii) For every wrong answer, 0.25 marks shall be deducted.
- (iii) For questions left blank, 0 mark shall be deducted.



## Eligibility Criteria

<b>Age Criteria</b>	Candidates must have born between 01 May 2002 –31 Oct 2005
<b>Educational Qualifications</b>	<ul style="list-style-type: none"> <li>• MR: Passed Matriculation Examination from a recognized Board of School Education</li> <li>• SSR: Passed 10+2 Examination from a recognized board with Maths and Physics along with either Computer Science/ Biology/ Chemistry</li> </ul>
<b>Nationality</b>	Indian
<b>Number of Attempts</b>	Till the candidates have crossed their maximum age restrictions.
<b>Experience</b>	Previous experience is not required

### Education Criteria

Post Name	Educational Qualification
<b>Agniveer (SSR)</b>	Qualified in 10+2 exam with Mathematics, Physics, and at least one of these subjects: Chemistry/Biology/Computer Science from an educational board recognized by Ministry of Education, Govt of India
<b>Agniveer (MR)</b>	Candidate must have passed Matriculation Examination from a recognized Board of School Education

### Physical Fitness

Gender	1.6 Km Run	Squats	Push-Ups	Bent Knee Sit Ups
Male	6 minutes 30 sec	20	1	-
Female	8 minutes	15	-	10

### Indian Navy Agniveer Medical Standards

Gender	Minimum Height (cms)
Male	157
Female	152

### Visual Standards

Particulars	Without Glasses	With Glasses
Better Eye	6/6	6/6
Worse Eye	6/9	6/6

## Pay and Perks

**Pay, Allowances and Allied Benefits**—Agniveers will be paid a customised package of ₹30,000 per month with a fixed yearly increment. In addition, risk and hardship, dress and travel allowances will be paid.

**Terminal Benefits**—Seva Nidhi Package. Agniveers shall be given a one-time Seva Nidhi package comprising their monthly contribution along with matching contribution by the government on completion of their engagement period, as indicated below:—

Year	Customised Package (Monthly)	In Hand (70%)	Contribution to Agniveers Corpus Fund (30%)	Contribution to Corpus fund by GoI
All figures in Rs (Monthly Contribution)				
1st Year	30,000	21,000	9,000	9,000
2nd Year	33,000	23,100	9,900	9,900
3rd Year	36,500	25,550	10,950	10,950
4th Year	40,000	28,000	12,000	12,000
Total Contribution in Agniveers Corpus Fund after four years			Rs. 5.02 lakh	Rs. 5.02 lakh
Exit after 4 year		<b>Rs. 10.04 Lakhs as Seva Nidhi Package</b> (absolute amount excluding interest)		

**Note:**

1. Agniveers will not be required to contribute to any Provident Fund of the Government.
2. There shall be no entitlement of gratuity and no pensionary benefits in the case of Agniveers.
3. The 'Seva Nidhi' package will be exempt from Income Tax.

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Vedic Maths (Ashima Sekhri)

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English, Accountancy, Biology, Business Studies, Chemistry, Mathematics/Applied Mathematics, Entrepreneurship, Computer Science/Informatics Practices, Sociology, Economics, Geography, History, Physics, Political Science, Psychology, Physical Education, (Quantitative Aptitude, Logical Reasoning General Awareness),

## CDS Chapter-Wise & Topic-Wise Solved Papers (2014-2023)

Elementary Mathematics, English, General Knowledge

## NDA-NA Chapter-Wise & Topic-Wise Solved Papers (2014-2023)

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<b>DURG</b>	Bhagwati Bhawani Book Depot, 0788-2327620, 9827473100
<b>KORBA</b>	Kitab Ghar, Korba ( E & C ), 9425226528
<b>RAIPUR</b>	Shri Ramdev Traders, 9981761797, Gupta Pustak Mandir, 7974220323, Anil Publication, 9691618258/7999078802
<b>RAIGARH</b>	Sindhu Book Deopt, 9981935763
<b>DELHI</b>	<b>DELHI</b> Mittal Books, (011) 23288887, 9899037390, Singhania Book & Stationer, 9212028238, AoneBooks, New Delhi, 8800497047, Radhey Book Depot, 9818314141, Batheja Super Store, 9871833924, Lov Dev & Sons, Delhi ( E & C ), 9811182352, Zombozone, 9871274082, LDS Marketing, 9811182352/9999353491
<b>AHMEDABAD</b>	<b>GUJARAT</b> Patel Book, 9898184248, 9824386112, 9825900335, Zaveri Agency, 9979897312, 9979890330, Hardik Book Agency, (ISC) 079-24110043, 9904659821
<b>BHAVNAGAR</b>	Samir Book Stall, Bhavnagar (ISC) 9586305305
<b>DAHOD</b>	Collegian Book Corner, 9925501981
<b>VAPI</b>	Goutam Book Sellers, 9081790813
<b>VALSAD</b>	Mahavir Stationers, 9429474177
<b>NAVSARI</b>	College Store, (ISC) NO CALL 02637-258642, 9825099121
<b>SURAT</b>	Shopping Point, 9824108663
<b>VADODARA</b>	Umakant Book Sellers & Stationer, 9624920709 <b>HARYANA</b>
<b>ROHTAK</b>	Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088,
<b>REWARI</b>	Babu Ram Pradeep Kumar, 9813214692
<b>BALLABGARH</b>	Sanjay book depot, 9255447231
<b>HISAR</b>	Kashi Ram Kishan Lal, 9289504004, 8920567245
<b>BHUNA</b>	Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520
<b>JAMMU</b>	Sahitya Sangam, 9419190177
<b>BOKARO</b>	<b>JHARKHAND</b> Bokaro Student Friends, (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 9431740797
<b>RANCHI</b>	Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 9431115138,
<b>DUMKA</b>	Vidyarthi Pustak Bhandar, 9431310228
<b>HUBLI</b>	<b>KARNATAKA</b> Renuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976
<b>BANGLORE</b>	Krishna book house, 9739847334, Hema Book Stores, 9986767000,  Sapna Book House Pvt. Ltd., 9980513242, Hema Book World, (Chamrajpet) (ISC) 080-40905110, 9945731121
<b>BELLERI</b>	Chatinya book centre, 9886064731 <b>KERALA</b>
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<b>GWALIOR</b>	Agarwal Book Depot, 9425116210

<b>INDORE</b>	Bhaiya Industries, 9893326853, Sushil Prakashan,(0731) 2503333, 2535892, 9425322330, Bhaiya Store, 9425318103, Arun Prakashan, 9424890785, Bhaiya Book Centre, 9424081874, Seva Suppliers, 9826451052
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<b>UJJAIN</b>	Shreenath Book Depot, 9827544045
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<b>MUMBAI</b>	Vidyarthi Sales Agencies, 9819776110, New Student Agencies, 7045065799, Shivam Books & Stationery, 8619805332
<b>JALGAON</b>	Sharma Book Depot & Stat. (ISC), 9421393040
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<b>KOLHAPUR</b>	Granth the Book World, 9922295522
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<b>NANDED</b>	Renuka Book distributor, 9765406133, Novelty Book Depot, 9657690220, Karamveer Book Depot, 9923966466, Arun Book & Stationers, 9423110953
<b>NASHIK</b>	Abhang Pustakalaya, 9823470756/9175940756
<b>DHULE</b>	Rahul Book Centre, 9970849681, New India Book House, 9623123458
<b>YAVATMAL</b>	Navjeevan Book Stall, 7020525561
<b>VASAI</b>	Shri Ganesh Pustkalaya, 9423131275 Prime Book Centre, Vasai, 9890293662
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<b>BHUBANESHWAR</b>	M/s Pragnya, 8847888616, 9437943777, Padmalaya, 9437026922, Bidyashree, 9937017070, Books Godown, 7894281110
<b>BARIPADA</b>	Trimurti Book World, 9437034735
<b>KEONJHAR</b>	Students corner, 7008435418 <b>PUNJAB</b>
<b>AMBALA</b>	Bharat Book Depot, 7988455354
<b>PATIALA</b>	Goel Sons, 9463619978, Adarsh Enterprises, 9814347613
<b>JALANDHAR</b>	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248
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<b>BHILWARA</b>	Nakoda Book Depot, (01482) 243653, 9214983594, Alankar Book Depot, 9414707462
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<b>JODHPUR</b>	Second Hand Book Stall, 9460004745
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<b>PUDUCHERRY</b>	Sri Lakshmi Book Seller, 7871555145
<b>SALEM</b>	Pattu book centre, 9894816280
<b>TRICHY</b>	P.R.Sons Book Seller, 9443370597, Rasi Publication, 9894816280
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<b>MADURAI</b>	Selvi Book Shoppe, 9843057435, Jayam Book Centre, 9894658036
<b>VELLORE</b>	G.K book centre and collections, 9894517994
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<b>MUSSORIE</b>	Ram Saran Dass Chanda kiran, 0135-2632785, 9761344588
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<b>AGRA</b>	Sparsh Book Agency, 9412257817, Om Pustak Mandir, (0562) 2464014, 9319117771, Sanjay Publication, 8126699922 Arti book centre, 8630128856, Panchsheel Books, 9412257962, Bhagwati Book Store, (E & C), 9149081912
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<b>ALIGARH</b>	K.B.C.L. Agarwal, 9897124960, Shaligram Agencies, 9412317800, New Vimal Books, 9997398868, T.I.C Book centre, 9808039570
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<b>BALRAMPUR</b>	Universal Book Center, 8933826726
<b>BAREILLY</b>	Siksha Prakashan, 9837829284
<b>HARDOI</b>	Mittal Pustak Kendra, 9838201466
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<b>VARANASI</b>	Gupta Books, 8707225564, Bookman & Company, 9935194495/7668899901
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<b>JHANSI</b>	Bhanu Book Depot, 9415031340
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<b>NOIDA</b>	Prozo (Global Edu4 Share Pvt. Ltd), 9318395520, Goyal Books Overseas Pvt.Ltd., 1204655555 9873387003
<b>PRAYAGRAJ</b>	Kanhaiya Pustak Bhawan, 9415317109
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<b>RENUKOOT</b>	Om Stationers, 7007326732
<b>COOCH BEHAR</b>	S.B. Book Distributor, Cooch behar, 9002670771
<b>KHARAGPUR</b>	Subhani Book Store, 9046891334
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<b>DINAJPUR</b>	Krishna Book House, 7031748945
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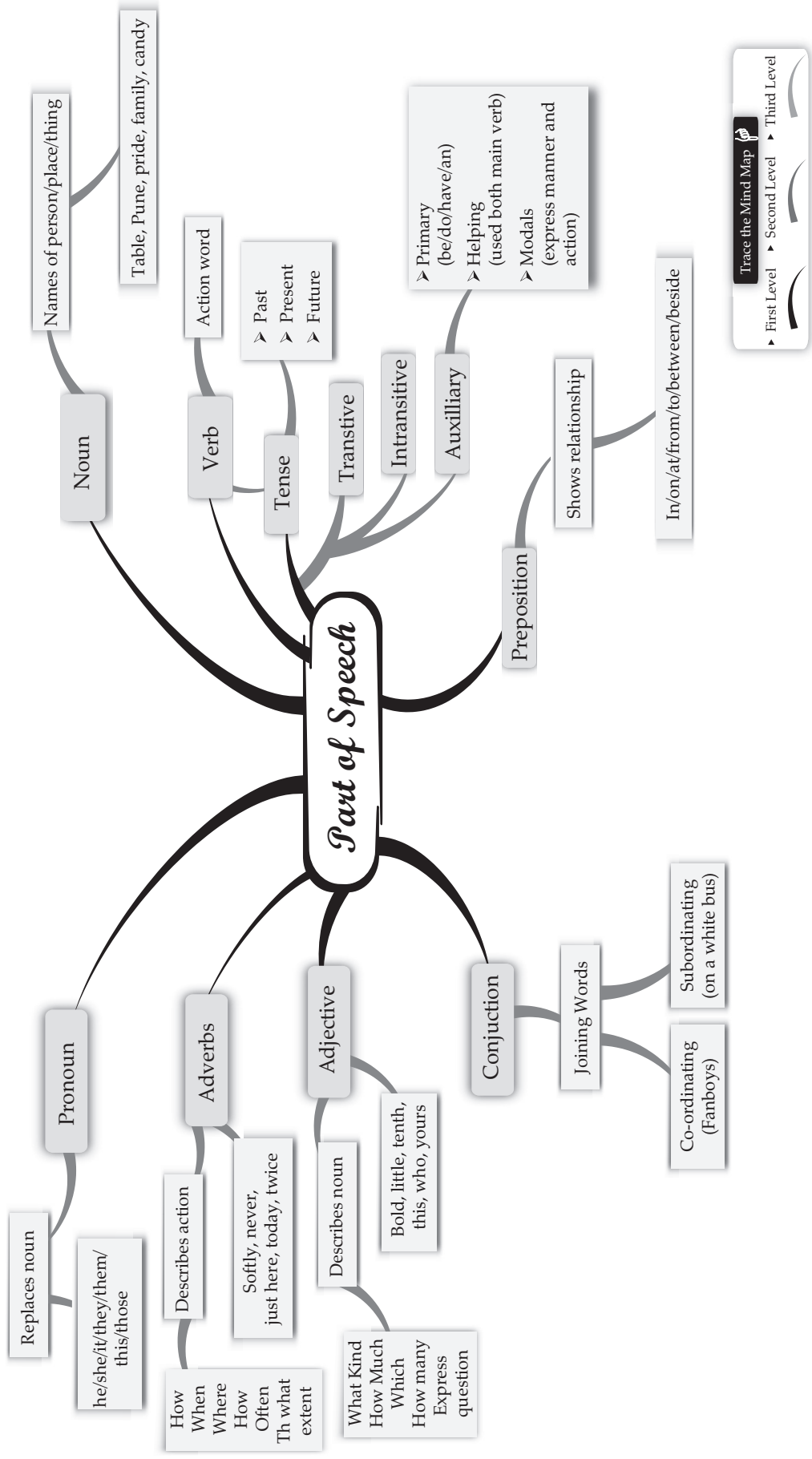
## Entrance & Competition Distributors

	<b>BIHAR</b>
<b>PATNA</b>	Metro Books Corner, 9431647013, Alka Book Agency, 9835655005, Vikas Book Depot, 9504780402
	<b>CHATTISGARH</b>
<b>KORBA</b>	Kitab Ghar, 9425226528, Shri Ramdev Traders, 9981761797
	<b>DELHI</b>
<b>DELHI</b>	Singhania Book & Stationer, 9212028238, Radhey Book depot, 9818314141, The Book Shop, 9310262701, Mittal Books, 9899037390, Lov Dev & Sons, 9999353491
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<b>AMBALA</b>	Bharat Book Depot, 7988455354
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<b>INDORE</b>	Bhaiya Industries, 9109120101
<b>CHHINDWARA</b>	Pustak Bhawan, 9827255997
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<b>NAGPUR</b>	Laxmi Pustakalay and Stationers, (0712) 2727354
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<b>JAIPUR</b>	Goyal Book Distributors, 9414782130
	<b>UTTAR PRADESH</b>
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<b>ALIGARH</b>	New Vimal Books, 9997398868
<b>ALLAHABAD</b>	Mehrotra Book Agency, (532) 2266865, 9415636890
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<b>KOLKATA</b>	Bijay Pustak Bhandar Pvt. Ltd., 8961260603, Saha Book House, 9674827254 United Book House, 9831344622, Techno World, 9830168159

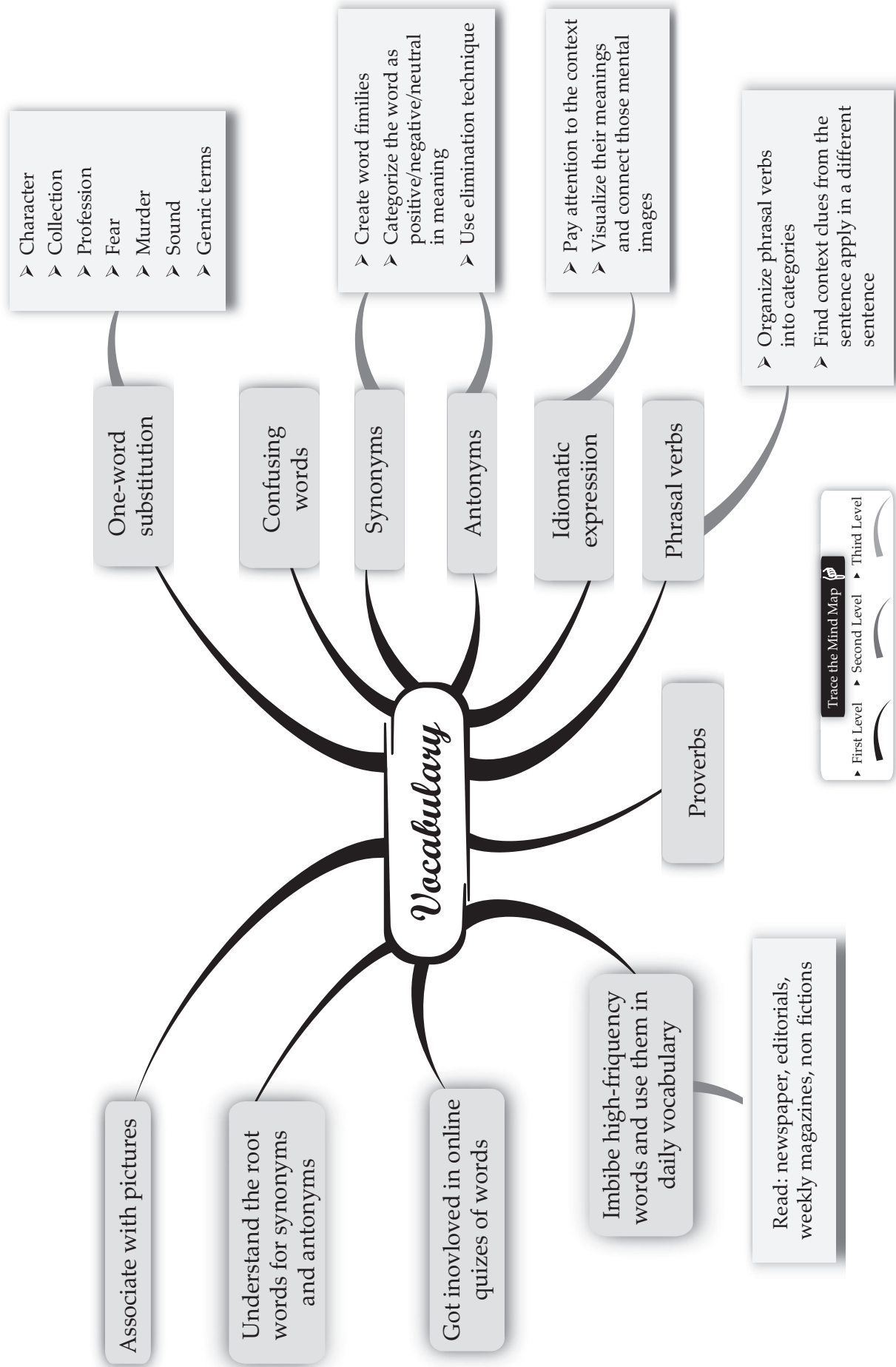
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# MINDMAPS

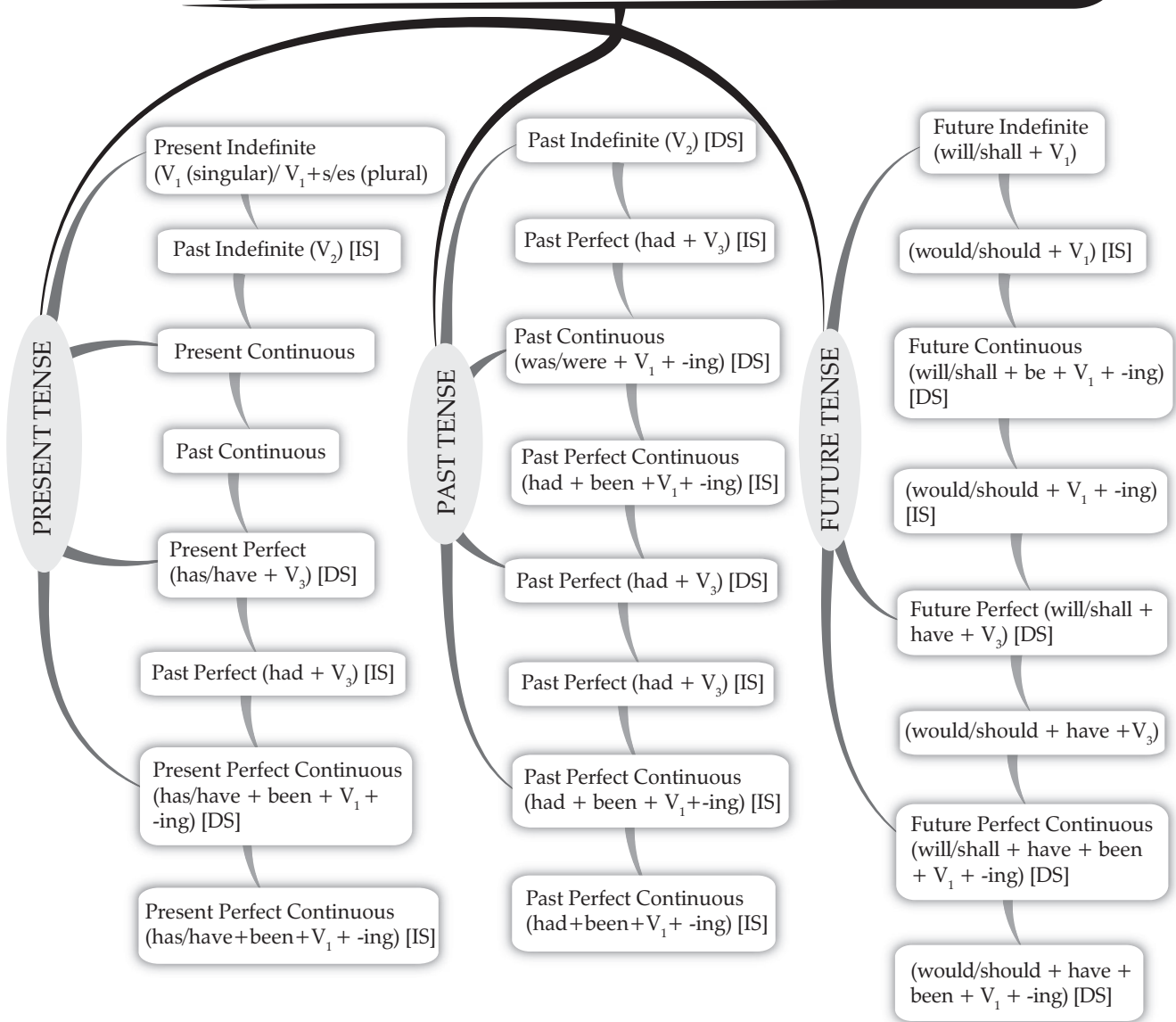


Trace the Mind Map

- ▶ First Level
- ▶ Second Level
- ▶ Third Level



# Change of Tense of Verbs of Direct Narration



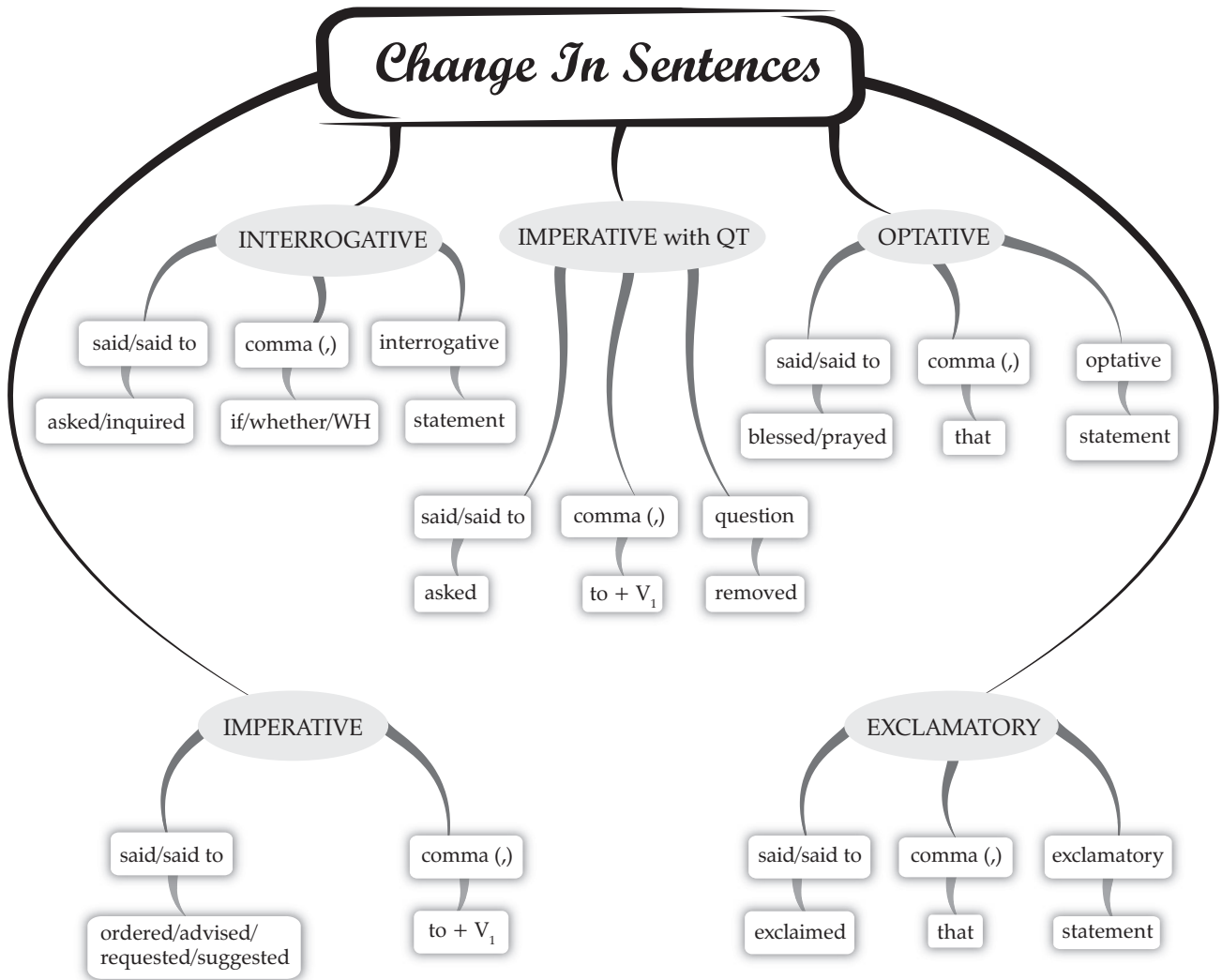
**Note :**

- ▶ DS – Direct Sentence
- ▶ IS – Indirect Sentence

**Trace the Mind Map**

- ▶ First Level
- ▶ Second Level
- ▶ Third Level





**Trace the Mind Map**

▶ First Level   ▶ Second Level   ▶ Third Level

Let  $a = r \cos \theta$   
 $b = r \sin \theta$   
 where,  
 $r = |z|$   
 and  $\theta = \arg(z)$   
 $\therefore z = a + ib = r(\cos\theta + i\sin\theta)$   
 The argument ' $\theta$ ' of complex number  $z = a + ib$  is called principal argument of  $z$  if  $-\pi < \theta \leq \pi$ .

If  $z = a + ib$  is a complex number  
 (i) Distance of  $z$  from origin is called as modulus of complex number  $z$ .  
 It is denoted by  $r = |z| = \sqrt{a^2 + b^2}$   
 (ii) Angle  $\theta$  made by OP with +ve direction of X-axis is called argument of  $z$ .

$i = \sqrt{-1}, i^2 = -1$   
 In general,  $i^{4k+r} = \begin{cases} 1; r=0 \\ i; r=1 \\ -1; r=2 \\ -i; r=3 \end{cases}$ , where  $k \in \mathbb{R}$

**Complex Numbers & Quadratic Equations**

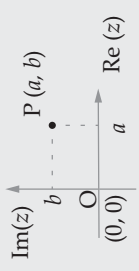
- Modulus & Argument of Complex Number
- Polar Representation of Complex Number
- Square root of Complex Number
- Multiplicative Inverse of complex Number
- Solution of Quadratic Equation
- Definition of Complex Numbers
- Algebra of Complex Numbers
- Powers of 'i'
- Argand plane

Let  $z = x + iy = \sqrt{a + ib}$ , squaring both sides, we get  $(x + iy)^2 = a + ib$  i.e.  $x^2 - y^2 = a, 2xy = b$  solving these equations, we get square root of  $z$ .

For a non-zero complex number  $z = a + ib$  ( $a \neq 0, b \neq 0$ ), there exists a complex number  $\frac{a}{a^2 + b^2} + \frac{-b}{a^2 + b^2}i$  denoted by  $\frac{1}{z}$  or  $z^{-1}$ , called multiplicative inverse of  $z$  Such that  $(a + ib)\left(\frac{a}{a^2 + b^2} + \frac{-b}{a^2 + b^2}i\right) = 1 + 0i = 1$

• General form of quadratic equation in  $x$  is  $ax^2 + bx + c = 0$ , Where  $a, b, c \in \mathbb{R}$  &  $a \neq 0$   
 The solutions of given quadratic equation are given by  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$   
 (i) If  $b^2 - 4ac > 0$ , roots are real and unequal  
 (ii) If  $b^2 - 4ac = 0$ , roots are real and equal  
 (iii) If  $b^2 - 4ac < 0$ , roots are imaginary  
**Note:** • A monomial equation has one root.  
 • A polynomial equation of degree  $n$  has  $n$  roots.

A complex number  $z = a + ib$  can be represented by a unique point  $P(a, b)$  in the argand plane  
 $z = a + ib$  is represented by a point  $P(a, b)$

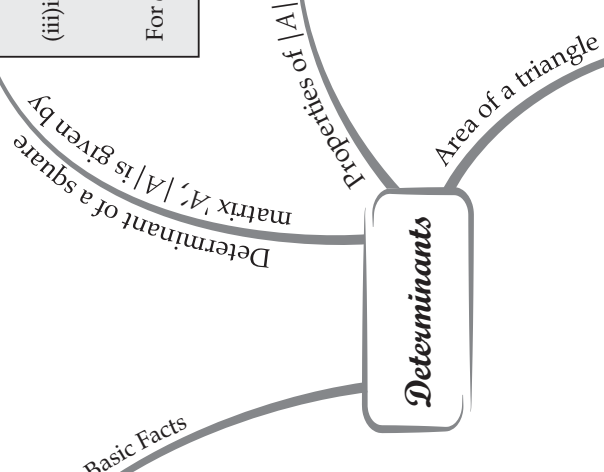


**Let:**  $z_1 = a + ib$  and  $z_2 = c + id$  be two complex numbers, where  $a, b, c, d, z_2 \in \mathbb{R}$  and  $i = \sqrt{-1}$   
**1. Addition:**  $z_1 + z_2 = (a + ib) + (c + id) = (a + c) + i(b + d)$   
**2. Subtraction:**  $z_1 - z_2 = (a + ib) - (c + id) = (a - c) + (b - d)i$   
**3. Multiplication:**  $z_1 \cdot z_2 = (a + ib)(c + id) = a(c + id) + ib(c + id) = (ac - bd) + (ad + bc)i$  ( $\because i^2 = -1$ )  
**4. Division:**  $\frac{z_1}{z_2} = \frac{a + ib}{c + id} = \frac{a + ib}{c + id} \cdot \frac{c - id}{c - id} = \left(\frac{ac + bd}{c^2 + d^2}\right) + \left(\frac{bc - ad}{c^2 + d^2}\right)i$   
**Note:** If  $a + ib = c + id$   
 $\Leftrightarrow a = c$  &  $b = d$

A number of the form  $a + ib$ , where  $a, b \in \mathbb{R}$  and  $i = \sqrt{-1}$  is called a complex number and denoted by ' $z$ '.  
 $z = a + ib$   
 Real part  $\rightarrow$   
 Imaginary part  $\rightarrow$   
**Conjugate of a complex number:** For a given complex number  $z = a + ib$ , its conjugate is defined as  $\bar{z} = a - ib$

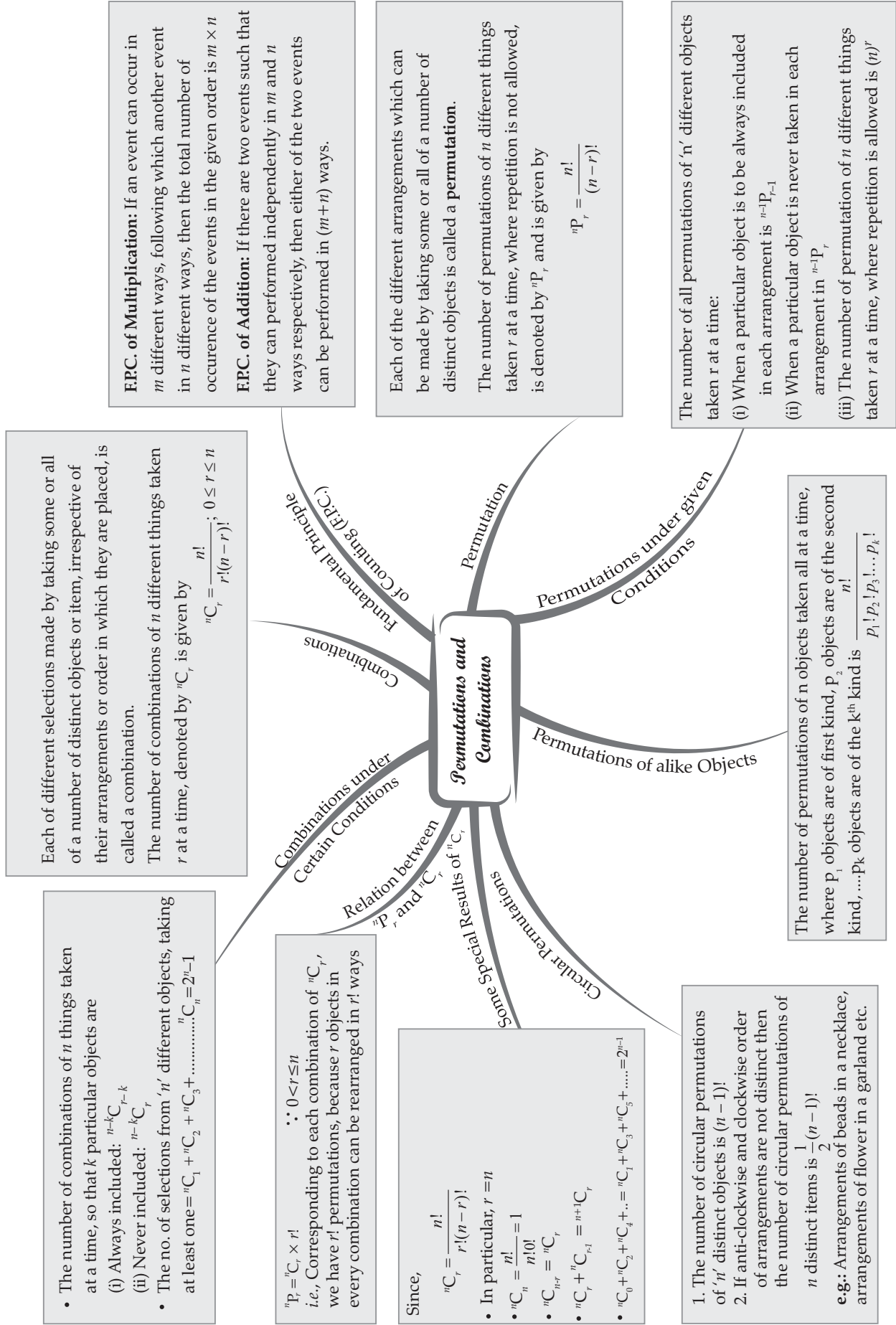
(i) if  $A = [a_{ij}]_{1 \times 1}$ , then  $|A| = a_{11}$   
 (ii) if  $A = \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}_{2 \times 2}$ , then  $|A| = a_{11} \cdot a_{22} - a_{12} \cdot a_{21}$   
 (iii) if  $A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}_{3 \times 3}$ , then  $|A| = a_{11}(a_{22} \cdot a_{33} - a_{23} \cdot a_{32}) - a_{12}(a_{21} \cdot a_{33} - a_{23} \cdot a_{31}) + a_{13}(a_{21} \cdot a_{32} - a_{22} \cdot a_{31})$   
 For eg. if  $A = \begin{bmatrix} 2 & 3 \\ 2 & 4 \end{bmatrix}$  then  $|A| = 2 \times 4 - 3 \times 2 = 2$

- Properties of  $|A|$**
- (i)  $|A|$  remains unchanged, if the rows and columns of  $A$  are interchanged i.e.,  $|A| = |A'|$
  - (ii) if any two rows (or columns) of  $A$  are interchanged, then the sign of  $|A|$  changes.
  - (iii) if any two rows (or columns) of  $A$  are identical, then  $|A| = 0$
  - (iv) if each element of a row (or a column) of  $A$  is multiplied by  $k$  (constant), then  $|A|$  gets multiplied by  $k^n$ .
  - (v) if  $A = [a_{ij}]_{3 \times 3}$ , then  $|k \cdot A| = k^3 |A|$ , where  $k$  is a constant.
  - (vi) if elements of a row or a column in a determinant  $|A|$  can be expressed as sum of two or more elements, then  $|A|$  can be expressed as  $|B| + |C|$ .
  - (vii) if  $R_i \rightarrow R_i + kR_j$  or  $C_i = C_i + kC_j$  in  $|A|$ , then the value of  $|A|$  remains same

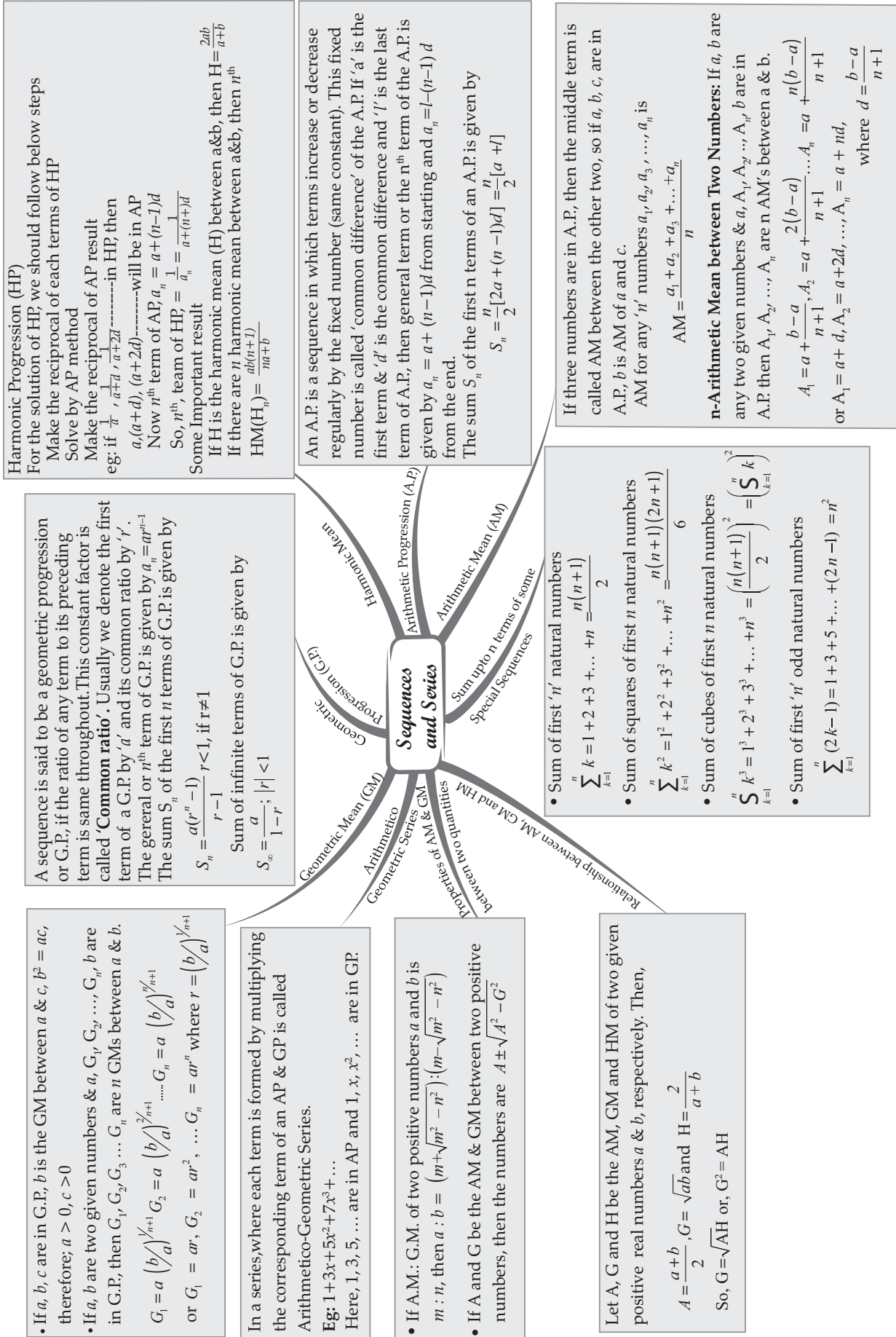


(i)  $A^{-1} = \frac{adj A}{|A|}$  where  $|A| \neq 0$  (ii)  $|A| = ad - bc$ , If  $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$   
 (iii)  $AA^{-1} = A^{-1}A = I$  (iv) Area of triangle,  $ABC A(x_1, y_1), B(x_2, y_2)$  and  $C(x_3, y_3)$  is given by  $\Delta = \frac{1}{2} \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$   
 (v) If matrix  $A = \begin{bmatrix} a_{11} & a_{12} & a_{13} \\ a_{21} & a_{22} & a_{23} \\ a_{31} & a_{32} & a_{33} \end{bmatrix}$  Then  $adj A = \begin{bmatrix} A_{11} & A_{21} & A_{31} \\ A_{12} & A_{22} & A_{32} \\ A_{13} & A_{23} & A_{33} \end{bmatrix}$  where  $A_{ij}$  is the cofactor of  $a_{ij}$   
 (vi) Suppose  $AX = B$  be the system of  $n$  non-homogeneous linear equations in  $n$  variables then  
 • If  $|A| \neq 0$ , then the system of equations is consistent and has a unique solution which is obtained as  $X = A^{-1}B$   
 • If  $|A| = 0$  and  $(adj)B = 0$ , then the system of equations is consistent and has infinitely many solutions.  
 (vii) Suppose  $AX = B$  be the system of  $n$  homogeneous linear equations in  $n$  variables then  
 • If  $|A| \neq 0$ , then it has only one solution  $X = 0$ , which is called as trivial solution.  
 • If  $|A| = 0$ , then the system has infinitely many solutions and is called non-trivial solutions.  
 (viii) If  $a_1x + b_1y = c_1$  and  $a_2x + b_2y = c_2$ , then  $x = \frac{D_1}{D}, y = \frac{D_2}{D}$ , where  $D \neq 0$   
 where  $D = \begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix}, D_1 = \begin{vmatrix} c_1 & b_1 \\ c_2 & b_2 \end{vmatrix}, D_2 = \begin{vmatrix} a_1 & c_1 \\ a_2 & c_2 \end{vmatrix}$   
 (ix) If  $a_1x + b_1y + c_1z = d_1, a_2x + b_2y + c_2z = d_2$  and  $a_3x + b_3y + c_3z = d_3$ , then  $x = \frac{D_1}{D}, y = \frac{D_2}{D}, z = \frac{D_3}{D}$ , where  $D \neq 0$   
 where  $D = \begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix}, D_1 = \begin{vmatrix} d_1 & b_1 & c_1 \\ d_2 & b_2 & c_2 \\ d_3 & b_3 & c_3 \end{vmatrix}, D_2 = \begin{vmatrix} a_1 & d_1 & c_1 \\ a_2 & d_2 & c_2 \\ a_3 & d_3 & c_3 \end{vmatrix}, D_3 = \begin{vmatrix} a_1 & b_1 & d_1 \\ a_2 & b_2 & d_2 \\ a_3 & b_3 & d_3 \end{vmatrix}$   
 (x) If  $A = \begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix}$  then  $|A| = a(ei - hf) - b(di - fg) + c(dh - ge)$

If  $(x_1, y_1), (x_2, y_2)$  and  $(x_3, y_3)$  are the vertices of triangle, then the area of  $\Delta = \frac{1}{2} \begin{vmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{vmatrix}$   
 For eg: if  $(1, 2), (3, 4)$  and  $(-2, 5)$  are the vertices, then the area of the triangle is  
 $\Delta = \frac{1}{2} \begin{vmatrix} 1 & 2 & 1 \\ 3 & 4 & 1 \\ -2 & 5 & 1 \end{vmatrix} = \frac{1}{2} |1(4-5) - 2(3+2) + 1(15+8)| = 6 \text{ sq. units.}$   
 we take positive value of the determinant because area is positive.







- When two lines are parallel their slopes are equal. Thus, any line parallel to  $y = mx + c$  is of the type  $y = mx + d$ , where  $d$  is any parameter
- Two lines  $ax + by + c = 0$  and  $a'x + b'y + c' = 0$  are parallel if  $\frac{a}{a'} = \frac{b}{b'} \neq \frac{c}{c'}$
- The distance between two parallel lines with equations  $ax + by + c_1 = 0$  and  $ax + by + c_2 = 0$  is  $d = \left| \frac{c_1 - c_2}{\sqrt{a^2 + b^2}} \right|$

The equation of bisectors of the angles between the lines  $a_1x + b_1y + c_1 = 0$  and  $a_2x + b_2y + c_2 = 0$  is given by 
$$\frac{a_1x + b_1y + c_1}{\sqrt{a_1^2 + b_1^2}} = \pm \sqrt{\frac{a_2^2 + b_2^2}{a_1^2 + b_1^2}}$$

- When two lines of the slope  $m_1$  &  $m_2$  are at right angles, the Product of their slope is  $-1$ , i.e.,  $m_1 m_2 = -1$ . Thus, any line perpendicular to  $y = mx + c$  is of the form  $y = -\frac{1}{m}x + d$  where  $d$  is any parameter.
- Two lines  $ax + by + c = 0$  and  $a'x + b'y + c' = 0$  are perpendicular if  $aa' + bb' = 0$ . Thus, any line perpendicular to  $ax + by + c = 0$  is of the form  $bx - ay + k = 0$ , where  $k$  is any parameter.

- The image of a point  $(x_1, y_1)$  about a line  $ax + by + c = 0$  is: 
$$[(ar + x_1), (br + y_1)]$$
 where,  $r = \frac{-2(ax_1 + by_1 + c)}{a^2 + b^2}$
- Perpendicular distance from a point  $(x_1, y_1)$  on the line  $ax + by + c = 0$  is: 
$$\frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$$
- The foot of  $\perp$  from a point  $(x_1, y_1)$  on the line  $ax + by + c = 0$  is: 
$$[(ar + x_1), (br + y_1)],$$
 where  $r = \frac{-(ax_1 + by_1 + c)}{a^2 + b^2}$

The length of the perpendicular from  $P(x_1, y_1)$  on  $ax + by + c = 0$  is: 
$$d = \frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$$

The point of intersection between the lines  $a_1x + b_1y + c_1 = 0$  and  $a_2x + b_2y + c_2 = 0$  is 
$$\left( \frac{a_1c_2 - b_2c_1}{a_1b_2 - a_2b_1}, \frac{c_1a_2 - c_2a_1}{a_1b_2 - a_2b_1} \right)$$

If  $m_1$  and  $m_2$  are the slopes of two intersecting lines ( $m_1 m_2 \neq -1$ ) and  $\theta$  be the acute angle between them then  $\tan \theta = \left| \frac{m_1 - m_2}{1 + m_1 m_2} \right|$

Angle between two straight lines in terms of their slopes

Slope Formula

Area of Triangle

Distance Formula

- If  $\theta$  is the angle at which a straight line is inclined to be +ve direction of x-axis and  $0^\circ \leq \theta < 180^\circ$ ,  $\theta \neq 90^\circ$ , then the slope of the line, denoted by  $m$ , is defined by  $m = \tan \theta$ . If  $\theta$  is  $90^\circ$ ,  $m$  doesn't exist, but the line is parallel to y-axis. If  $\theta = 0^\circ$ , then  $m = 0$  and the line is parallel to x-axis.
- If  $A(x_1, y_1)$  and  $B(x_2, y_2)$ ,  $x_1 \neq x_2$  are points on straight line, then the slope  $m$  of the line is given by  $m = \frac{(y_1 - y_2)}{(x_1 - x_2)}$

Area of triangle whose vertices are  $(x_1, y_1)$ ,  $(x_2, y_2)$  and  $(x_3, y_3)$  is  $\frac{1}{2} |x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)|$

The distance between the points  $A(x_1, y_1)$  and  $B(x_2, y_2)$  is 
$$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

The P(x, y) divided the line joining  $A(x_1, y_1)$  and  $B(x_2, y_2)$  in the ratio  $m:n$ , then  $x = \frac{mx_2 \pm nx_1}{m \pm n}$ ;  $y_1 = \frac{my_2 \pm ny_1}{m \pm n}$

**Note:** • (+ve) sign tells the division is internal, but (-ve) signs tells, the division is external.

- If  $m = n$ , then P is the mid-point of the line segment joining A & B.

- POINT-SLOPE FORM:**  $y - y_1 = m(x - x_1)$  is the equation of a straight line whose slope is 'm' and passes through the point  $(x_1, y_1)$ .
- SLOPE INTERCEPT FORM:**  $y = mx + c$  is the equation of a straight line whose slope is 'm' and makes an intercept 'c' on the y-axis.
- TWO POINT FORM:**  $y - y_1 = \frac{y_2 - y_1}{x_2 - x_1} (x - x_1)$  is the equation of a straight line which passes through  $(x_1, y_1)$  &  $(x_2, y_2)$ .
- INTERCEPT FORM:**  $\frac{x}{a} + \frac{y}{b} = 1$  is the equation of a straight line which makes intercepts  $a$  &  $b$  on x and y axis respectively.
- NORMAL / PERPENDICULAR FORM:**  $x \cos \alpha + y \sin \alpha = p$  (where  $p > 0$ ,  $0 \leq \alpha < 2\pi$ ) is the equation of a straight line where the length of the perpendicular from origin O on the line is  $p$  and this perpendicular makes an angle  $\alpha$  with +ve x-axis.
- GENERAL FORM:**  $ax + by + c = 0$  is the equation of a straight line in general form. In this case, slope of line =  $-\frac{a}{b}$

**Lines**

Equation of Straight Line in various forms

Intersection Point

Length of the perpendicular from a point on a line

Reflection & foot of perpendicular

Perpendicular lines

Equations of bisectors

Parallel lines

Angle between two straight lines in terms of their slopes

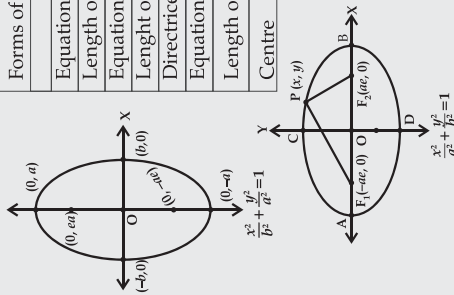
Slope Formula

Area of Triangle

Distance Formula

- An ellipse is the set of all points in a plane, that the sum of their distances from two fixed points in the plane is constant.
- The two fixed points are called the 'foci' of the ellipse.
- The mid-point of line segment joining foci is called the 'centre' of the ellipse.
- The line segment through the foci of the ellipse is called 'major axis'.
- The line segment through centre & perpendicular to major axis is called minor axis.

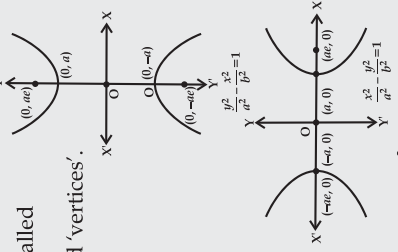
Forms of ellipse	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$
Equation of major axis	$a > b$
Equation of minor axis	$y=0$
Length of major axis	$2a$
Equation of Minor axis	$x=0$
Length of Minor axis	$2b$
Directrices	$x = \pm \frac{a}{e}$
Equation of latus rectum	$x = \pm ae$
Length of latus rectum	$\frac{2b^2}{a}$
Centre	$(0, 0)$



Here,  $a > b$  and  $b^2 = a^2(1 - e^2)$ ,  $e < 1$

- A hyperbola is the set of all points in a plane, that the difference of whose distances from two fixed points in the plane is a constant.
- The two fixed points are called the 'foci' of the hyperbola.
- The mid-point of the line segment joining the foci is called the 'centre' of the hyperbola.
- The line through the foci is called 'transverse axis'.
- Line through centre and perpendicular to transverse axis is called 'conjugate axis'.
- Points at which hyperbola intersects transverse axis are called 'vertices'.

Forms of the hyperbola	$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$
Equation of transverse axis	$y=0$
Equation of conjugate axis	$x=0$
Length of transverse axis	$2a$
Foci	$(\pm ae, 0)$
Equation of latus rectum	$x = \pm ae$
Length of latus rectum	$\frac{2b^2}{a}$
Centre	$(0, 0)$

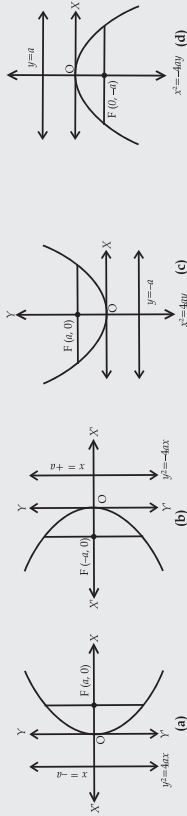


Here,  $b^2 = a^2(e^2 - 1)$ ,  $e > 1$

- A parabola is the set of all points in a plane that are equidistant from a fixed line and a fixed point in the plane. Fixed line is called 'directrix' of parabola. Fixed point F is called the 'focus'. A line through focus & perpendicular to directrix is called 'axis'. Point of intersection of parabola with axis is called 'vertex'.

**Main facts about the parabola**

Forms of Parabolas	$y^2 = 4ax$	$y^2 = -4ax$	$x^2 = 4ay$	$x^2 = -4ay$
Axis	$y = 0$	$y = 0$	$x = 0$	$x = 0$
Directrix	$x = -a$	$x = a$	$y = -a$	$y = a$
Vertex	$(0, 0)$	$(0, 0)$	$(0, 0)$	$(0, 0)$
Focus	$(a, 0)$	$(-a, 0)$	$(0, a)$	$(0, -a)$
Length of latus rectum	$4a$	$4a$	$4a$	$4a$
Equations of latus rectum	$x = a$	$x = -a$	$y = a$	$y = -a$

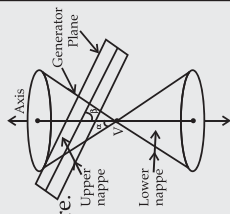


**Conic Sections**

**Definition**

Circles, ellipses, parabolas and hyperbolas are known as conic sections because they can be obtained as intersections of plane with a double napped right circular cone  $\alpha$ . From the given figure:

- (i) Section will represent circle, if  $\beta = 90^\circ$
- (ii) Section will represent an Ellipse, if  $\alpha < \beta < \pi/2$
- (iii) Section will represent a parabola if  $\alpha = \beta$
- (iv) Section will represent a hyperbola if  $0 \leq \beta < \alpha$



**Circle**

A circle is a set of all points in a plane that are equidistant from a fixed point in the plane. The fixed point is called the 'centre' of the circle and the distance from the centre to a point on the circle is called the 'radius' of the circle.

The equation of a circle with centre  $(h, k)$  and the radius  $r$  is

$$(x-h)^2 + (y-k)^2 = r^2$$

The general equation of circle is  $x^2 + y^2 + 2gx + 2fy + c = 0$

its centre is  $(-g, -f)$  and radius  $r = \sqrt{g^2 + f^2 - c}$

### Three Dimensional Geometry-I

Introduction

Distance between Two Points

Coordinates of the Centroid of a Triangle

Coordinates of a Midpoint

The coordinates of the centroid of the triangle, whose vertices are  $(x_1, y_1, z_1)$ ,  $(x_2, y_2, z_2)$  and  $(x_3, y_3, z_3)$  are  $\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}, \frac{z_1 + z_2 + z_3}{3}\right)$ .

**e.g.:** The centroid of a triangle ABC is at the point  $(1, 1, 1)$ . If the coordinates of A and B are  $(3, -5, 7)$  and  $(-1, 7, -6)$ , respectively, find the coordinates of the point C.

**Sol:** Let the coordinates of C be  $(x, y, z)$  and the coordinates of the centroid G be  $(1, 1, 1)$ . Then  $\frac{x+3-1}{3} = 1, \text{ i.e., } x = 1;$

$$\frac{y-5+7}{3} = 1, \text{ i.e., } y = 1;$$

$$\frac{z+7-6}{3} = 1, \text{ i.e., } z = 2. \text{ So, } C(x, y, z) = (1, 1, 2)$$

### Section Formula

The coordinates of the point R which divides the line segment joining two points  $P(x_1, y_1, z_1)$  and  $Q(x_2, y_2, z_2)$  internally and externally in the ratio  $m : n$  are given by

$$\left(\frac{mx_2 + nx_1}{m+n}, \frac{my_2 + ny_1}{m+n}, \frac{mz_2 + nz_1}{m+n}\right) \quad \& \quad \left(\frac{mx_2 - nx_1}{m-n}, \frac{my_2 - ny_1}{m-n}, \frac{mz_2 - nz_1}{m-n}\right)$$

respectively.

**e.g.:** Find the coordinates of the point which divides the line segment joining the points  $(1, -2, 3)$  and  $(3, 4, -5)$  in the ratio  $2 : 3$  internally.

**Sol:** Let  $P(x, y, z)$  be the point which divides line segment joining A  $(1, -2, 3)$  and B  $(3, 4, -5)$  internally in the ratio  $2 : 3$ . Therefore,

$$x = \frac{2(3) + 3(1)}{2+3} = \frac{9}{5} \quad y = \frac{2(4) + 3(-2)}{2+3} = \frac{2}{5} \quad z = \frac{2(-5) + 3(3)}{2+3} = \frac{-1}{5}$$

Thus, the required point is  $\left(\frac{9}{5}, \frac{2}{5}, \frac{-1}{5}\right)$ .

The coordinates of the midpoint of the line segment joining two points  $P(x_1, y_1, z_1)$  and  $Q(x_2, y_2, z_2)$  are  $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}, \frac{z_1 + z_2}{2}\right)$ .

**e.g.:** Find the midpoint of the line joining two points  $P(1, -3, 4)$  and  $Q(-4, 1, 2)$ .

**Sol:** Coordinates of the midpoint of the line joining the points P & Q are  $\left(\frac{1-4}{2}, \frac{-3+1}{2}, \frac{4+2}{2}\right)$  i.e.  $\left(\frac{-3}{2}, -1, 3\right)$

- In three dimensions, the coordinate axes of a rectangular cartesian coordinate system are three mutually perpendicular lines. The axes are called  $x, y$  and  $z$ -axes.
- The three planes determined by the pair of axes are the coordinate planes, called  $xy, yz$  and  $zx$ -planes.
- The three coordinate planes divide the space into eight parts known as octants.

The coordinates of a point P in 3D Geometry is always written in the form of triplet like  $(x, y, z)$ . Here,  $x, y$  and  $z$  are the distances from  $yz, zx$  and  $yx$  planes, respectively.

- e.g.:**
- Any point on  $x$ -axis is :  $(x, 0, 0)$
  - Any point on  $y$ -axis is :  $(0, y, 0)$
  - Any point on  $z$ -axis is :  $(0, 0, z)$

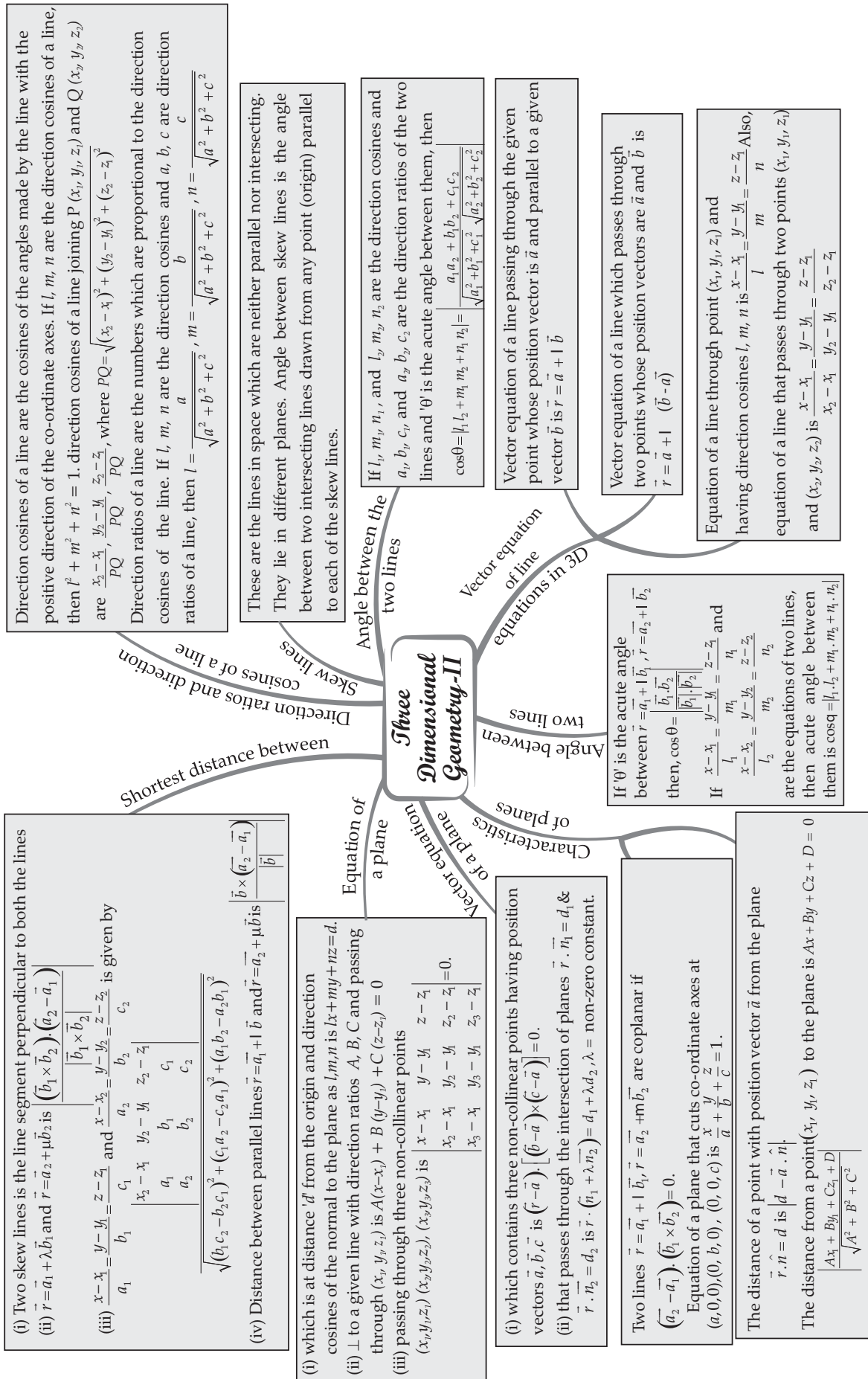
Distance between two points  $P(x_1, y_1, z_1)$  and  $Q(x_2, y_2, z_2)$  is given by

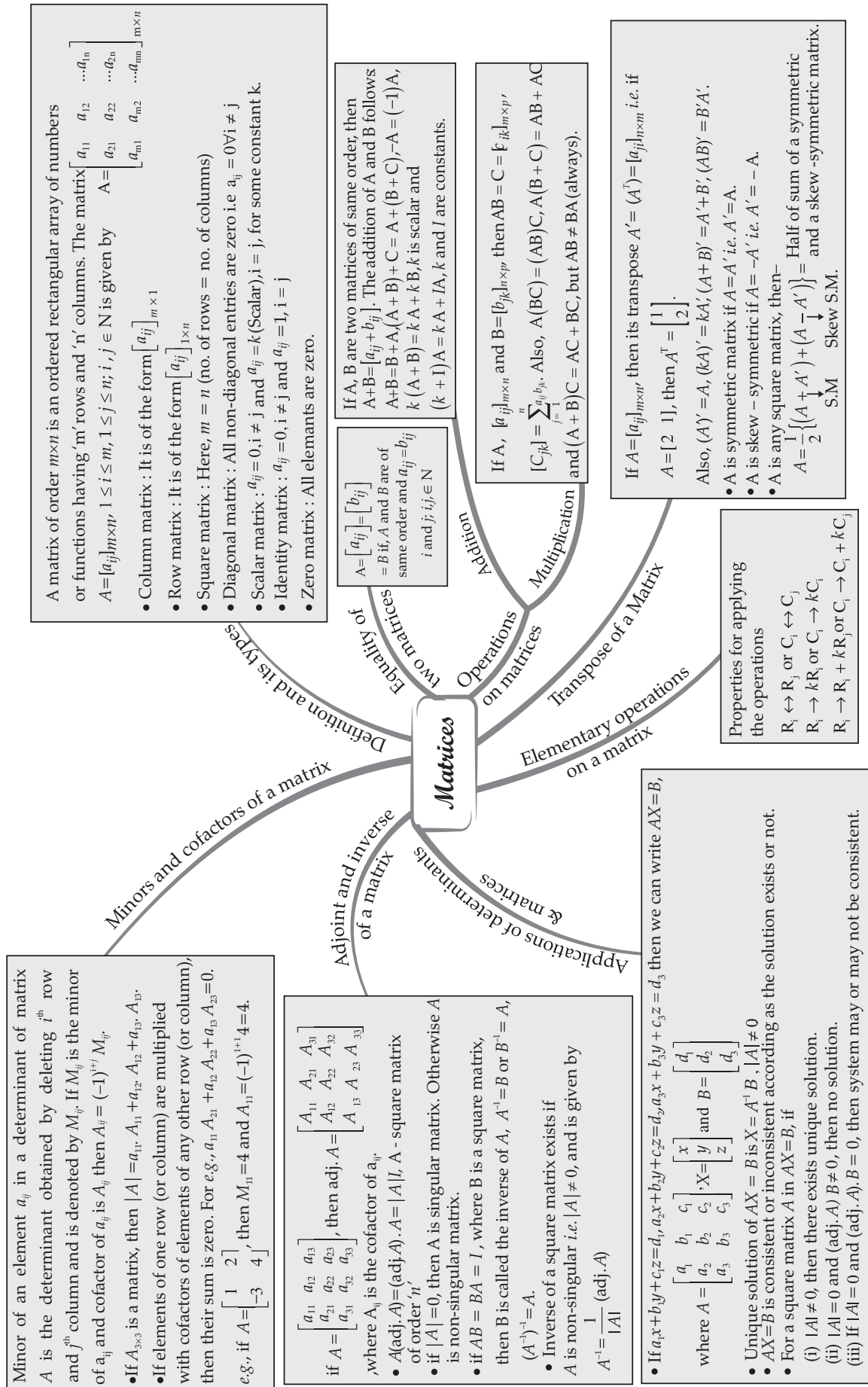
$$PQ = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

**e.g.:** Find the distance between the points  $P(1, -3, 4)$  and  $(-4, 1, 2)$ .

**Sol:** The distance PQ between the points P & Q is given by

$$PQ = \sqrt{(-4-1)^2 + (1+3)^2 + (2-4)^2} \\ = \sqrt{25+16+4} = \sqrt{45} = 3\sqrt{5} \text{ units}$$





An Experiment is called random experiment if it satisfies the following two conditions:

- It has more than one possible outcome.
- It is not possible to predict the outcome in advance.

**Outcome:** A possible result of a random experiment is called its outcome.

**Sample Space:** Set of all possible outcomes of a random experiment is called sample space. It is denoted by symbol 'S'.  
e.g.: In a toss of a coin, sample space is Head & Tail. i.e.,  $S = \{H, T\}$

**Sample Point:** Each element of the Sample Space is called a sample point.  
e.g.: In a toss of a coin, head is a sample point

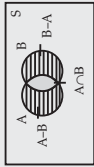
**Equally Likely Outcomes:** All outcomes with equal probability.

If A and B are any two events, then

- $P(A \cup B) = P(A) + P(B) - P(A \cap B)$
- $P(A \cap B) = P(A) + P(B) - P(A \cup B)$

If A and B are mutually exclusive, then  $P(A \cup B) = P(A) + P(B)$   
(As  $P(A \cap B) = \phi$ )

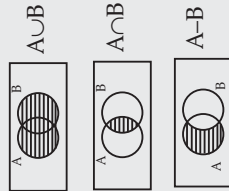
- Probability of the event 'not A'  
 $P(A') = P(\text{not } A) = 1 - P(A)$



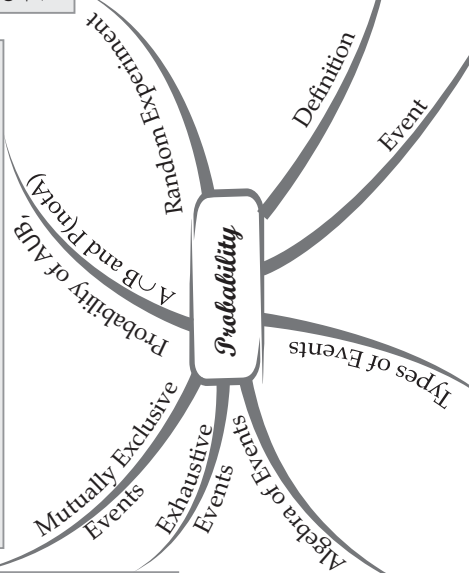
Events A & B are called mutually exclusive events if occurrence of any one of them excludes occurrence of other event, i.e. they cannot occur simultaneously.  
e.g.: A die is thrown. Event A = All even outcomes & event B = All odd outcomes. then, A & B are mutually exclusive events, they cannot occur simultaneously.  
**Note:** Simple events of a sample space are always mutually exclusive.

Many events that together form sample space are called exhaustive events.  
e.g.: A die is thrown. Event A = All even outcomes and event B = All odd outcomes.  
Event A & B together forms exhaustive events as it forms sample space.

- Event A or B or  $(A \cup B)$   
 $A \cup B = \{w : w \in A \text{ or } w \in B\}$
- Event A and B or  $(A \cap B)$   
 $A \cap B = \{w : w \in A \text{ and } w \in B\}$
- Event A but not B or  $(A - B)$   
 $A - B = A \cap B'$



- **Impossible and Sure Event:** The empty set  $\phi$  is called an Impossible event, whereas the whole sample space 'S' is called 'Sure event'.  
e.g.: In a rolling of a die, impossible event is getting number more than 6 and event of getting number less than or equal to 6 is sure event.
- **Simple Event:** If an event has only one sample point of a sample space, it is called a 'simple event'.  
e.g.: In rolling of a die, simple event could be the event of getting number 4.
- **Compound Event:** If an event has more than one sample point, it is called a 'compound event'.  
e.g.: In rolling of a die, compound event could be event of getting an even number.
- **Complementary Event:** Complement event to A = 'not A'  
e.g.: If an event A = Event of getting odd number in a throw of a die i.e.,  $\{1, 3, 5\}$  then, complementary event to A = Event of getting an even number in a throw of a die, i.e.  $\{2, 4, 6\}$   
 $A' = \{w : w \in S \text{ and } w \notin A\} = S - A$  (where S is the sample space)



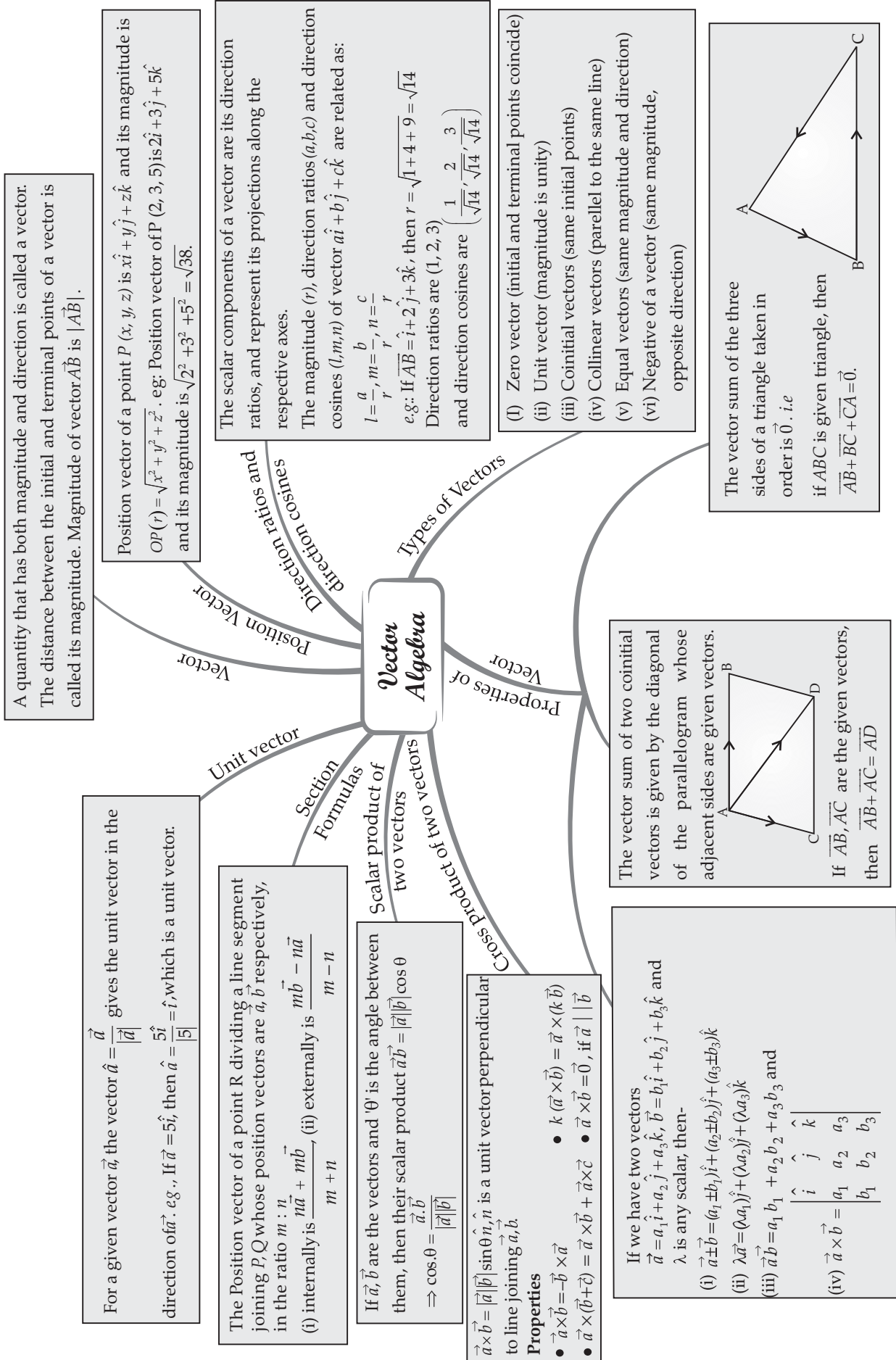
Probability is the measure of uncertainty of various phenomenon, numerically. It can have positive value from 0 to 1.

Probability =  $\frac{\text{No. of favourable outcome}}{\text{Total no. of outcomes}}$

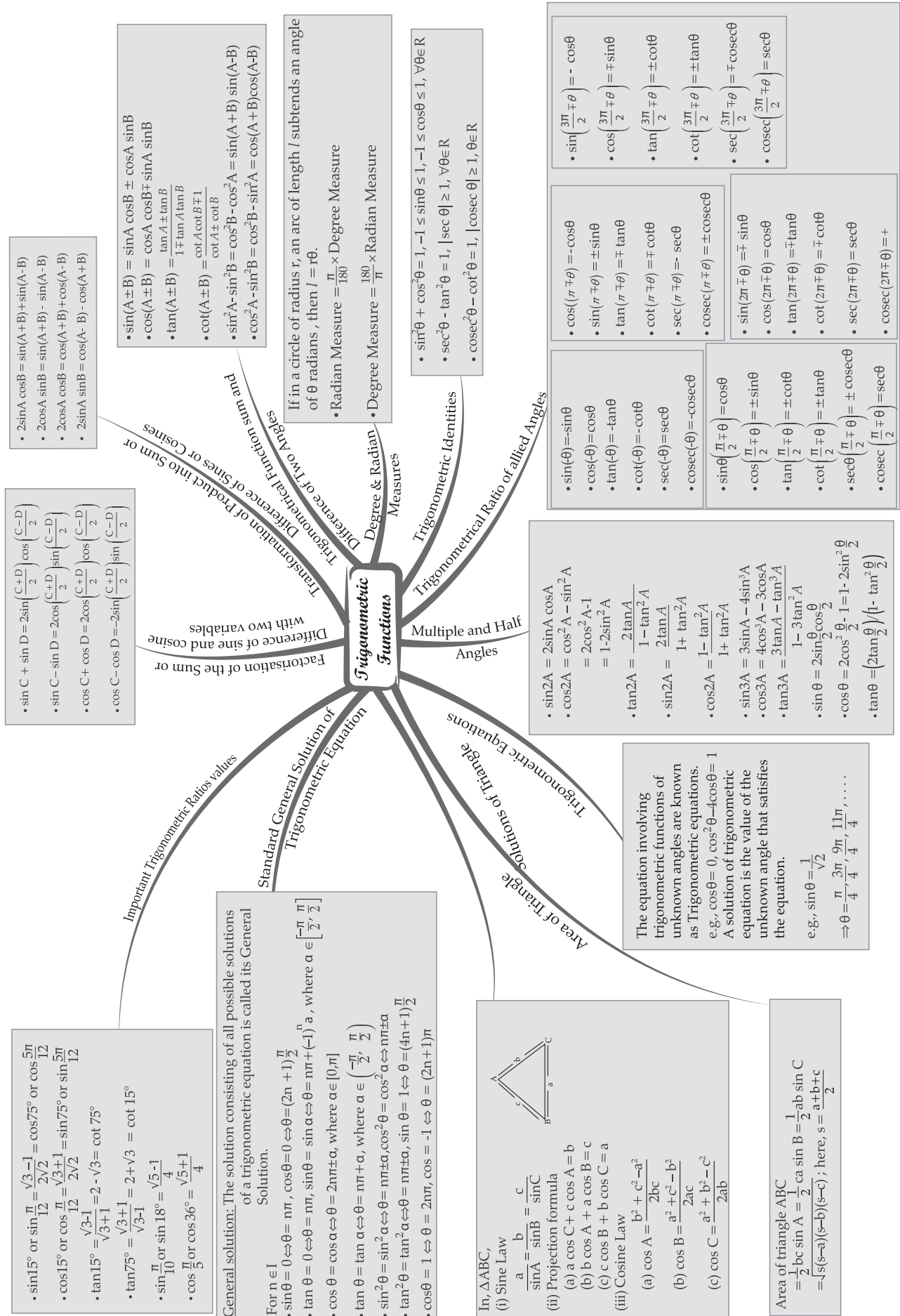
e.g.: Probability of getting an even no. in a throw of a die.  
**Sol.** Here, favourable outcomes =  $\{2, 4, 6\}$   
Total no. of outcomes =  $\{1, 2, 3, 4, 5, 6\}$   
Probability =  $\frac{3}{6} = \frac{1}{2}$

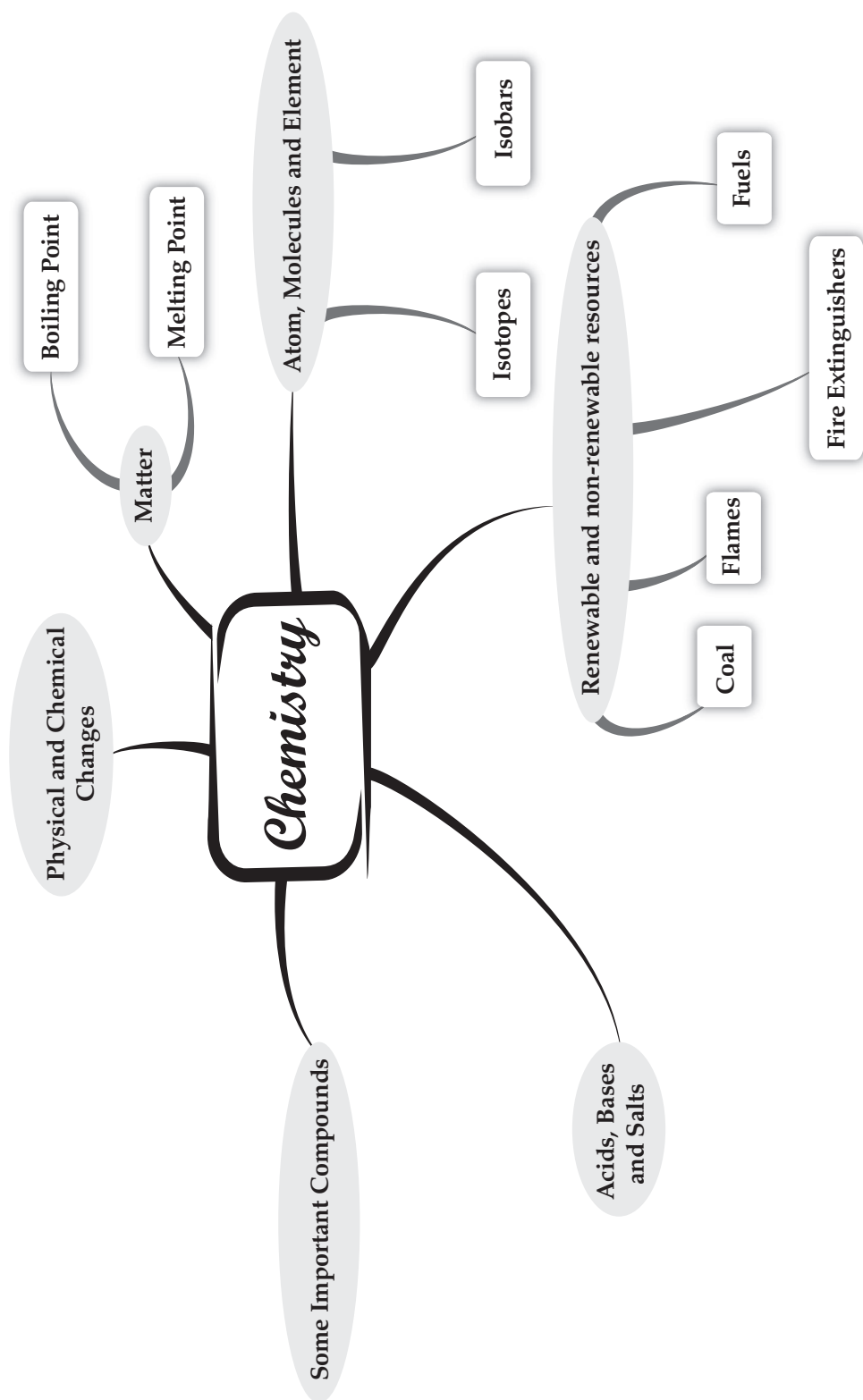
It is the set of favourable outcomes. Any subset E of a sample space S is called an event.  
e.g.: Event of getting an even number (outcome) in a throw of a die.

**Occurrence of event:** The event E of a sample space 'S' is said to have occurred if the outcome w of the experiment is such that  $w \in E$ . If the outcome w is such that  $w \notin E$ , we say that event E has not occurred.



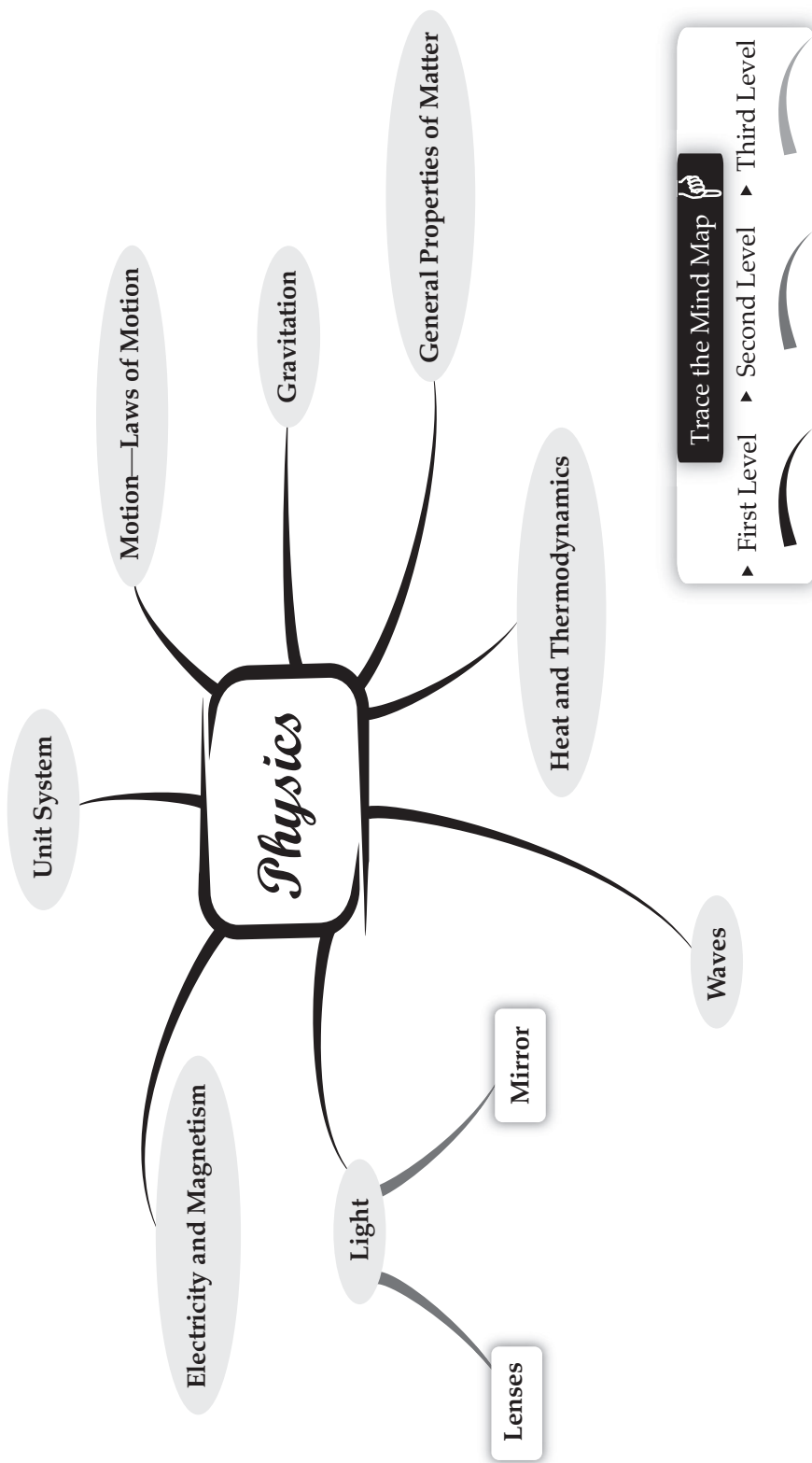


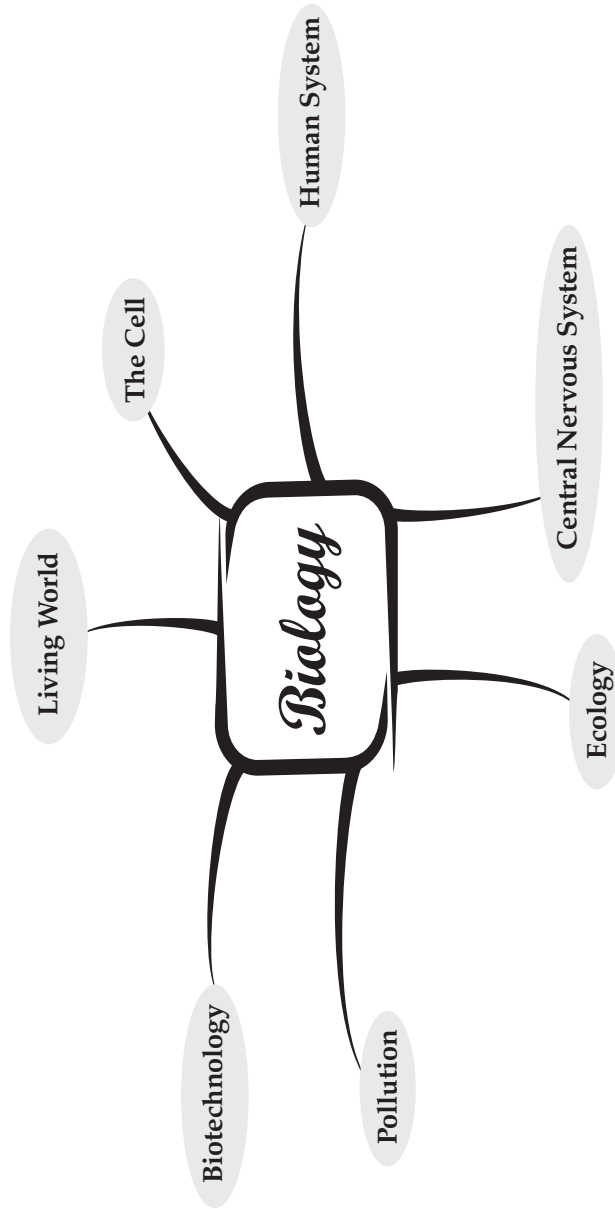




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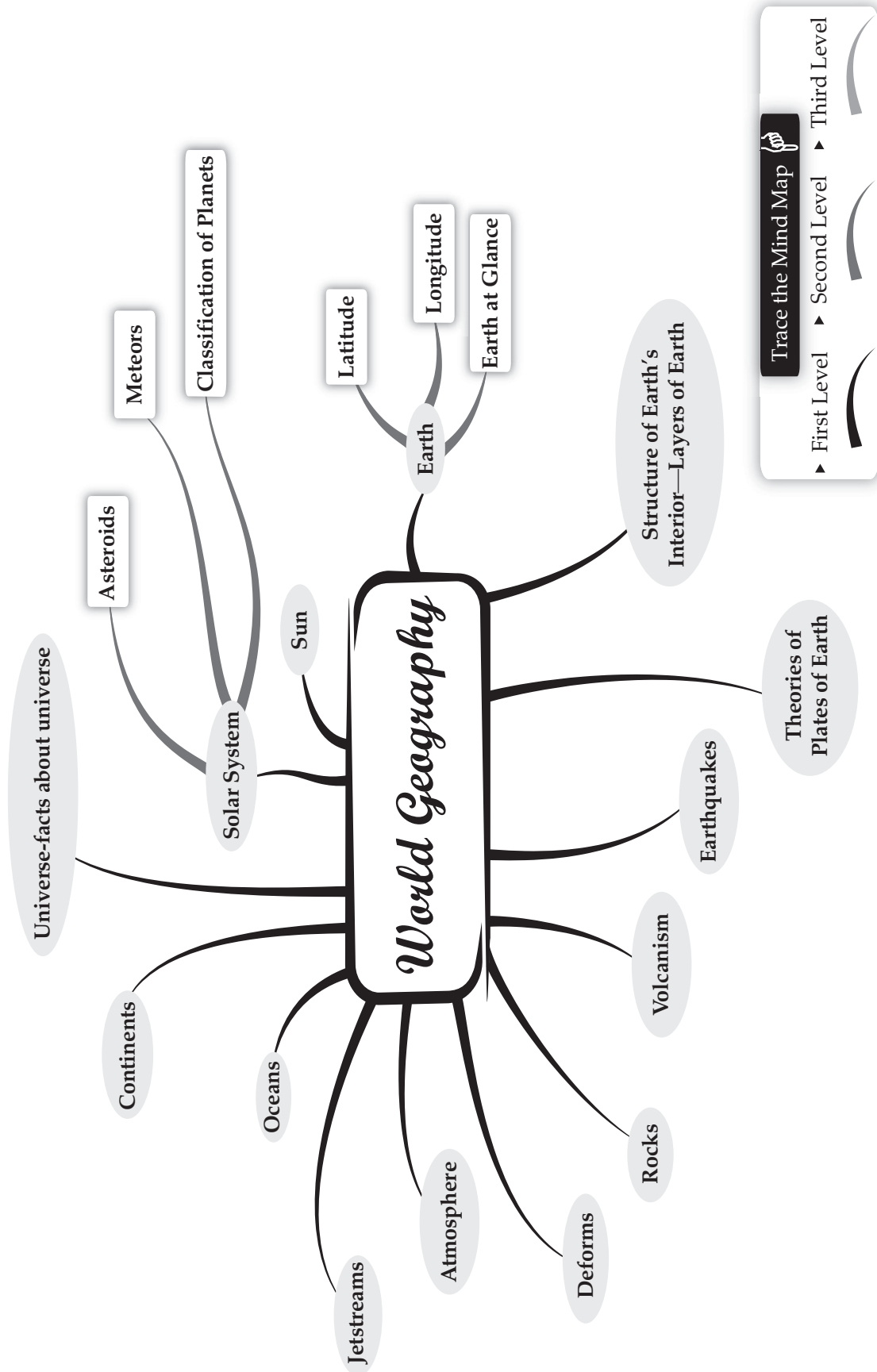




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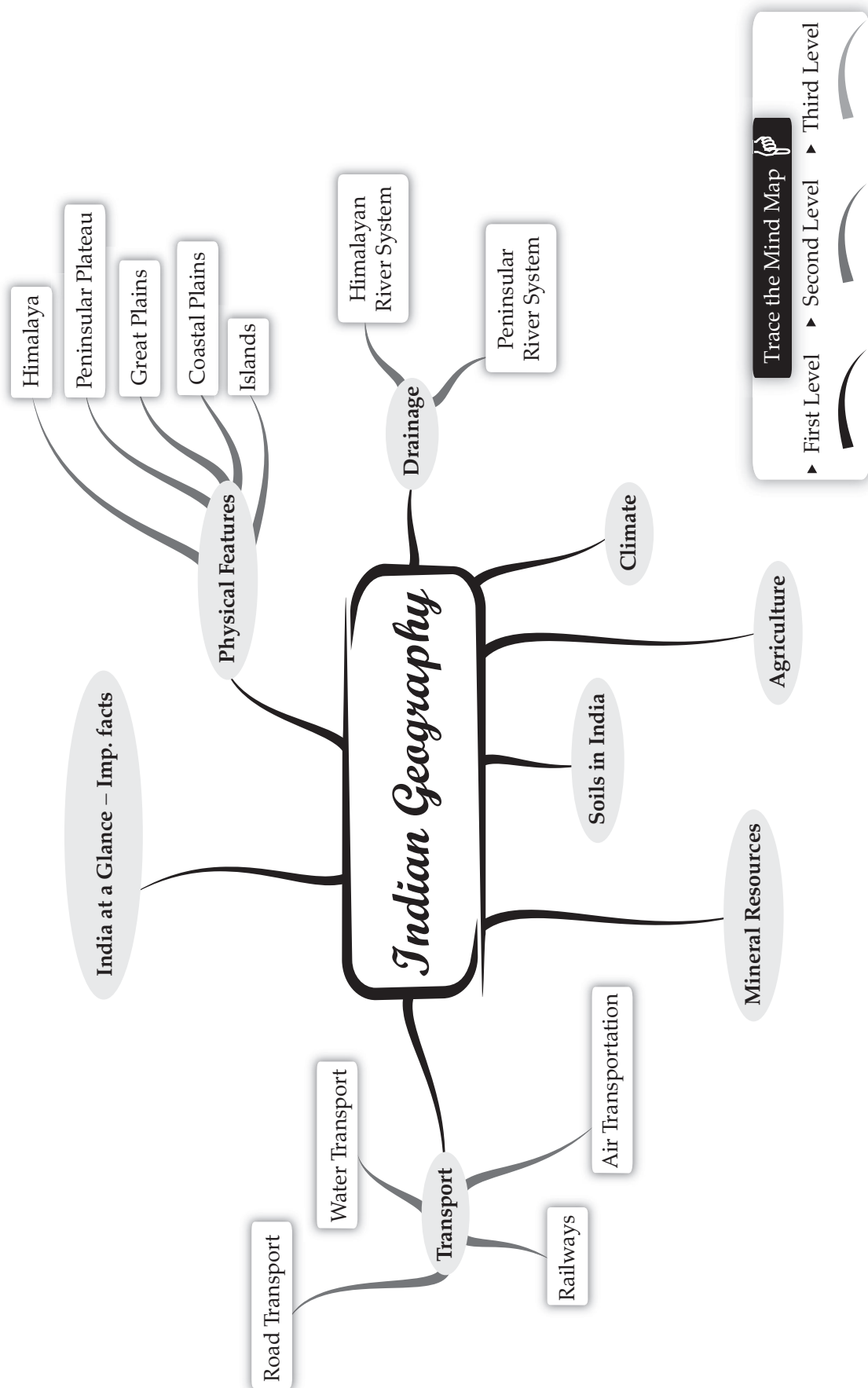
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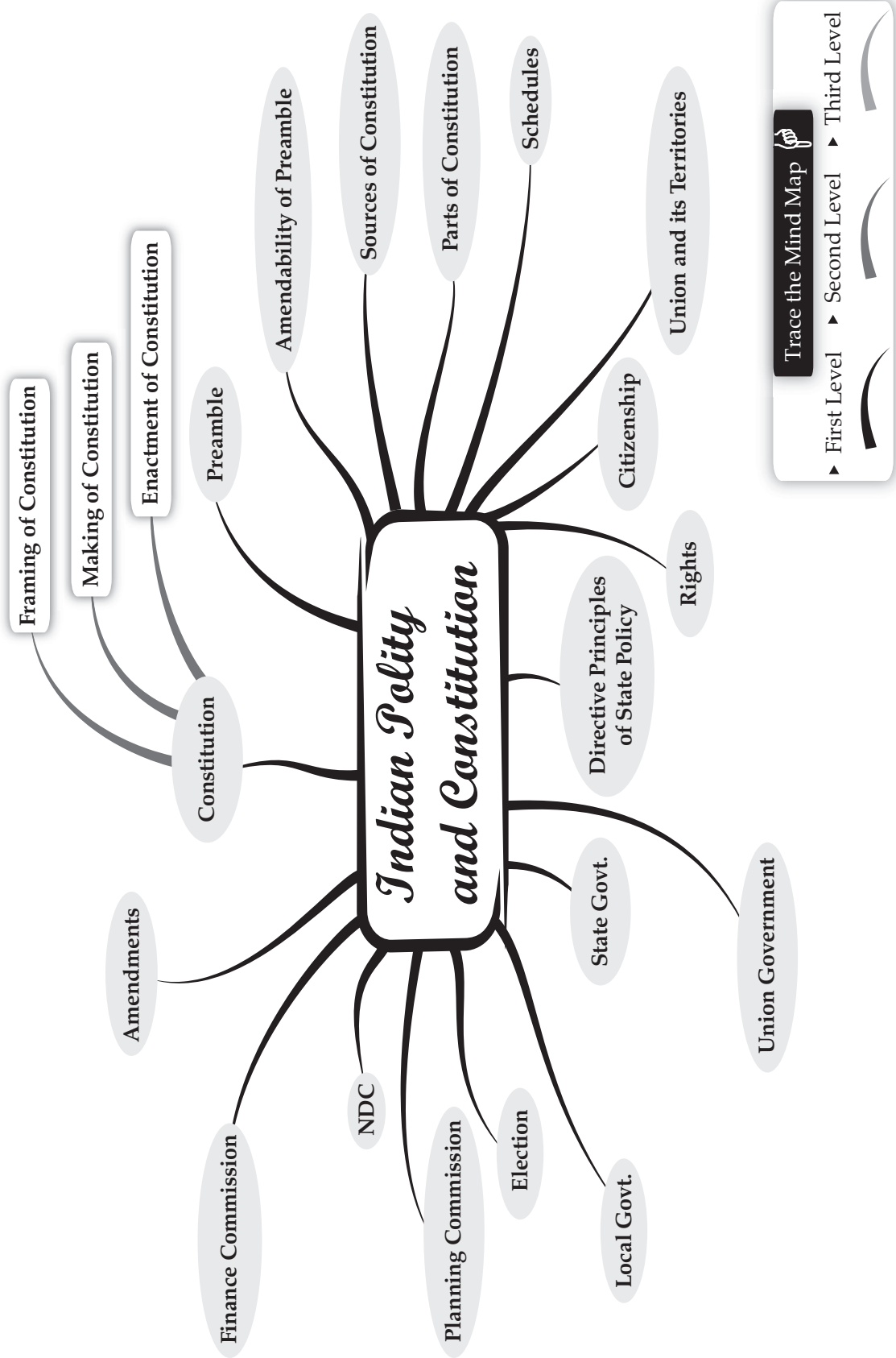
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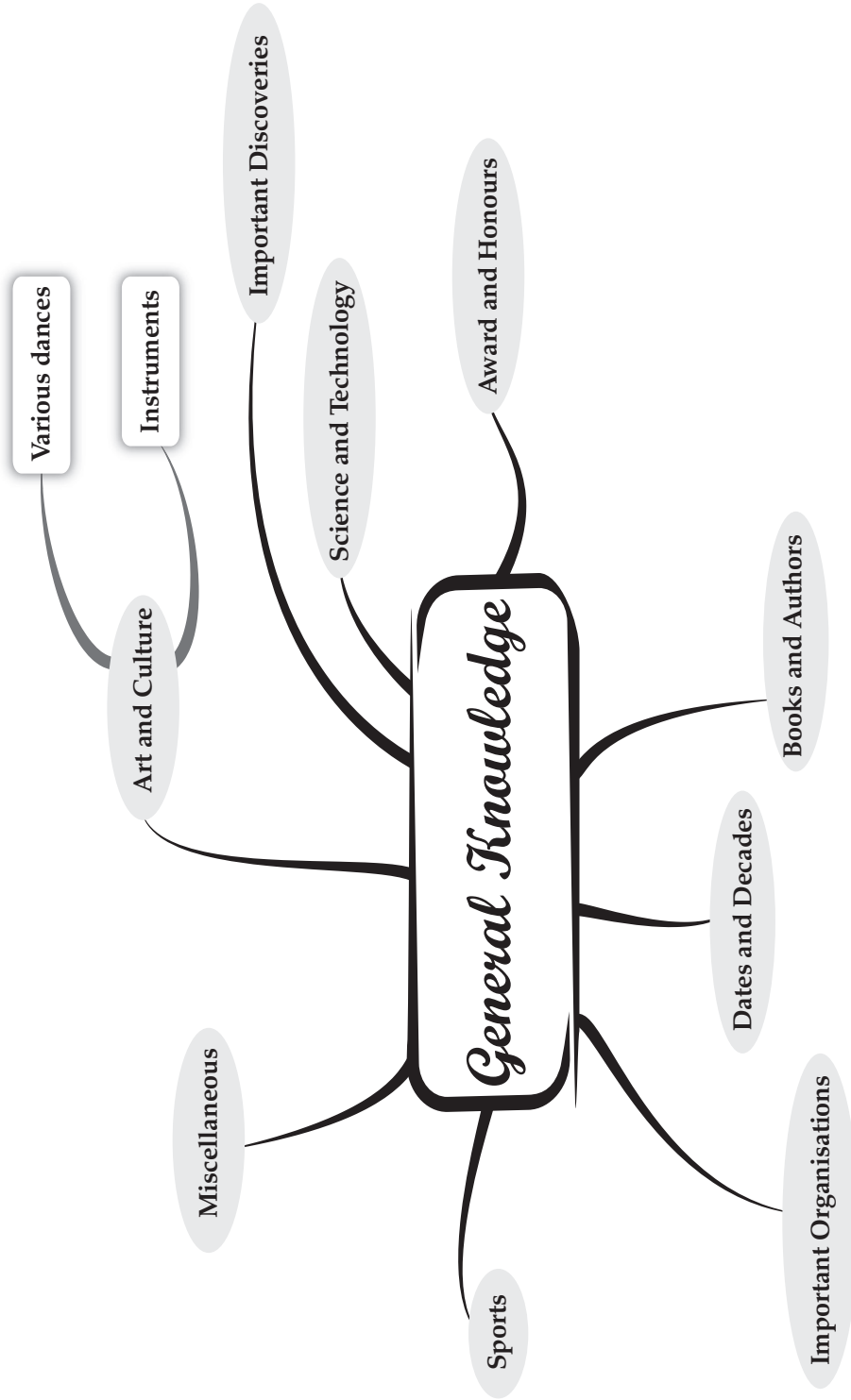
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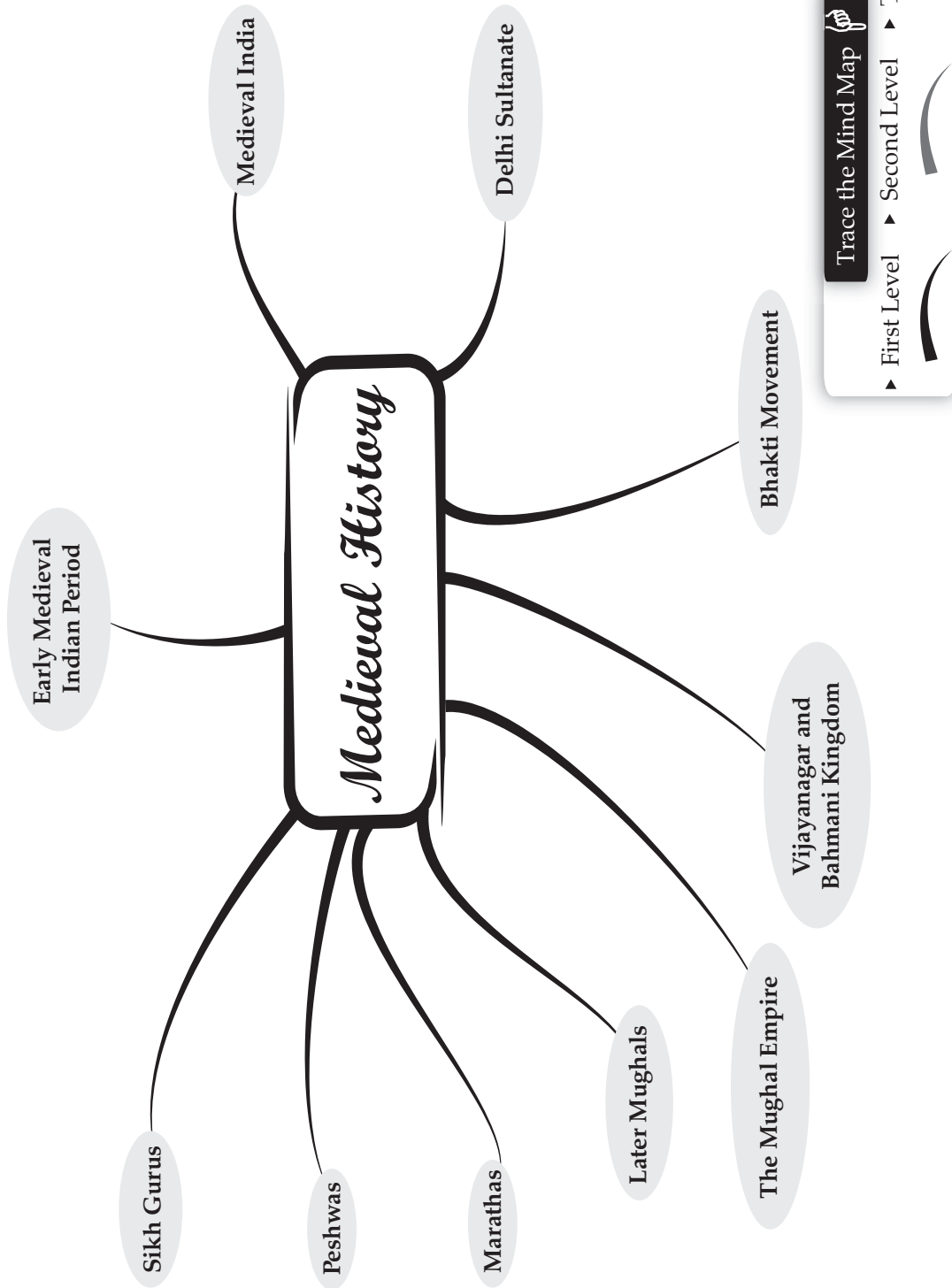


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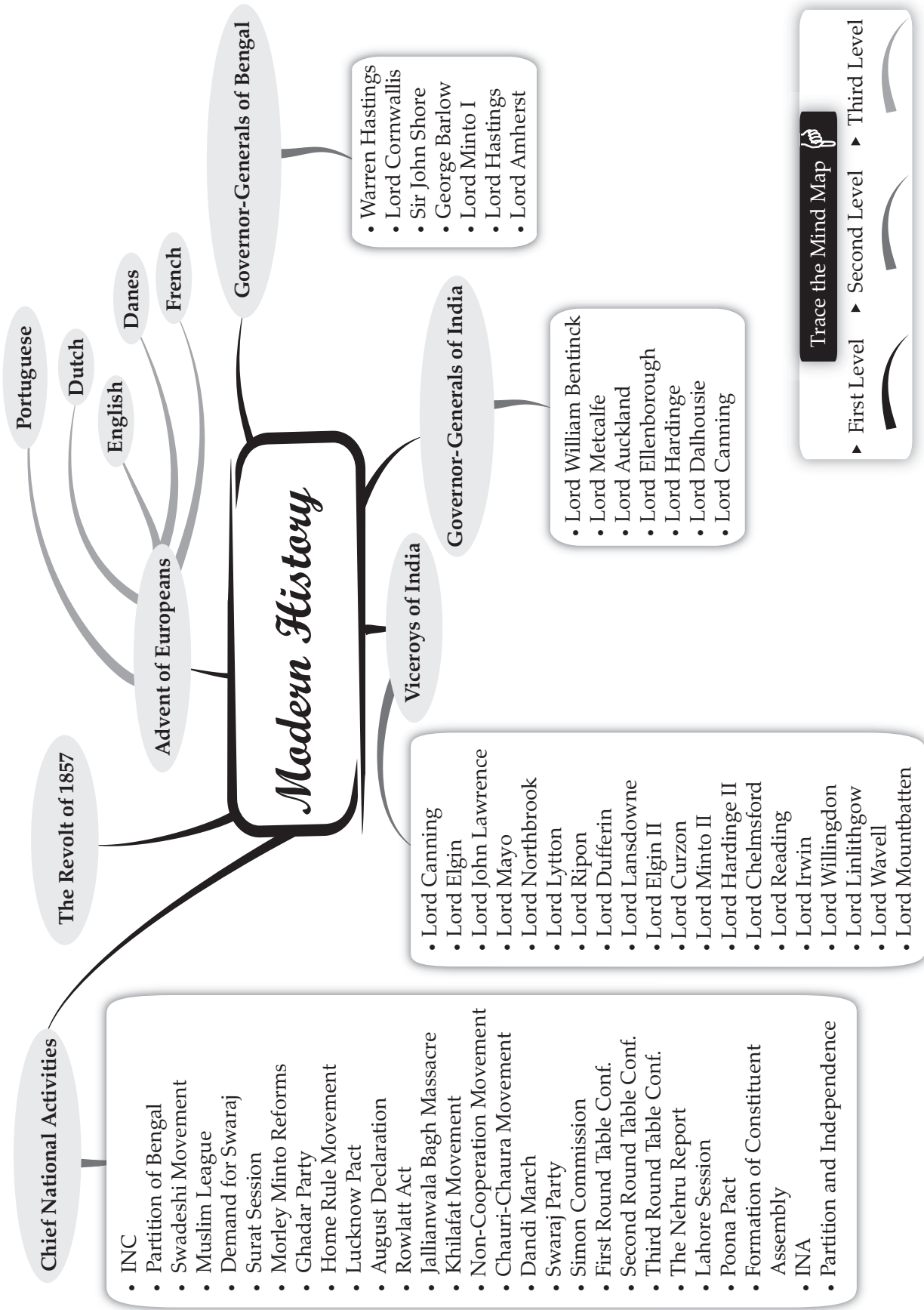




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**SYNONYMS**

- Synonyms are words that are similar, or have a related meaning, to another word.

A synonym is a word or phrase that means exactly or nearly the same as another word or phrase in the same language. For example, the words begin, start, commence, and initiate are all synonyms of one another; they are synonymous.

**Some common synonyms are:**

Smart – Clever, Important – Essential, Good – Excellent, Stupid – Dumb, Irrelevant – Useless, Complete – Perfect, Bad – Inferior, Interesting – Fascinating, Exact – Specific, Awful – Horrible, Commonplace – Boring, Suitable – Uniform

**List of Synonyms**

- **Anger** – enrage, infuriate, annoy, exasperate, madden
- **Angry** – enraged, wrathful, indignant, exasperated, aroused
- **Amazing** – incredible, improbable, fabulous, astonishing, astounding, extraordinary
- **Ask** – seek information from, put a question to, demand, request, expect, interrogate
- **Begin** – launch, initiate, commence, inaugurate, originate
- **Big** – enormous, immense, gigantic, colossal, ample
- **Bossy** – controlling, tyrannical, domineering, autocratic, high-handed
- **Brave** – dauntless, intrepid, plucky, doughty, mettlesome
- **Break** – fracture, rupture, shatter, smash, wreck, crash, demolish, atomise
- **Calm** – tranquil, mild, level-headed, unexcited, aloof
- **Come** – approach, advance, near, arrive, reach
- **Cool** – chilly, frosty, wintry, icy, frigid
- **Definite** – certain, sure, positive, determined, obvious
- **Delicious** – luscious, scrumptious, palatable, toothsome, exquisite
- **Describe** – portray, narrate, relate, represent, record
- **End** – terminate, conclude, halt, cessation, discontinuance
- **Enjoy** – delight in, be pleased, indulge in, luxuriate in, bask in, relish
- **Explain** – elaborate, clarify, interpret, justify, account for
- **Fall** – drop, descend, plunge, topple, tumble
- **False** – fraudulent, spurious, unfounded, deceptive, groundless
- **Fair** – just, objective, impartial, unbiased, open minded
- **Famous** – renowned, celebrated, eminent, illustrious, notorious
- **Good** – marvellous, pleasant, reliable, genuine, beneficial
- **Great** – noteworthy, worthy, distinguished, remarkable, mighty
- **Happy** – contented, delighted, gratified, blissful, overjoyed
- **Hardworking** – diligent, determined, industrious, enterprising, persevering
- **Hate** – despise, loathe, detest, abhor, abominate
- **Hurry** – run, speed, race, hasten, urge, accelerate, bustle
- **Interesting** – intriguing, provocative, titillating, tantalizing, absorbing
- **Introverted** – shy, bashful, quiet, withdrawn, introspective
- **Keep** – retain, withhold, preserve, sustain, sustenance
- **Kill** – slay, assassinate, murder, destroy, abolish
- **Kind** – thoughtful, considerate, amiable, gracious, tender
- **Lucky** – auspicious, fortunate, privileged, blessed, charmed
- **Make** – originate, invent, manufacture, develop, execute
- **Mark** – label, tag, trace, imprint, stamp
- **Mean** – unfriendly, unpleasant, badtempered, difficult
- **Mischievous** – prankish, playful, naughty, roguish, impish, sportive
- **Outgoing** – friendly, sociable, warm, extrovert
- **Pacify** – appease, placate, compose, abate, mitigate
- **Plan** – plot, design, device, contrivance, blueprint
- **Popular** – well-liked, approved, favourite, celebrated, current
- **Positive** – optimistic, cheerful, starryeyed, sanguine, admiring
- **Right** – accurate, factual, lawful, proper, suitable
- **Run** – race, sprint, escape, elope, flee
- **Sad** – wretched, depressed, dejected, gloomy, dismal
- **Slow** – unhurried, leisurely, late, tedious, slack
- **Stop** – cease, pause, discontinue, conclude, end
- **Strange** – odd, peculiar, unfamiliar, queer, irregular
- **Strong** – stable, secure, solid, tough, brawny
- **Take** – capture, acquire, select, prefer, occupy, consume
- **Tell** – expose, uncover, narrate, explain, declare
- **Turbulent** – disordered, violent, unstable, unsettled, stormy
- **Think** – judge, deem, assume, contemplate, mediate
- **Use** – utilise, exhaust, spend, consume, exercise
- **Valid** – authorised, legitimate, reasonable, logical, justifiable
- **Weak** – frail, infirm, puny, fragile, ailing
- **Wrong** – incorrect, inaccurate, mistaken, erroneous, improper

## EXERCISE

**Directions:** In this section, you find a number of sentences, parts of which are underlined. For each underlined part, four words are listed below. Choose the word **nearest** in meaning to the underlined part and indicate your response in the Answer Sheet.

- We should always try to maintain and promote communal amity.  
(a) bondage (b) contention  
(c) friendship (d) understanding
- True religion does not require one to proselytise through guile or force.  
(a) translate (b) hypnotise  
(c) attack (d) convert
- That the plan is both inhuman and preposterous needs no further proof.  
(a) heartless (b) impractical  
(c) absurd (d) abnormal
- The attitude of the Western countries towards the third-world countries is rather callous to say the least.  
(a) passive (b) unkind  
(c) cursed (d) unfeeling
- Whatever the verdict of history may be, Chaplin will occupy a unique place in its pages.  
(a) judgement (b) voice  
(c) outcome (d) prediction
- He corroborated the statement of his brother.  
(a) confirmed (b) disproved  
(c) condemned (d) seconded
- Whatever opinion he gives is sane.  
(a) rational (b) obscure  
(c) wild (d) arrogant
- The story is too fantastic to be credible.  
(a) believable (b) false  
(c) readable (d) praiseworthy
- Catching snakes can be hazardous for people untrained in the art.  
(a) tricky (b) harmful  
(c) difficult (d) dangerous
- When the new teacher entered the classroom, he found the pupils restive.  
(a) at rest (b) idle  
(c) quiet (d) impatient
- There is no dearth of talent in this country.  
(a) scarcity (b) availability  
(c) plenty (d) absence
- The servants retired to their quarters.  
(a) entered (b) went away  
(c) ran away (d) mobilised
- The navy gave tactical support to the marines.  
(a) sensitiv (b) strategic  
(c) immediate (d) expert
- A genius tends to deviate from the routine way of thinking.  
(a) dispute (b) disagree  
(c) distinguish (d) differ
- He was greatly debilitated by an attack of influenza.  
(a) depressed (b) weakened  
(c) worried (d) defeated
- His efforts at helping the poor are laudable.  
(a) welcome (b) sincere  
(c) good (d) praiseworthy
- His conduct brought him reproach from all quarters.  
(a) rebuke (b) sympathy  
(c) indifference (d) remorse
- Hospitality is a virtue for which the natives of the East in general are highly admired.  
(a) Duty of a doctor  
(b) Generosity shown to guests  
(c) Cleanliness in hospitals  
(d) Kindness
- House rent in cities like Mumbai or Delhi has risen to astronomical figures beyond the reach of even high-salaried people.  
(a) exorbitant (b) commercial  
(c) planetary (d) illogical
- Appropriate technology holds the key to a nation's development.  
(a) Modern (b) Suitable  
(c) Effective (d) Growing
- He was enamoured of his own golden voice.  
(a) very fond of (b) concerned with  
(c) obsessed with (d) imbued with
- Some journalists are guilty of indulging in yellow journalism.  
(a) misrepresentation (b) vulgarization  
(c) sensational reporting (d) loud gestures
- His truancy is detrimental.  
(a) loyalty (b) integrity  
(c) honesty (d) absenteeism
- He is a maleficent person.  
(a) generous (b) cunning  
(c) criminal (d) friendly
- His aversion is known to all.  
(a) Hospitality (b) hostility  
(c) humility (d) humbleness

## Answer Key

1. (c)	2. (d)	3. (c)	4. (d)	5. (a)	6. (a)	7. (a)	8. (a)	9. (d)	10. (d)
11. (a)	12. (b)	13. (b)	14. (d)	15. (b)	16. (d)	17. (a)	18. (b)	19. (a)	20. (b)
21. (a)	22. (c)	23. (d)	24. (c)	25. (b)					

## Answers with Explanations

1. **Option (c) is correct.**  
*Explanation:* 'Bondage' means a state of being a slave, 'contention' means heated agreement and 'amity' means friendly relations. Thus, 'friendship' is the synonym of 'amity'.
2. **Option (d) is correct.**  
*Explanation:* 'Hypnotise' means to capture the whole attention of someone 'translate' means to express the sense of (words or text) in another language, 'proselytise' means to convert or attempt to convert (someone) from one religion, belief, or opinion to another which is similar to 'convert'.
3. **Option (c) is correct.**  
*Explanation:* Meaning of 'Preposterous' is 'contrary to reason or common sense; utterly absurd or ridiculous' which is similar to 'absurd'. 'Heartless' refers to a person who is emotionless, 'impractical' means not realistic or sensible and 'abnormal' refers to someone who is different from the normal.
4. **Option (d) is correct.**  
*Explanation:* Passive, unkind, and cursed are not synonymous to 'callous'. 'Callous' means 'showing or having an insensitive and cruel disregard for others' which is similar to 'unfeeling'.
5. **Option (a) is correct.**  
*Explanation:* In the context of the sentence, 'voice' and 'outcome' is not fit. 'Prediction' is also misfit in the context of history. 'Verdict' means 'a decision on an issue of fact in a civil or criminal case or an inquest' which is similar to 'judgement'.
6. **Option (a) is correct.**  
*Explanation:* The sentence says, he supported his brother's statement.' 'Corroborated' means 'confirm or give support to (a statement, theory, or finding)' which is similar to 'confirmed'.
7. **Option (a) is correct.**  
*Explanation:* Someone's 'opinion' can be logical or illogical. 'Sane' means '(of a person) of sound mind; not mad or mentally ill' and 'rational' means 'based on or in accordance with reason or logic'. Both are similar to each other.
8. **Option (a) is correct.**  
*Explanation:* The word 'too' has negative connotation, so the sentence means the story is not believable. 'Credible' means 'able to be believed; convincing' which is similar to 'believable'.
9. **Option (d) is correct.**  
*Explanation:* If an untrained person catches snake, it may not necessarily be harmful, but for sure will be risky for him. 'Hazardous' means 'risky; dangerous' which is similar to 'dangerous'.
10. **Option (d) is correct.**  
*Explanation:* 'Restive' means unable to remain silent. Options (a), (b) and (c) are the opposites of 'restive' as they all mean to be silent or at rest which leaves option (d) 'impatient' to be the correct answer.
11. **Option (a) is correct.**  
*Explanation:* 'Dearth' means scarcity or shortage of something. 'Availability' or 'plenty' will mean 'to be in large number or quantity'. Also 'absence' is the antonym of present, thus, it is the incorrect word.
12. **Option (b) is correct.**  
*Explanation:* 'Retired' in this sentence means to take rest or to take a break. So 'ran away' or 'mobilised' will not be its synonyms. Also 'entered' does not take the preposition 'to'. So, option (b) will be the correct answer.
13. **Option (b) is correct.**  
*Explanation:* 'Tactical' means carefully planned, So, 'strategic' will be its synonym. 'Sensitive' means easily affected or disturbed. 'Immediate' is something done at once or quickly. Also 'expert' support is not correct usage of the word.
14. **Option (d) is correct.**  
*Explanation:* 'Deviate' means to depart from the normal course. 'Differ' means to be of different opinion. So, option (d), 'differ' is the synonym. 'Dispute' means a fight or a disagreement. And 'distinguish' means to find differences. These words are not the synonyms of 'deviate'.
15. **Option (b) is correct.**  
*Explanation:* 'Debilitated' means to be weak. Option (a) 'depressed' means to be in a sad state of mind. 'Worried' means to be anxious or troubled. And 'defeat' means not to win. So, only option (b) is the suitable answer.
16. **Option (d) is correct.**  
*Explanation:* 'Laudable' means to be appreciated or praise-worthy. So, option (d) is suitable.
17. **Option (a) is correct.**  
*Explanation:* 'Reproach' means to express disapproval, so 'rebuke' will be the synonym. 'Rebuke' also means to express disapproval. 'Sympathy' means to show concern. 'Indifference' means uncerned and 'remorse' means sadness.
18. **Option (b) is correct.**  
*Explanation:* 'Hospitality' means generosity shown to guests i.e. to welcome the guests and serve them wholeheartedly. So, we choose option (b). Whereas, option (a) tells about the duty or responsibility of a doctor. Also option (c) is eliminated as it tells about cleanliness in hospitals meaning the hospitals should be kept neat and tidy. 'Kindness' in option (d) is also eliminated because it means being generous or good-hearted.
19. **Option (a) is correct.**  
*Explanation:* 'Astronomical' figures in this sentence means high price or exorbitant price. 'Commercial' means making profit or engaged in commerce trade. 'Planetary' means related to planets. And 'illogical' means without reasons. Therefore, these words can be eliminated.
20. **Option (b) is correct.**  
*Explanation:* 'Appropriate' means suitable or correct. Option (a) 'modern' means relating to present times or contemporary. Option (c) 'effective' means having the desired result. And option (d) 'growing' means to naturally develop in size as number and changing

physically. So options (a), (c), (d) can be eliminated.

**21. Option (a) is correct.**

*Explanation:* 'Enamoured' means very fond of or to like something a lot. So, option (b) 'Concerned with' means to be worried or anxious, which does not fit in the sentence. 'Obsessed with' means to be unable to stop thinking about something, to be too interested or worried about something. Option (d), 'imbued with' means to infuse or permeate with, thus, the third option is also not suitable for the sentence.

**22. Option (c) is correct.**

*Explanation:* Yellow journalism means the kind of reporting or journalism that is meant to sensationalise matters. So option (c) 'misrepresentation' will mean to show something wrongly. 'Vulgarisation' is something, cheap and indecent. And 'loud gestures' means noisy actions. So, options (a), (b), (d) can be eliminated.

**23. Option (d) is correct.**

*Explanation:* 'Truancy' is the habit of staying out of school without permission or shirking duty. This

is a negative word. 'Absenteeism' which refers to the habit of regularly staying away from school or work, is the synonym of 'truancy'. 'Loyalty' refers to a strong feeling of alliance, 'integrity' refers to the quality of being honest and 'honesty' means to be fair and truthful all of these words are the antonyms of 'truancy'.

**24. Option (c) is correct.**

*Explanation:* 'Maleficent' means baleful, working or productive of harm or evil. It is a negative word and options (a) and (d) are positive, so, they can be ruled out. 'Cunning' means characterised by wiliness and trickery. 'Criminal' is related to crime. Out of 'cunning' and 'criminal', criminal is closer to the word 'maleficent'.

**25. Option (b) is correct.**

*Explanation:* 'Aversion' means extreme dislike or disinclination. 'Hospitality', 'humility' and 'humbleness' are positive words. 'Hostility' which refers to an unfriendly attitude, is the correct answer.

# Chapter 02

# ANTONYMS

- Antonyms are an important and useful section of English grammar. An antonym is a word that has the opposite meaning to a given word. In simple words - words that have the opposite meaning of another word are called antonyms.
- Most antonyms are quite simple, like 'good' and 'bad', or 'black' and 'white'. Some words can be transformed into their antonyms simply by adding the prefixes 'un', 'in', or 'non', as when 'likable' is changed into its antonym, 'unlikable'. The word antonym itself comes from the Greek word **anti** which means **opposite**, and when it is added to - **onym**, which comes from the Greek word **onoma**, which means **name**. So, antonym literally means **opposite-name**.

## List of Antonyms

Word	Antonyms
Absurd	Rational, Sane
Abundance	Dearth
Accord	Disaccord, Disagreement
Acquit	Convict
Adopt	Reject
Affinity	Aversion
Amateur	Professional
Analysis	Synthesis
Appreciate	Depreciate
Arrogant	Humble
Ascent	Descent
Attract	Repel
Authentic	Spurious
Awkward	Graceful
Barbarous	Civilised
Barren	Fertile
Base	Noble
Benevolent	Malevolent
Brutal	Humane, Kind
Camouflage	Reveal
Cautious	Rash
Censure	Praise
Chaste	Impure, Unchaste
Concord	Discord
Condense	Lengthen, Expand
Confidence	Diffidence, Distrust
Delight	Displeasure, Sorrow

Dense	Sparse
Descend	Ascend
Despair	Hope
Destruction	Construction
Diffident	Confident
Diligent	Lazy
Disdain	Approve
Eclipse	Shine
Ecstasy	Despair
Elevation	Depression
Eligible	Ineligible
Emancipate	Enslave
Enmity	Friendship
Enthusiasm	Indifference
Equality	Inequality
Exceptional	Ordinary
Experience	Inexperience
Explicit	Implicit
Extensive	Intensive
External	Internal
Exterior	Interior
Extraordinary	Ordinary
Extravagant	Economical
Extrinsic	Intrinsic
Fabulous	Ordinary
Fact	Fiction
Fallacy	Truth
Fair	Foul
Familiar	Strange
Famous	Unknown, Notorious
Fanatical	Liberal
Fickle	Constant
Fictitious	True, Genuine
Fine	Coarse
Flexible	Stiff, Rigid
Folly	Wisdom
Forsake	Hold
Fragile	Enduring
Frantic	Subdued
Frugality	Lavishness

<b>Futility</b>	Utility
<b>Gloomy</b>	Gay
<b>Glut</b>	Scarcity
<b>Glory</b>	Shame
<b>Grisly</b>	Pleasing
<b>Growth</b>	Decline
<b>Grudge</b>	Affection, Benevolence
<b>Guilty</b>	Innocent
<b>Hapless</b>	Fortunate
<b>Humane</b>	Cruel
<b>Humble</b>	Proud
<b>Humility</b>	Arrogance
<b>Hypocrisy</b>	Sincerity
<b>Impulsive</b>	Cautious
<b>Incompetent</b>	Dexterous
<b>Inclusive</b>	Exclusive
<b>Indigent</b>	Rich, Affluent
<b>Indolent</b>	Active, Energetic
<b>Industrious</b>	Lazy, Slothful
<b>Inferior</b>	Superior, Royal
<b>Infernal</b>	Heavenly
<b>Inspid</b>	Pleasing
<b>Jaded</b>	Renewed
<b>Jampacked</b>	Empty
<b>Jellying</b>	Thawing
<b>Jejune</b>	Interesting
<b>Jive</b>	Honest, Sincere
<b>Jocular</b>	Depressed
<b>Jovial</b>	Solemn
<b>Judicious</b>	Irrational
<b>Junk</b>	Neatness
<b>Juvenile</b>	Dotage
<b>Kedge</b>	Hurt, Harm
<b>Keen</b>	Indifferent
<b>Kind</b>	Cruel, Apathetic
<b>Kindle</b>	Extinguish
<b>Kinky</b>	Straight
<b>Knave</b>	Innocent
<b>Knotty</b>	Manageable
<b>Knowing</b>	Ignorant
<b>Knowledge</b>	Ignorance
<b>Kudos</b>	Blame, Condemnation
<b>Lack</b>	Plenty
<b>Lacuna</b>	Sufficiency
<b>Languid</b>	Energetic, Vigorous

<b>Lavish</b>	Scarce
<b>Lax</b>	Reliable
<b>Leash</b>	Release
<b>Lethal</b>	Safe
<b>Linger</b>	Hasten
<b>Loyal</b>	Treacherous
<b>Material</b>	Spiritual
<b>Melancholy</b>	Gaiety
<b>Mighty</b>	Weak
<b>Miserly</b>	Generous
<b>Mitigate</b>	Augment
<b>Mollify</b>	Irritate
<b>Momentous</b>	Varied
<b>Motion</b>	Rest
<b>Neat</b>	Untidy
<b>Notion</b>	Reality
<b>Notorious</b>	Reputable
<b>Noxious</b>	Healing
<b>Numerous</b>	Deficient
<b>Obstinate</b>	Yielding
<b>Obstruct</b>	Encourage
<b>Obscure</b>	Prominent
<b>Obstinate</b>	Flexible
<b>Obtain</b>	Forfeit
<b>Occult</b>	Intelligible
<b>Odious</b>	Engaging
<b>Offspring</b>	Ancestor
<b>Ominous</b>	Auspicious
<b>Passion</b>	Coolness
<b>Pathetic</b>	Joyous
<b>Peace</b>	War
<b>Persuade</b>	Dissuade
<b>Physical</b>	Spiritual, Mental
<b>Plenty</b>	Scarcity
<b>Premium</b>	Discount
<b>Pride</b>	Humility
<b>Profit</b>	Loss
<b>Prospect</b>	Retrospect
<b>Prosperity</b>	Imprudent
<b>Quell</b>	Support, Aid
<b>Quick</b>	Slow, Tardy
<b>Quiet</b>	Noisy
<b>Raise</b>	Lower
<b>Rash</b>	Steady, Cautious
<b>Real</b>	False



Rear	Front
Receive	Give
Rectify	Falsify
Religious	Irreligious, Secular
Relish	Dislike
Remote	Near
Repulsive	Attractive
Sacred	Unholy, Profane
Safety	Danger
Sane	Insane
Satisfaction	Dissatisfaction
Savage	Civilised
Scanty	Plentiful
Secret	Open, Public
Sensible	Insensible, Senseless
Sensitive	Insensitive
Service	Disservice
Severe	Mild
Sharp	Blunt
Shy	Bold, Impudent
Silence	Noise
Sin	Virtue
Smart	Dull, Slow
Smile	Frown
Sober	Excited, Drunk
Sophisticated	Naive
Stale	Fresh
Stationary	Moving
Straight	Crooked
Sublime	Ridiculous
Success	Failure
Sufficient	Insufficient
Superior	Inferior
Surplus	Deficit
Swear	Forswear
Sweet	Bitter, Sour

Swift	Slow
Tame	Wild
Teach	Learn
Tedious	Lively
Temporary	Permanent
Temperate	Intemperate
Tender	Hard, Strong
Transient	Lasting, Permanent
Transparent	Opaque
Trust	Doubt
Total	Part
Unanimity	Dissent
Uniform	Variable
Uniformity	Variety
Utterly	Incomplete
Umbrage	Gratification
Unify	Diversify
Union	Disunion, Split
Vague	Definite
Valiant	Cowardly
Vain	Modest
Veteran	Novice
Vice	Virtue
Vigorous	Frail
Vigilant	Careless
Violent	Gentle
Vulgar	Refined
Wane	Wax
Want	Abundance
Warmth	Coolness
Wearisome	Refreshing
Wild	Civilised
Wilt	Revive
Woeful	Cheerful
Yearn	Satisfied

## EXERCISE

**Directions:** In this section, each item consists of a sentence with an underlined word. It is followed by four words, one of which is closest to the **opposite** in meaning of the underlined word. Choose the word and indicate your response in the Answer Sheet.

- His short but pointed speech was applauded by all sections of the audience.
  - disapproved
  - misunderstood
  - praised
  - welcomed
- In ancient India, scholars had no interest in political power or material growth.
  - internal
  - spiritual
  - psychic
  - celestial
- A friendly dog met us at the farm gate.
  - helpful
  - understanding
  - quiet
  - hostile
- He is extremely intelligent but proud.
  - dull
  - weak
  - ignorant
  - arrogant

5. The young leader was reluctant to shoulder the responsibilities of the ministerial office.  
 (a) wanting (b) willing  
 (c) anxious (d) eager
6. He abandoned his family.  
 (a) supported (b) encouraged  
 (c) anxious (d) saved
7. History abounds in instances of courage.  
 (a) shines (b) lacks  
 (c) suffices (d) fails
8. Adversity teaches man to be humble and self-reliant.  
 (a) sincerity (b) animosity  
 (c) curiosity (d) prosperity
9. Like poverty, affluence can sometimes create its own problems.  
 (a) indigence (b) opulence  
 (c) sorrow (d) exuberance
10. The habit of squandering money should not be encouraged.  
 (a) discarding (b) hoarding  
 (c) donating (d) stealing
11. John is always shabbily dressed.  
 (a) decently (b) beautifully  
 (c) extravagantly (d) scantily
12. The new manager of the bank is urbane in his manners.  
 (a) civilised (b) slow  
 (c) rude (d) foolish
13. It is necessary to develop thrifty habits to be able to lead a comfortable life.  
 (a) expensive (b) extravagant  
 (c) economical (d) good
14. Many people suffer because of pride.  
 (a) lowliness (b) submission  
 (c) humility (d) obedience
15. He handled the machine with deft fingers.  
 (a) delicate (b) sturdy  
 (c) quick (d) clumsy
16. I was deeply affected by his urbane behaviour.  
 (a) rural (b) rude  
 (c) irrational (d) indifferent
17. His timidity proved costly.  
 (a) arrogance (b) boldness  
 (c) skillfulness (d) cunning
18. Arrangements were made to handle the mammoth gathering tactfully.  
 (a) significant (b) small  
 (c) unruly (d) noisy
19. He was engrossed in his work when I walked in.  
 (a) occupied (b) inattentive  
 (c) engaged (d) absent
20. These are the main points of the preceding paragraph.  
 (a) following (b) previous  
 (c) first (d) last
21. He made a shrewd guess.  
 (a) clever (b) wild  
 (c) incorrect (d) discriminating
22. He is suffering from a severe cough.  
 (a) violent (b) mild  
 (c) bad (d) continuous
23. Cumulatively, the effect of these drugs is quite bad.  
 (a) individually (b) obviously  
 (c) clearly (d) collectively
24. He was conspicuous because of his colourful shirt.  
 (a) charming (b) ugly  
 (c) small (d) unnoticeable
25. He hates these continual arguments with his friend.  
 (a) repeated (b) irrational  
 (c) occasional (d) regular

### Answer Key

1. (a)	2. (b)	3. (d)	4. (a)	5. (b)	6. (a)	7. (b)	8. (d)	9. (b)	10. (b)
11. (a)	12. (c)	13. (b)	14. (c)	15. (d)	16. (b)	17. (b)	18. (b)	19. (b)	20. (a)
21. (b)	22. (b)	23. (a)	24. (d)	25. (c)					

### Answers with Explanations

**1. Option (a) is correct.**

**Explanation:** Options (c) and (d) are the synonyms of the underlined word and thus, can be eliminated. 'Misunderstood' means incorrectly understood which is not related to 'applauded' in any sense. Thus, option (a) 'disapproved' which means to not approve of something or someone is the antonym of 'applauded'.

**2. Option (b) is correct.**

**Explanation:** 'Material' refers to 'physical objects rather than the mind or spirit' and 'spiritual' means 'relating to or affecting the human spirit or soul as opposed to material or physical things'. It is clear that they are opposite in meaning and rest of the options are not related at all.

**3. Option (d) is correct.**

**Explanation:** 'Friendly' means 'kind and pleasant' just as a friend and options (a), (b) and (c) are close

in meaning to it. 'Hostile' means 'showing or feeling opposition or dislike; unfriendly'. It is clear that 'friendly' and 'hostile' are antonyms.

**4. Option (a) is correct.**

**Explanation:** 'Intelligent' means 'having or showing sharpness of mind' and 'dull' means 'lacking interest or excitement or sharpness of mind'. It is clear that 'intelligent' and 'dull' are opposite in meaning.

**5. Option (b) is correct.**

**Explanation:** 'Wanting' is not grammatically correct, 'anxious' means 'worried' or 'nervous', 'eager' means 'keenly interested'. 'Reluctant' means 'unwilling and hesitant; disinclined' and the exact opposite of it can only be 'willing'.

**6. Option (a) is correct.**

**Explanation:** 'Abandon' means 'to desert or leave forever' and the opposite of it can only be 'supported'.