



# WARRIOR ONE SHOT SERIES

*Class 10<sup>th</sup> Board*

Geography

Minerals & Energy Resources

By- Riya Ma'am



# TOPICS *to be covered*



- 1 Introduction ✓
- 2 Mode of Occurrence ✓
- 3 Classification of Minerals ✓
- 4 Energy Resources



# Approach

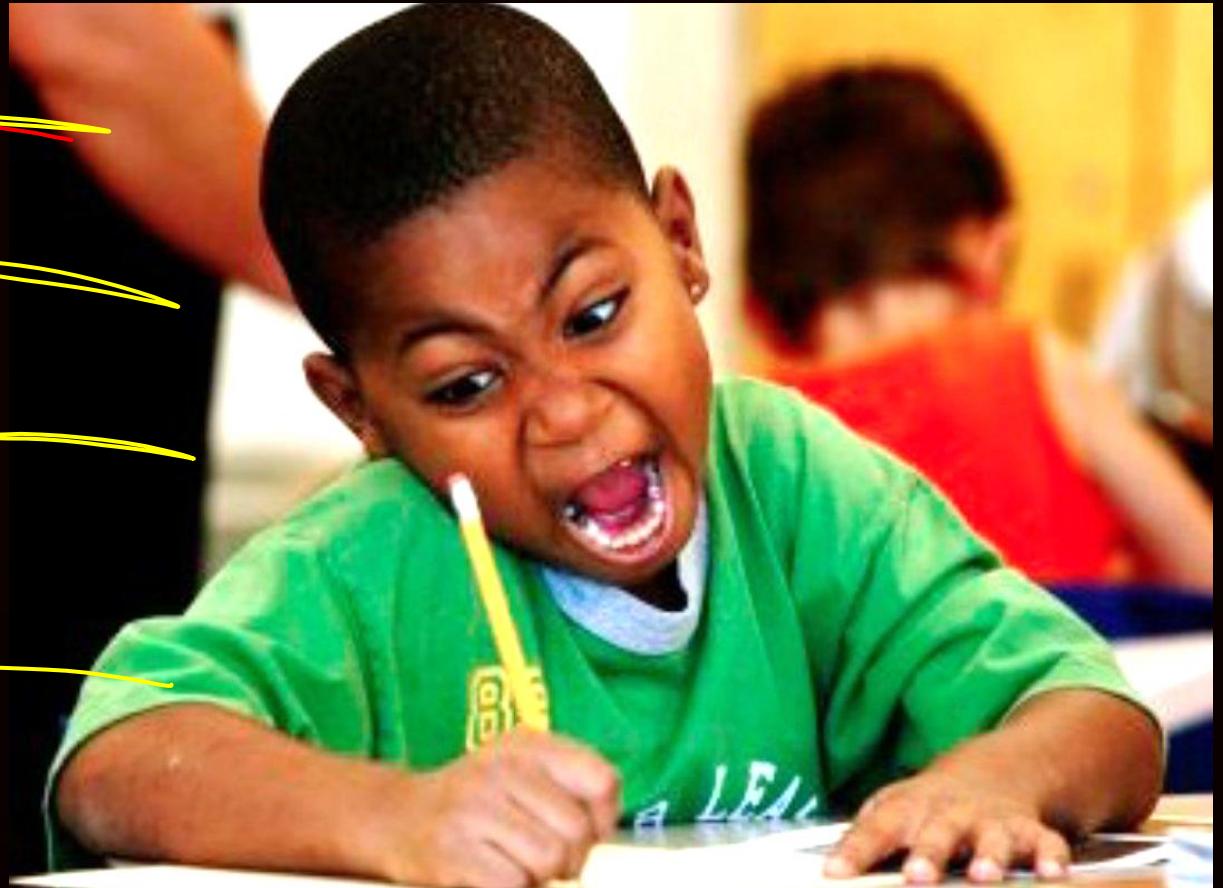
Minerals and Energy Resources	<p><b>Identify:</b></p> <p>a. Iron Ore mines</p> <ul style="list-style-type: none"><li>• Mayurbhanj</li><li>• Durg</li><li>• Bailadila</li><li>• Bellary</li><li>• Kudremukh</li></ul> <p>b. Coal Mines</p> <ul style="list-style-type: none"><li>• Raniganj</li><li>• Bokaro</li><li>• Talcher</li><li>• Neyveli</li></ul> <p>c. Oil Fields</p> <ul style="list-style-type: none"><li>• Digboi</li><li>• Naharkatia</li><li>• Mumbai High</li><li>• Bassien</li><li>• Kalol</li><li>• Ankaleshwar</li></ul> <p><b>Locate &amp; label: Power Plants</b></p> <p>a. Thermal</p> <ul style="list-style-type: none"><li>• Namrup</li><li>• Singrauli</li><li>• Ramagundam</li></ul> <p>b. Nuclear</p> <ul style="list-style-type: none"><li>• Narora</li><li>• Kakrapara</li><li>• Tarapur</li><li>• Kalpakkam</li></ul>
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Chapter No.	Chapter Name	No. of Periods	20 inclusive of map pointing
1	Resources and Development	7	
2	Forest and Wildlife Resources	7	
3	Water Resources	7	
4	Agriculture	10	
5	Minerals and Energy Resources	10	17 + 3 map pointing
6	Manufacturing Industries	10	
7	Lifelines of National Economy  Only map pointing to be evaluated in the Board Examination  Interdisciplinary project as part of multiple assessments  (Internally assessed for 5 marks)	2	



## Approach

Concept Coverage ←  
Question Based ←  
PYQs ←  
Mark Work ←





# Introduction

- Minerals are an indispensable part of our lives.
- The earth's crust is made up of different minerals embedded in the rocks.
- Various metals are extracted from these minerals after proper refinement.
- Minerals are found in varied forms in nature, ranging from the hardest diamond to the softest talc. Why?

Formation of minerals depends upon the physical and chemical conditions under which the material forms.

3M

justify



2M



# What is a Mineral?

• **Geologists define mineral as:**

**"Homogenous, naturally occurring substance with a definable internal structure."**

**Geographers**

ists

**Study minerals as part of the earth's crust for a better understanding of landforms.**



vs

**Geolog**

**Interested in the formation of minerals, their age and physical and chemical composition.**





# Mode of Occurrence of Minerals

Where are these minerals found?

Found in "Ores"

**Ore:** Used to describe an accumulation of any mineral mixed with other elements.

Why is it important for us to understand the main types of formations in which minerals occur?

- The mineral content of the ore must be in sufficient concentration.
- The type of formation/structure in which they are found determines ease with which mineral ores may be mined, also determines the cost of extraction.



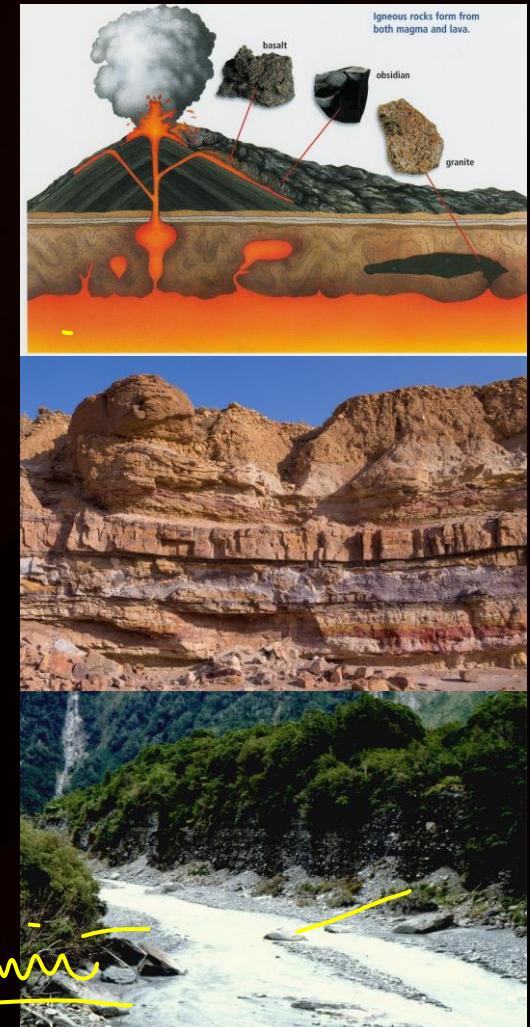


# Mode of Occurrence of Minerals

Minerals generally occur in these forms:

- In **igneous and metamorphic rocks**: In the cracks, crevices, faults or joints (Veins/lodes). Ex. Zinc, lead, copper, etc.
- In **sedimentary rocks**: In beds or layers. Ex. Coal and some forms of iron ore gypsum, potash salt and sodium salt.
- The decomposition of surface rocks, and the removal of soluble constituents, leaving a residual mass of weathered material containing ores. Ex. Bauxite.
- Certain minerals may occur as **alluvial deposits** in sands of valley floors and the base of hills (placer deposits)
- The ocean waters contain vast quantities of minerals.

46B → 2 Alumina → 1 ton alumina



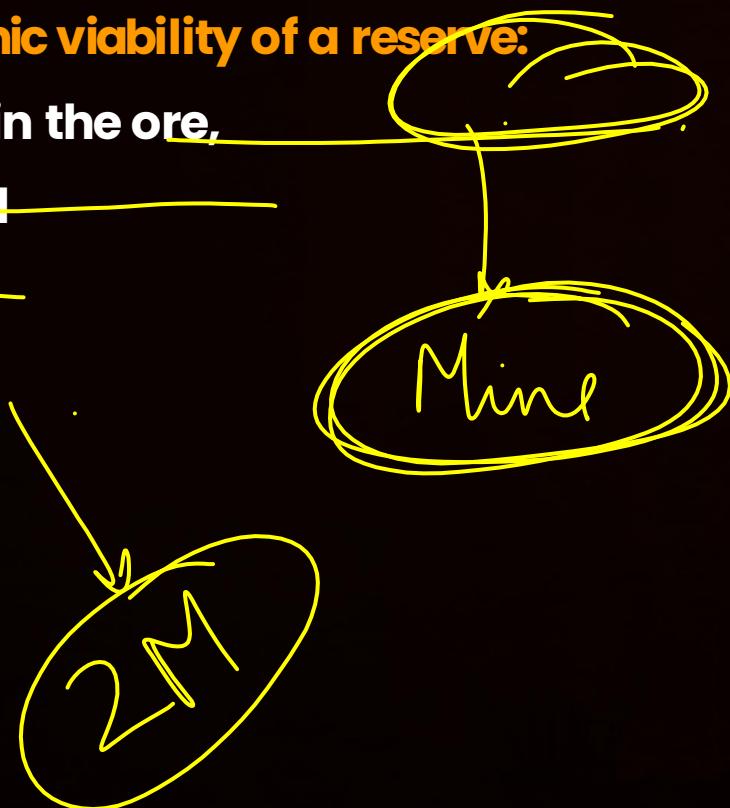


# Classification of Minerals

India is fortunate to have fairly rich and varied mineral resources. However, these are unevenly distributed.

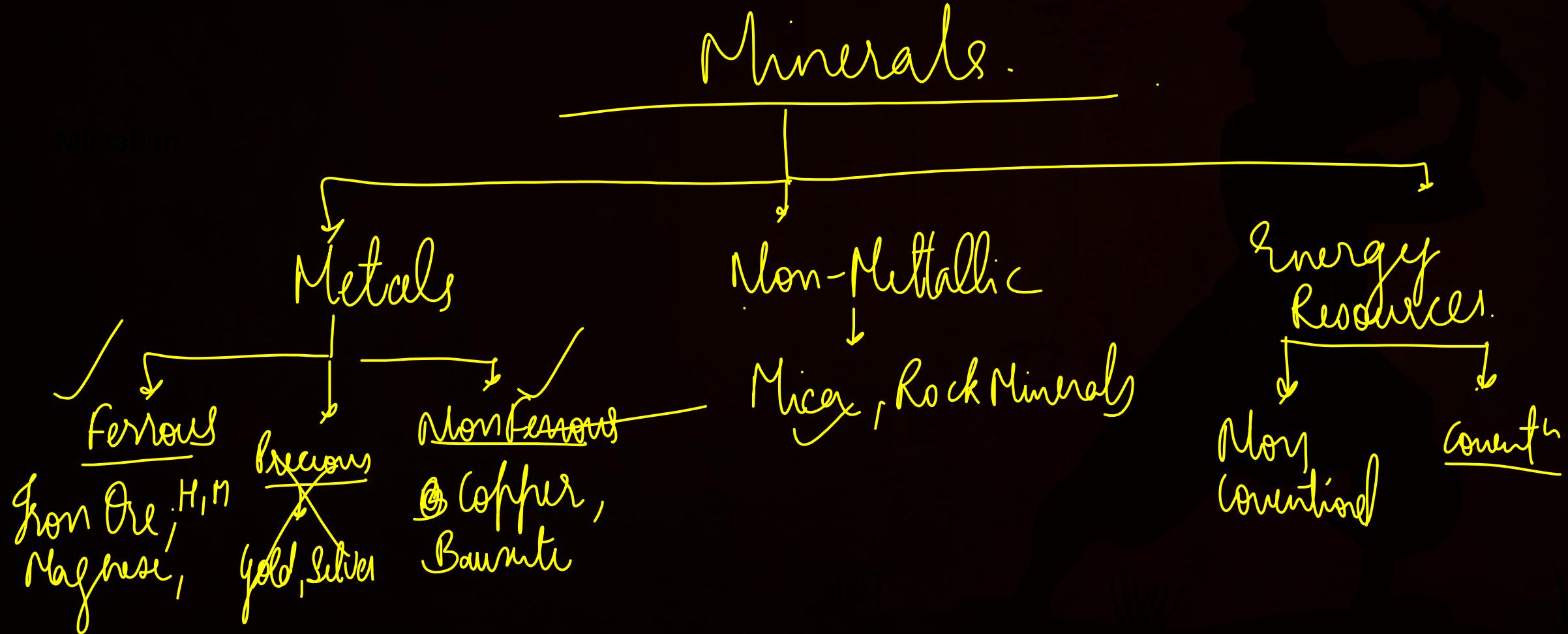
**Factors affecting the economic viability of a reserve:**

- Concentration of mineral in the ore,
- The ease of extraction and
- Closeness to the market.





# Classification of Minerals





# Classification of Minerals





# Ferrous Minerals

(70%) (50-60%)  
M > H.

Production : **3/4<sup>th</sup> of the total value of metallic minerals.**

Development of : Metallurgical industries.

Export : After meeting internal demands.

- **Iron Ore:**
- Backbone of industrial development, fairly abundant.
- Magnetite(70%), Hematite (50-60%).
- **Manganese:**
- Manufacturing of steel and ferro-manganese alloy, bleaching powder, insecticides and paints.
- Nearly 10 kg of manganese : one ton of steel.



## Do you know?

Kudre in Kannada means horse. The highest peak in the western ghats of Karnataka resembles the face of a horse. The Bailadila hills look like the hump of an ox, and hence its name.

## Odisha-Jharkhand belt:

Durg-Bastar-Chandrapur belt lies in Chhattisgarh and Maharashtra. Very high

Ballari-Chitradurga-Chikkamagaluru-Tumakuru belt in Karnataka has large

Marashtra-Goa belt includes the state of Goa and Ratnagiri district of





## Non-Ferrous Minerals

India's reserves and production of non-ferrous minerals is not very satisfactory. Example, copper, bauxite, lead, zinc and gold.

### Copper:

- Critically deficient in the reserve and production of copper.
- Mainly used in electrical cables, electronics and chemical industries.
- Mines: The Balaghat mines in Madhya Pradesh, Khetri mines in Rajasthan and Singhbhum district of Jharkhand are leading producers of copper.





## Non-Ferrous Minerals

6-4tonn B → 2tonn Alumina → 1tonn Alu



### Bauxite:



- Formed by the decomposition of a wide variety of rocks rich in aluminium silicates.
- Aluminium is important metal because it provides strength.
- **Bauxite reserves:** Amarkantak plateau, Maikal hills and the plateau region of Bilaspur-Katni.

Odisha was the largest bauxite producing state in India in 2016-17. Panchpatmali deposits in Koraput district.



### Interesting Fact

After the discovery of aluminium Emperor Napoleon III wore buttons and hooks on his clothes made of aluminium and served food to his more illustrious guests in aluminium utensils and the less honourable ones were served in gold and silver utensils. Thirty years after this incident aluminium bowls were most common with the beggars in Paris.



# Metallic Non-Ferrous Minerals



**Mica:**

**Most indispensable minerals used in electric and electronic industries:**

**Due to its excellent dielectric strength, low power loss factor, insulating properties and resistance to high voltage.**

→ **Deposits:**

- The northern edge of the **Chota Nagpur plateau**.
- **Koderma Gaya-Hazaribagh belt** of Jharkhand is the leading producer.
- In Rajasthan, is around **Ajmer**.
- In Andhra Pradesh, **Nellore mica belt**.





# Rock Minerals

## Limestone:

- **In association with:** Rocks composed of calcium carbonates or calcium and magnesium carbonates.
- **Found in:** Sedimentary rocks of most geological formations.
- **Uses:** Basic raw material for the cement industry and essential for smelting iron ore in the blast furnace.





# Hazards of Mining

- **Pulmonary diseases:** Inhalation of dust and noxious fumes.
- **Site risks:** Collapsing mine roofs, inundation and fires in coal mines.
- **Contamination of water resources:** Due to mining.
- **Dumping of waste and slurry:** Degradation of land, soil, and increase in stream and river pollution.

Stricter safety regulations and implementation of environmental laws are essential to prevent mining from becoming a “killer industry”

• Why?





# Conservation of Minerals

Why?

- Volume of workable mineral deposits: 1% of the earth's crust.
- Rapidly consuming mineral resources.
- Rates of consumption >>> Rate of replenishment *formation* *Explain*
- Therefore, finite and non-renewable.
- Country's deposits are extremely valuable but short-lived. *Explain*
- Continued extraction of ores leads to:  
Increasing cost of extraction + decrease in quality.

3M / 5M.





# Conservation of Minerals

## Solution:

- A concerted effort has to be made in order to use our mineral resources in a planned and sustainable manner.
- Improved technologies need to be constantly evolved to allow use of low grade ores at low costs.
- Recycling of metals, using scrap metals and other substitutes.

flow?





# Energy Resources

It is needed to cook, to provide light and heat, to propel vehicles and to drive machinery in industries.

- Coal
- Petroleum
- Natural Gas
- Electricity
- Uranium

Hydro Electricity : Pani : Renewable Energy  
Thermal Electricity : Coal

Non Conventional  
Renewable Energy  
Non Renewable  
Conventional Energy



# Energy Resources

## Classification:

### Conventional sources

Firewood, cattle dung cake, coal, petroleum, natural gas and electricity (both hydel and thermal).

### Non-conventional

Solar, wind, tidal, geothermal, biogas and atomic energy.

70% of rural household: Firewood and cattle dung cake.

Difficult to continue:

- a. Firewood because: Decreasing forest area.
- b. Cow Dung because: Consumes most valuable manure which could be used in agriculture.



# Conventional Sources of Energy

- Coal :

200 NW  
Compression; Lignite, Bituminous, Anthracite;  
Gondwana, Tertiary deposits. — 55 Milli Old.

- Petroleum:

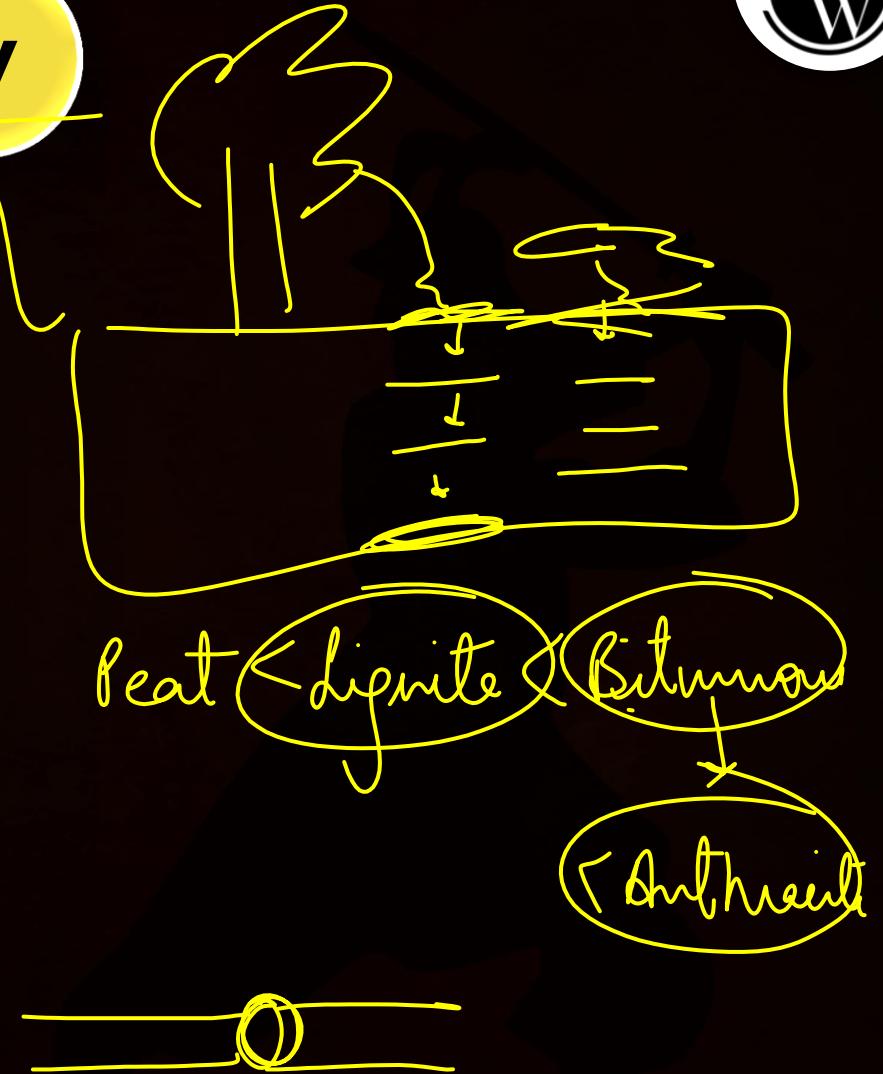
Nodal industry; anticlines and fault traps; Assam.

- Natural Gas:

Environment friendly fuel; CNG; power, fertilizer  
industry.

- Electricity:

Hydro electricity; Thermal electricity.





# Non-Conventional Sources of Energy

Pressing need to use renewable energy sources. Why?

Growing consumption of energy rising prices of oil and gas,  
increasing use of fossil fuels.

5 M / 3 M

- Nuclear and atomic energy
- Solar Energy
- Wind power
- Biogas
- Tidal Energy
- Geothermal Energy



# Non-Conventional Sources of Energy

**Nuclear and atomic energy**



Uranium, Thorium





# Non-Conventional Sources of Energy

Solar Energy

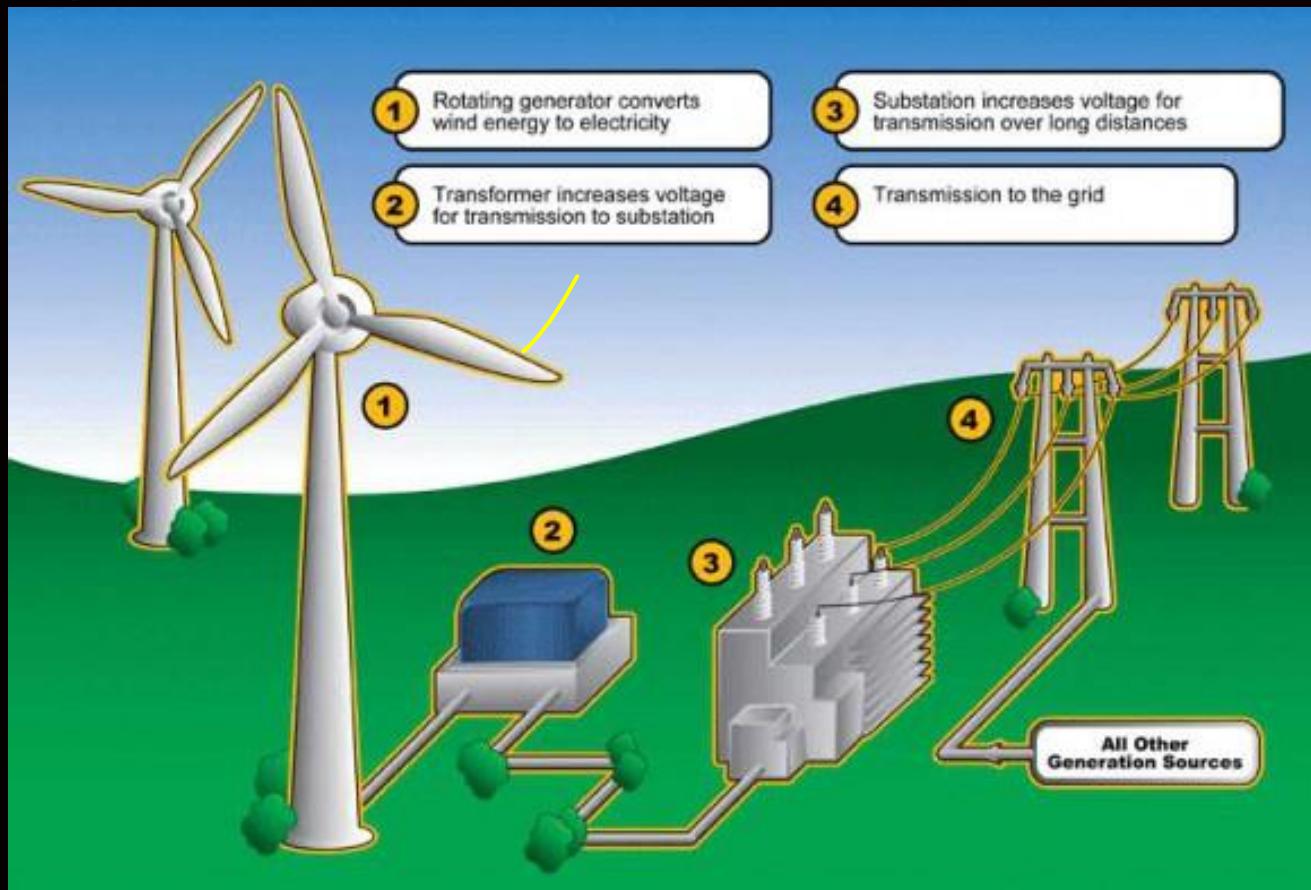


- Solar Panel.
- Non conventional
- Pollution X
- Industries, School, Hospital  
geyser,



# Non-Conventional Sources of Energy

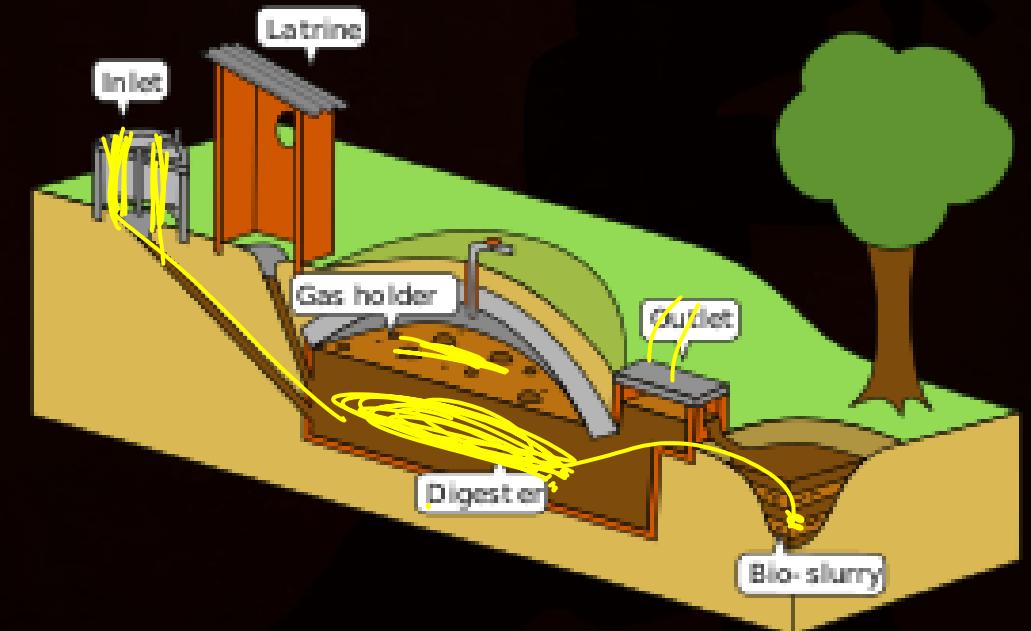
## Wind power





# Non-Conventional Sources of Energy

Biogas



Rural Areas,



# Non-Conventional Sources of Energy

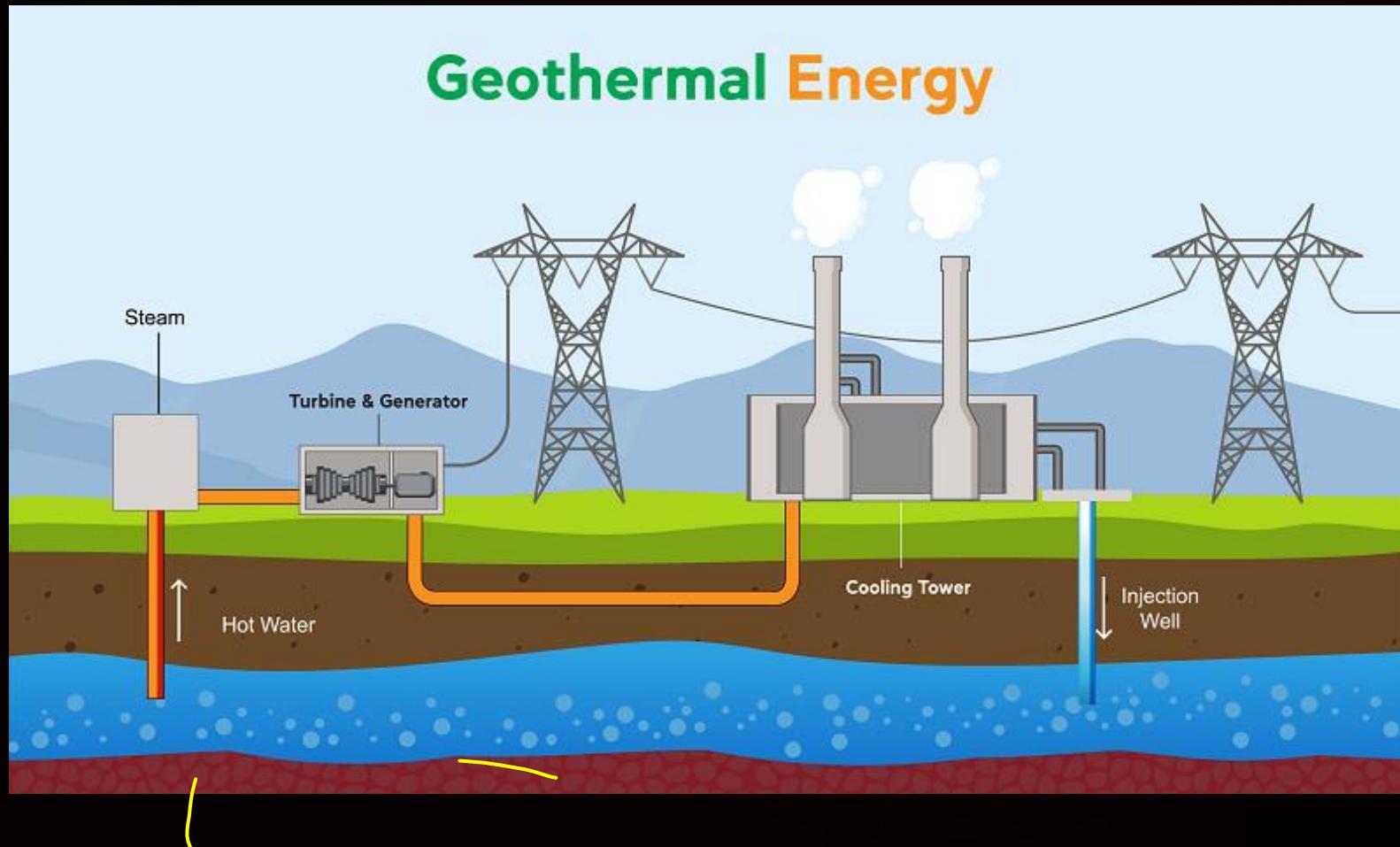
Tidal Energy





# Non-Conventional Sources of Energy

## Geothermal Energy





# Conservation of Energy Resources

**Energy is a basic requirement for economic development.**

- Need to develop a sustainable path of energy development:
- Can be done by:
  - Using public transport > individual vehicles.
  - Switching off electricity when not in use.
  - Using power-saving devices and
  - Using non-conventional sources of energy.

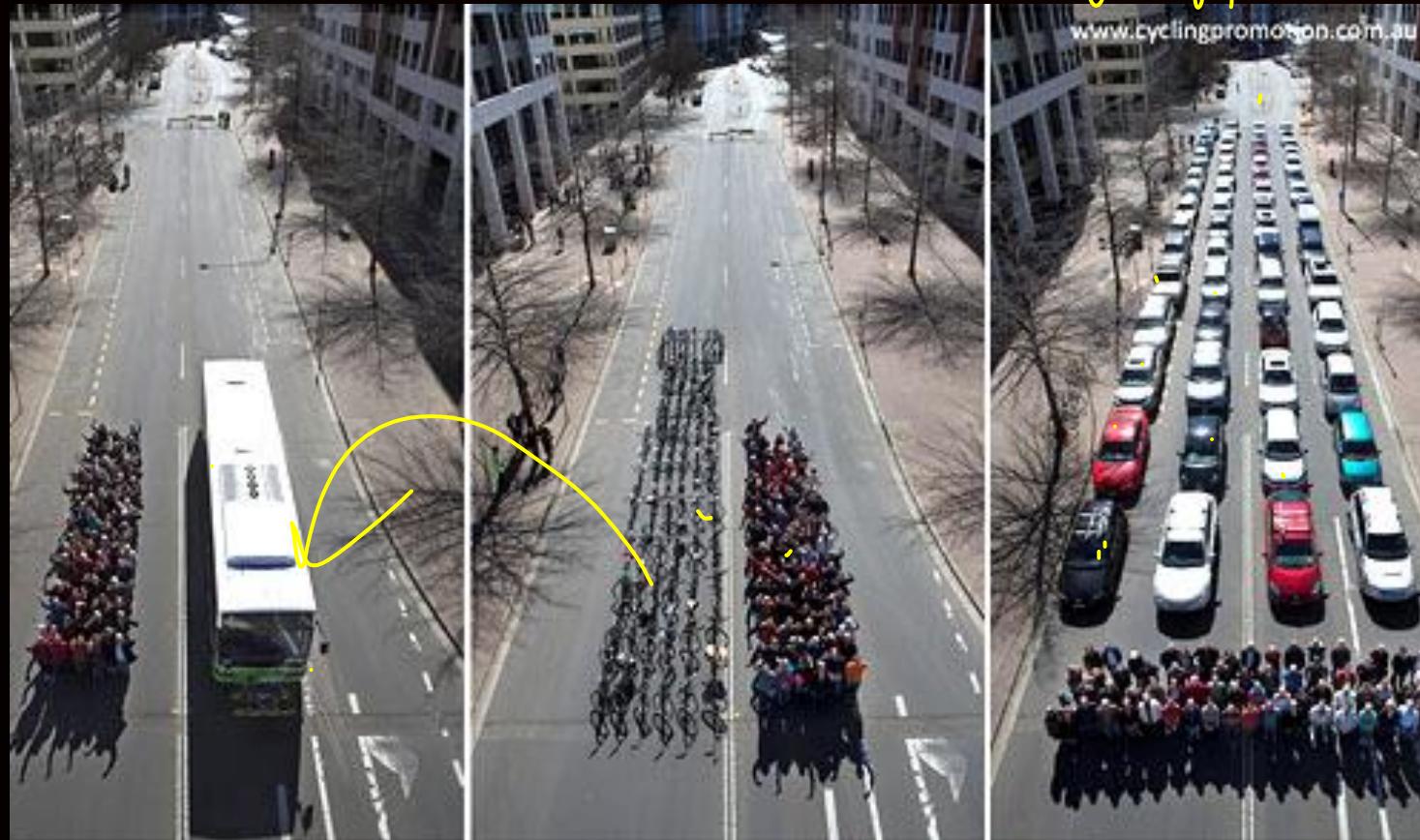
*Solutions*



# Conservation of Energy Resources

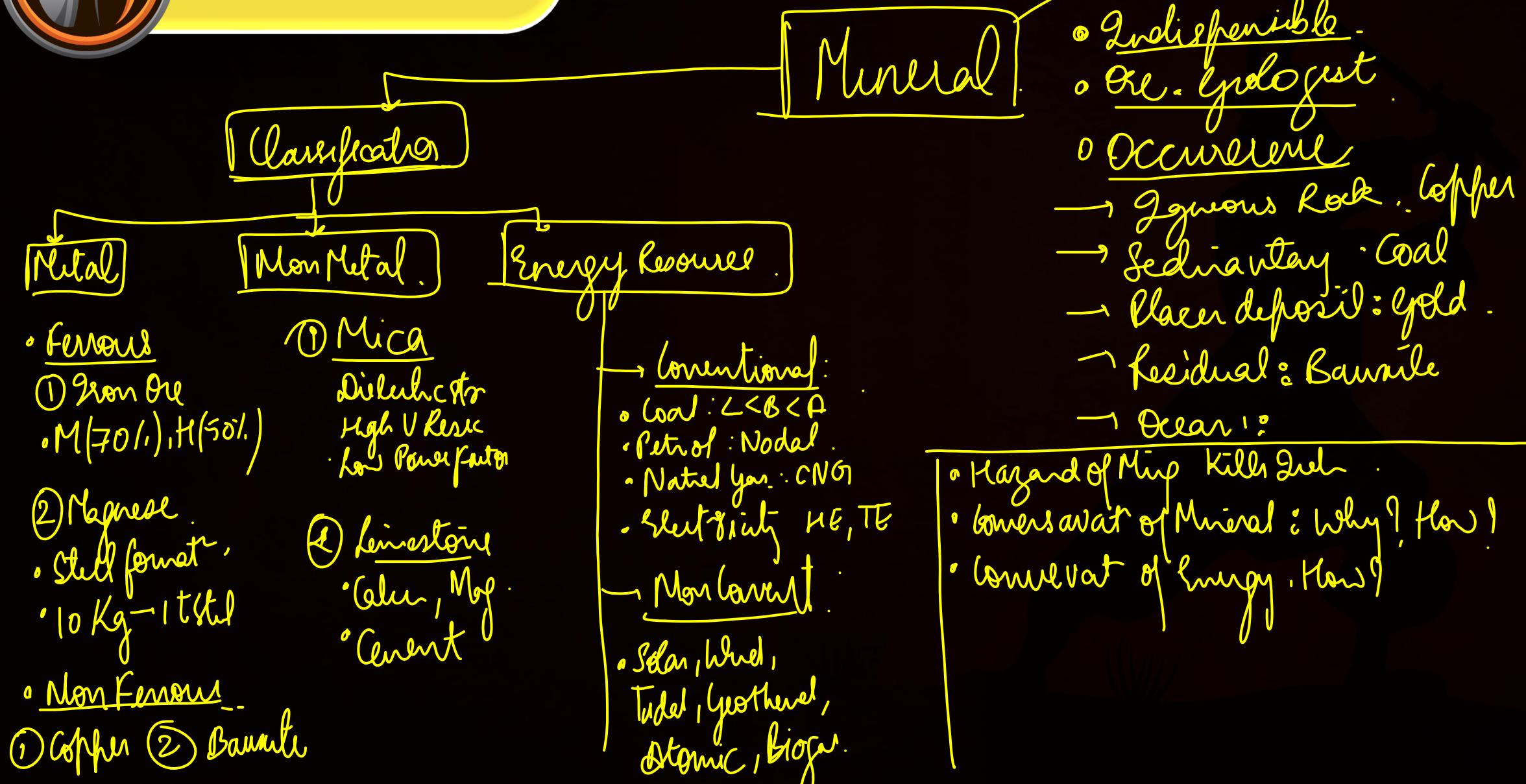
After all, "**Energy saved is energy produced**".

*Justify*





# Mind Map





## PYQs



24. (a) 'Energy saved is energy produced.' Support the statement.

2

OR

(b) Why is there a pressing need to use non-conventional energy resources ? Explain.

2

→ 2022.

Ans . • Public Transport

• Electricity off .

• Non conventional forms of energy .

• Power saving devices .

◦ Conventional :-

→ Polluting

→ environment dan.

→ Non Renewable .



## PYQs



2018/19

Why is it necessary to conserve mineral resources ? Explain any four ways  
to conserve mineral resources.

How ?

Explain the importance of conservation of minerals. Highlight any three  
measures to conserve them.



## PYQs



‘Consumption of energy in all forms has been rising all over the country. There is an urgent need to develop a sustainable path of energy development and energy saving’. Suggest and explain any three measures to solve this burning problem.

50

- o Non Conventional ✓, Conventional X
- o Public Transport ✓
- o Light X
- o Power .



## PYQs

24. "India is fortunate to have fairly rich and varied mineral resources". Elaborate the statement.

[5]

India is fortunate to have fairly rich and varied mineral resources. However, these are unevenly distributed. Broadly speaking, peninsular rocks contain most of the reserves of coal, metallic minerals, mica and many other non-metallic minerals. Sedimentary rocks on the western and eastern flanks of the peninsula, in Gujarat and Assam have most of the petroleum deposits. Rajasthan with the rock systems of the peninsula, has reserves of many

non-ferrous minerals. The vast alluvial plains of north India are almost devoid of economic minerals. These variations exist largely because of the differences in the geological structure, processes and time involved in the formation of minerals.

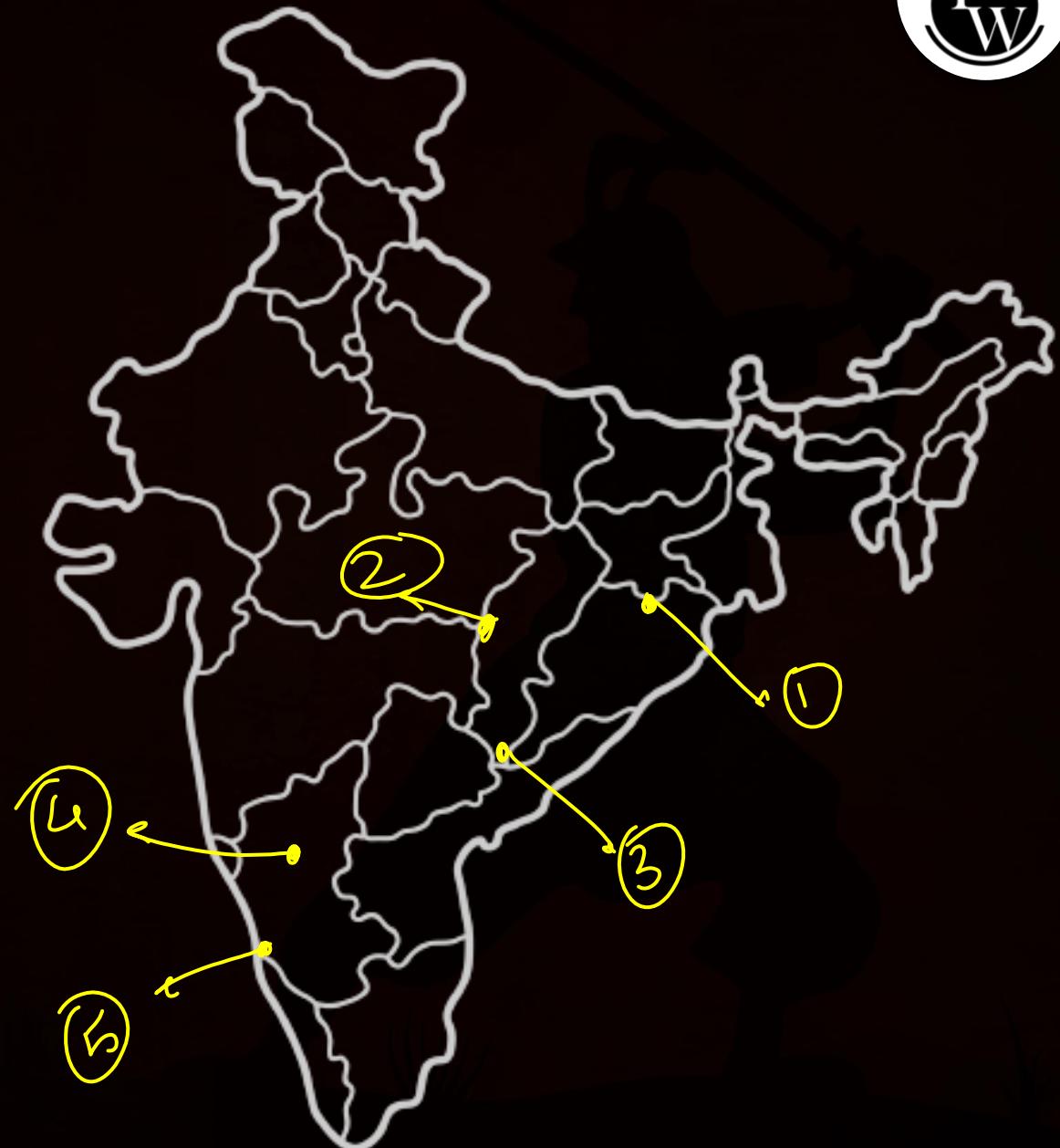


## Map work

### Minerals

#### a. Iron Ore mines

- Mayurbhanj → Odisha.
- Durg ] Chhattisgarh .
- Bailadila ] Jharkhand .
- Bellary ] Karnataka .
- Kudremukh ] Karnataka .



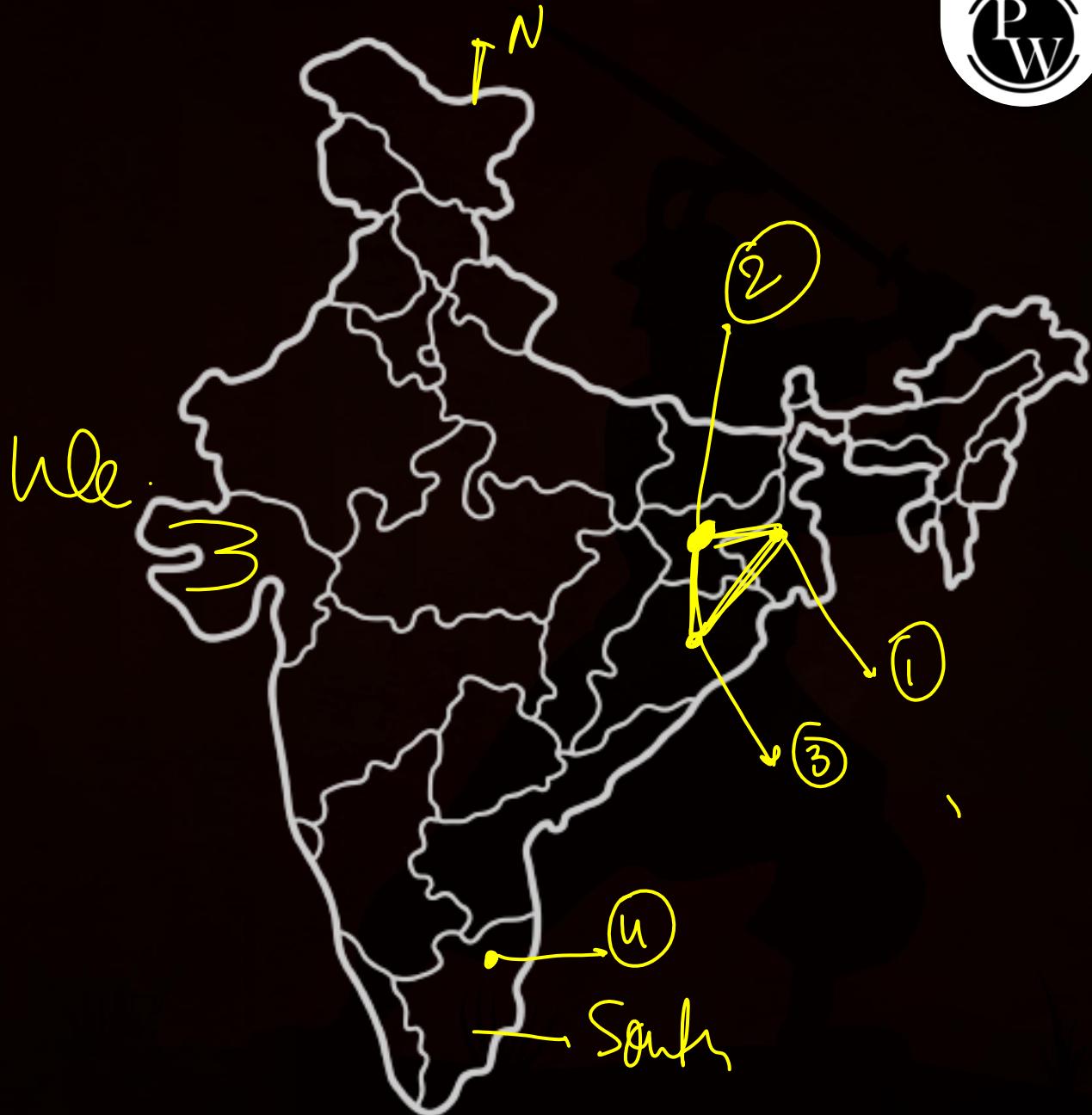


## Map work

Identify  
Minerals

### b. Coal Mines

- Raniganj : West Bengal
- Bokaro : Jharkhand
- Talcher : Odisha
- Neyveli
- Tandur
- Nainital





## Map work

### Minerals

#### c. Oil Fields

- Digboi
  - Naharkatia
  - Mumbai High
  - Bassein
  - Kalol
  - Ankleshwar
- Assam
- MH
- Gujarat
- 





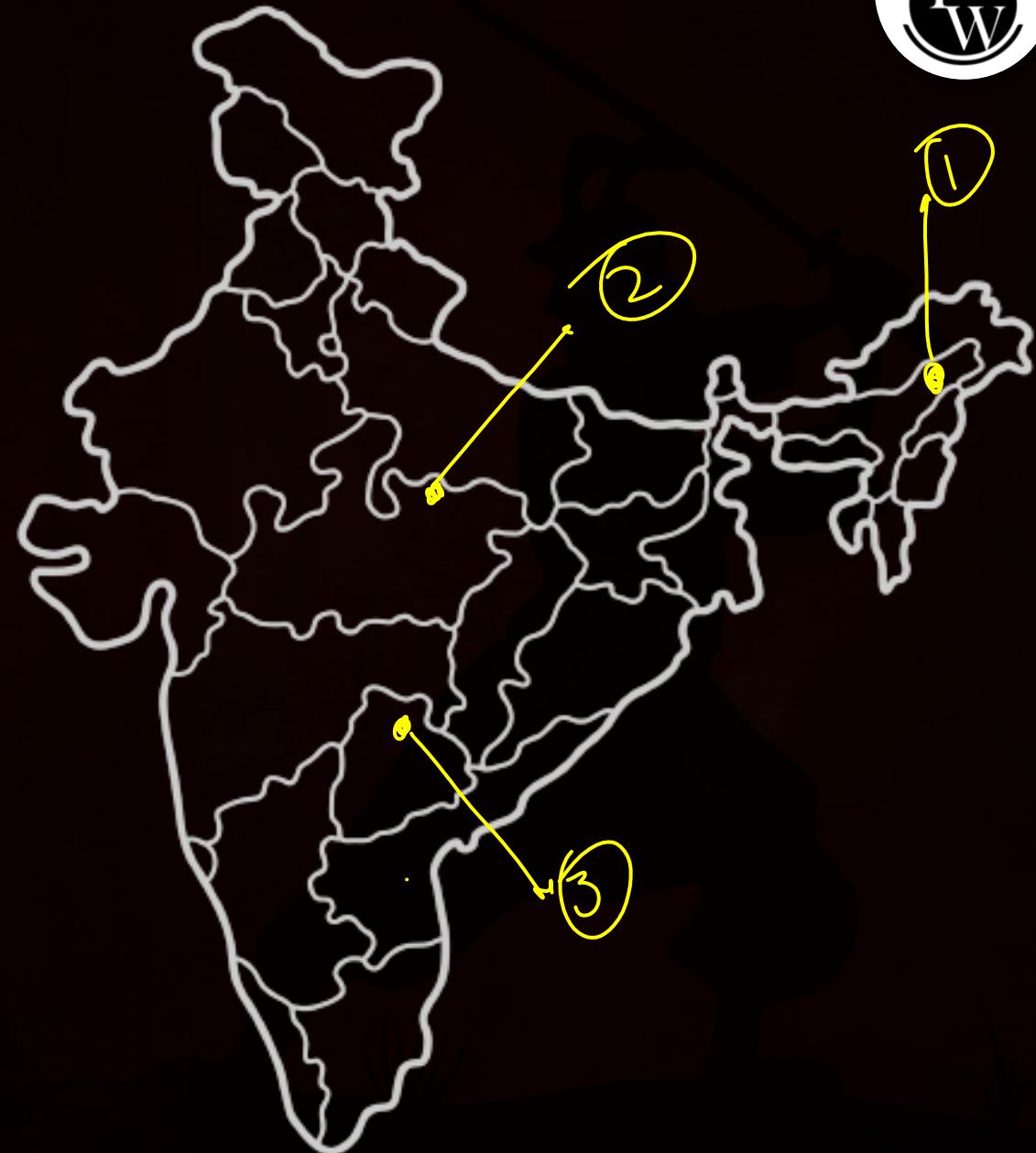
## Map work

Locate

### Power Plants

#### a. Thermal Plants

- Namrup : Assam
- Singrauli : MP
- Ramagundam : Telangana



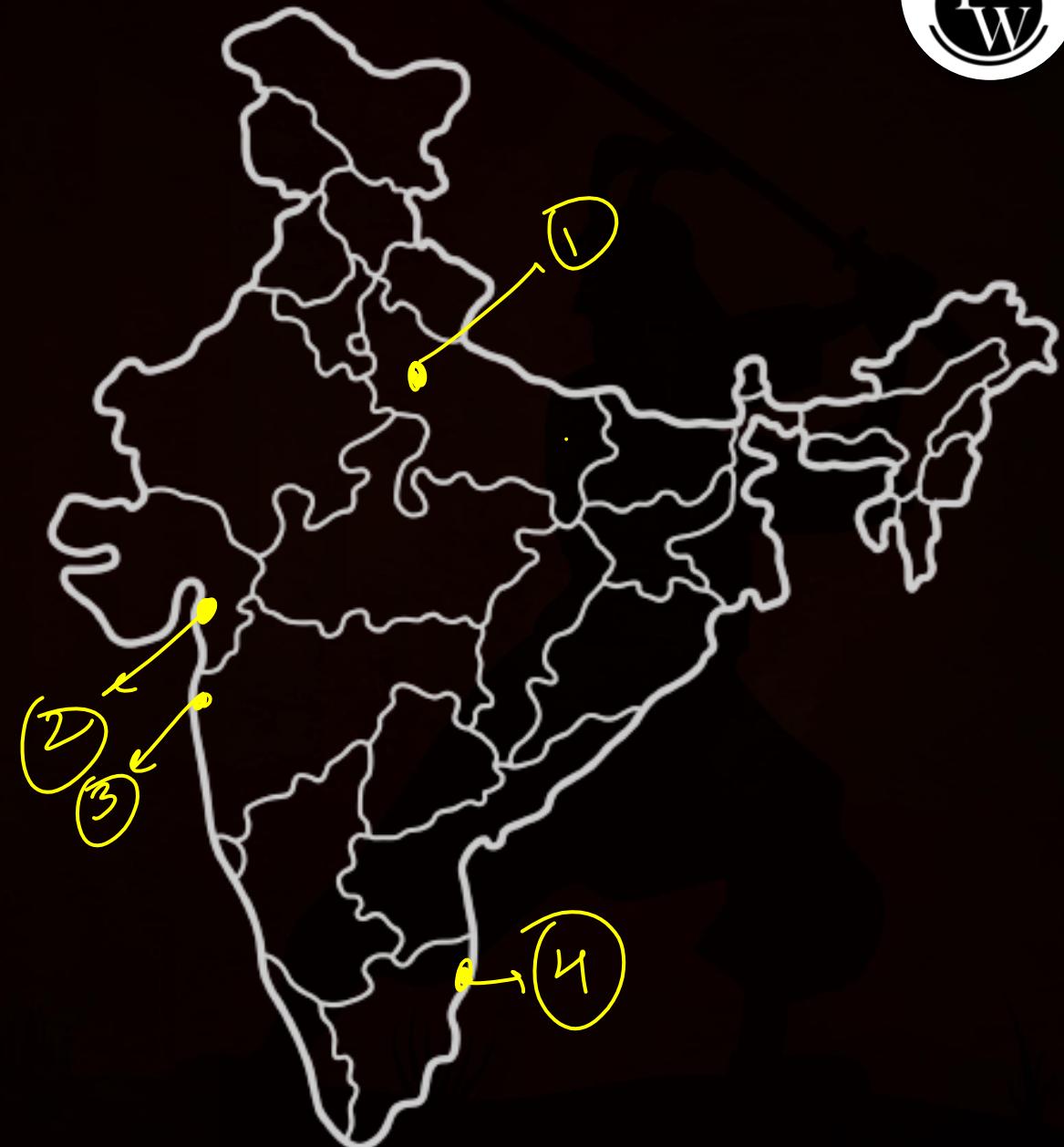
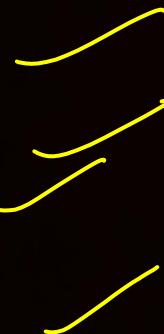


## Map work

### Power Plants

#### b. Nuclear

- Narora
- Kakrapara
- Tarapur
- Kalpakkam





# Map work

## SECTION E

### (Map-Based Question)

(1+2=3)

(i) On the given political outline map of **India** (on page 11), identify the place marked as 'A' with the help of the following information and write its correct name on the line marked near it.

- A. The place where Non-Cooperation Movement was called off  
B. due to violence.

1

(ii) On the same given map of **India**, locate and label the following :

- (a) (I) Narora Nuclear Power Plant

1

OR

- (II) Bengaluru Software Technology Park

1

- (b) Indira Gandhi International Airport

1

A



## PYQs

10. In which of the following States is Kalpakkam Nuclear Power Plant located?

1

- A. Gujarat
- B. Odisha
- C. Kerala
- D. Tamil Nadu *Chennai*



## PYQs

11. Choose the correct option from columns A and B.

A	B
(a) Chandrapur thermal power plant	(i) Odisha <i>b</i>
(b) Mayurbhanj iron ore mines	(ii) Amarkantak
(c) Kalol oil fields	(iii) Gujarat <i>c</i>
(d) Bauxite mines	(iv) Jharkhand



## Map Practise



- (b) On the same political outline map of **India**, locate and label any **three** of the following with suitable symbols :  $3 \times 1 = 3$
- (i) Tehri Dam  
(ii) **Bokaro - Coal mines**  
(iii) Pune - Software Technology Park  
(iv) Tuticorin - Sea port

2022





## Map Practise

(ii) On the same given map of **India**, locate and label the following :

(a) (I) Narora Nuclear Power Plant

**OR**

(II) ~~Bengaluru Software Technology Park~~

1

1





## Map Practise

- (B) Locate and label **any three** of the following with appropriate symbols on the same given outline political map of India :
- (i) Bokaro — Iron and Steel Plant
  - (ii) Gandhinagar — Software Technology Park
  - (iii) Tarapur — Nuclear Power Plant
  - (iv) Salal — Dam
  - (v) Tuticorin — Sea Port





## Map Practise

On the given political outline map of India (on page 11), locate and label the following with appropriate symbols :

- A. Oil Field - Digboi
- B. Iron and Steel Plant - Bhilai
- C. Major Sea Port - Kochi





# Homework

30 (a) Two items A and B are shown in the given political outline political map of India. Identify these items with the help of following information and write their correct names on the lines marked on the map.

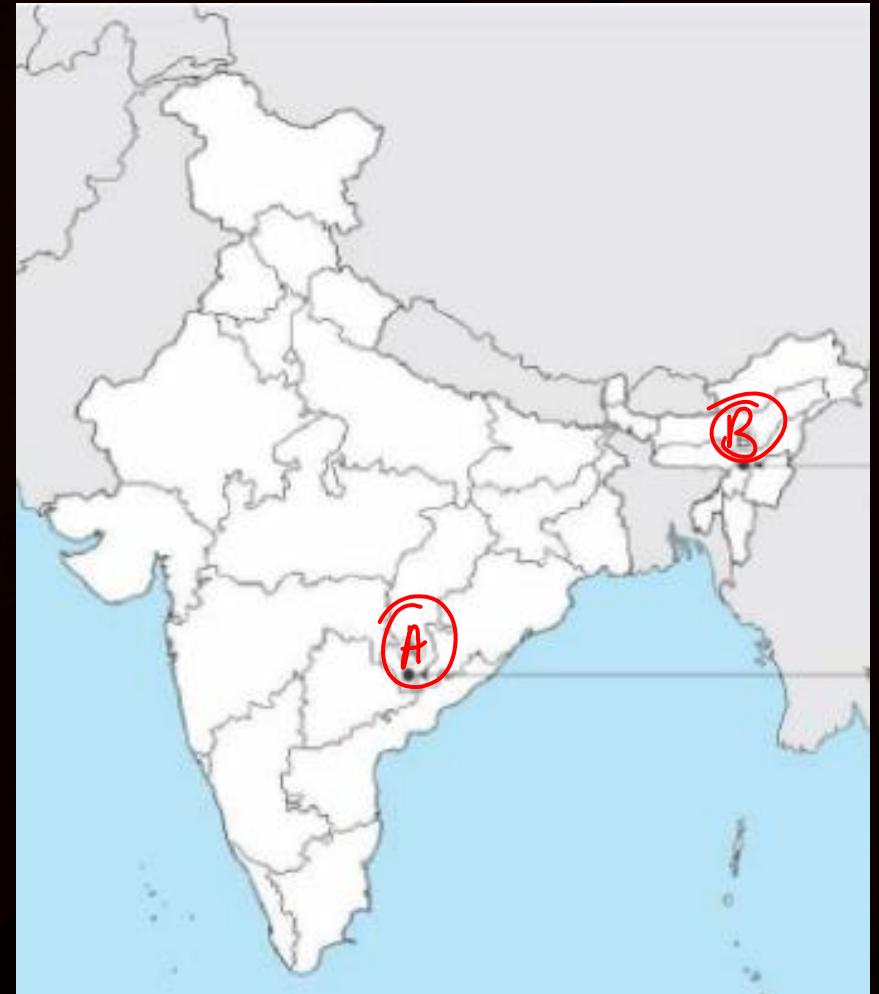
(A) Iron Ore Mines

(B) Terminal Station of East West Corridor

(b) On the same political outline map of India, locate and label the following items with appropriate symbols.

(C) Software Technology Park in Kerala.

[3]



Thank  
You



— Keep Fighting Warriors...