<table>
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<tr>
<th>S. No</th>
<th>News Articles</th>
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*C – Chennai; B – Bengaluru; D – Delhi; T – Thiruvananthapuram; H – Hyderabad
Richard Branson to meet Uddhav to seek clarity on Mumbai-Pune hyperloop

Virgin Group founder says need to see if new govt. is keen on project as old one faltered

Virgin Group founder Richard Branson will meet Chief Minister Uddhav Thackeray on Wednesday to seal an agreement for Virgin’s first-ever hyperloop project that will connect Pune to Mumbai.

The project, expected to cost over ₹1 trillion, will be developed under the “made in India” initiative and will use indigenous technology.

The hyperloop project will be a back-up plan for the Mumbai-Pune high-speed rail project, which is expected to come up in 6-7 years.

To ensure there is no confusion over the hyperloop project’s timeline, the Chhatrapati Shivaji Maharaj International Airport in Mumbai will be the project’s starting point.

Virgln Group’s hyperloop in Las Vegas and Qingdao will start from the city center itself.

The project is expected to be completed in 12 months.

Branson said: “The project will be the world’s first hyperloop project and the first in the world to be developed under the Make in India Initiative.

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Hyperloop Transportation

* new mode of transportation that moves freight and people, quickly and direct from origin to destination
* passenger vehicle floats above track using magnetic levitation
* acceleration done through electric propulsion through a low pressure tube

Part A—Preliminary Examination

Paper I - (200 marks)

- Current events of national and international importance.
- General Science.

Part B—Main Examination

PAPER-IV


- Infrastructure: Energy, Ports, Roads, Airports, Railways etc.
- Science and Technology- developments and their applications and effects in everyday life.
- Conservation, environmental pollution and degradation, environmental impact assessment.

Hyperloop Technology

1. Magnetic Levitation
   a) Floating using magnetic properties
   b) Accelerating through electric propulsion
   - reduces ground-contact friction

2. Use of low-pressure, vacuum sealed environment

To be built on columns/tunnelled below ground
Special features

* Quicker and Faster Transportation (≈ 1100 km/hr)
* Fully autonomous and enclosed
  ▶ elimination of pilot error and weather hazards
  ▶ can operate in any climatic conditions
* Very little energy required to propel
* 5 to 10 times more energy-efficient than an airplane
* Faster than high-speed rails
* Could be powered by renewable energy
  ▶ Solar energy and/or wind energy
  
  Eg: Integration of solar panel technology across the outdoor transport tube system

* Longer lifetime
* Lower operating costs
* Travelling faster or quieter
* Removes pressure from cities
States of persecution

The Citizenship (Amendment) Bill provides protection for citizens to minorities from "persecuted minority communities" in Afghanistan, Bangladesh, and Pakistan. The Bill seeks to protect those who are not recognized as citizens by their country of origin and who are facing persecution. It aims to provide a legal framework for these individuals.

### States of persecution

<table>
<thead>
<tr>
<th>Country</th>
<th>Migrant numbers according to 2019 census</th>
<th>Total migrants (in 1000s)</th>
<th>Total recognized refugees (in 1000s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afghanistan</td>
<td>5,000,000</td>
<td>10,000</td>
<td>0</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>4,000,000</td>
<td>8,000</td>
<td>0</td>
</tr>
<tr>
<td>Pakistan</td>
<td>3,000,000</td>
<td>6,000</td>
<td>0</td>
</tr>
<tr>
<td>Nepal</td>
<td>2,000,000</td>
<td>4,000</td>
<td>0</td>
</tr>
<tr>
<td>India</td>
<td>1,000,000</td>
<td>2,000</td>
<td>0</td>
</tr>
</tbody>
</table>

### Persecution

- **Persecution, International migrants, Refugees, Pew Research Centre — GRI & SHI**
- **Persecution**: Unfair or cruel treatment over a period of time on the grounds of race, religion, political, ethnicity, sexual orientation, gender, social status or political beliefs etc.
- **Migration**
  - Voluntary process
  - In search of better economic opportunities
  - Can return to their home safely

### Refugees

- **Refugees**: Defined and protected in international law
- People outside their country of origin because of feared persecution, conflict, violence, or other circumstances that have seriously disturbed public order

**United Nations High Commissioner for Refugees (UNHCR)**
- UN Refugee Agency
- Dedicated to saving lives, protecting rights and building a better future for refugees
- Guardian of the UN Convention on Refugees
India signed neither → 1951 UN Refugee Convention nor its 1967 Protocol

* As per UN Convention, ‘refugee’ are “unable or unwilling to return to their country of origin owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion”

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Pew Research Centre

* non-partisan fact tank
* operates from Washington D.C
* releases two important indices → GRI & SHI
* Government Restrictions Index (GRI)
  → measures laws, policies and actions by the officials that restrict religious beliefs and practices
* Social Hostilities Index (SHI)
  → measures religious hostility by private individuals, organisations or groups in the society
* 10-point scale

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States of persecution

The Citizenship (Amendment) Bill provides a path for citizenship to minorities (non-Muslims) from three Muslim majority nations – Pakistan, Bangladesh and Afghanistan. Data show that religious minorities, including Muslims, in other neighbouring countries such as Myanmar, China and Sri Lanka also face persecution. In many countries, minority sects within the majority religions (including Islam) are also persecuted. By Vignesh Raghunathana

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1. Migrant numbers

According to UN estimates, there are over 31 lakh international migrants in India as of 2019. Among them, over 2 lakh people were refugees recognized under the 1951 Convention. Most migrants in India are from Bangladesh while most refugees are from Tibet (China).

2. Government restrictions index (GRI) and Social Hostilities Index (SHI) every year. GRI measures laws, policies and actions by officials that restrict religious beliefs and practices. SHI measures religious hostility by private individuals, organisations or groups in the society. GRI and SHI are measured in a 10-point scale. The higher the number, the more the persecution

3. Govt. harassment

The Pew report also records whether there was harassment of religious ethnic groups by government agencies. “Yes” indicates yes. “No” indicates no. For instance, in Myanmar, all communities including ethnic groups such as Buddhists that profess the same religion as the majority (Buddhists) face harassment. In India and Nepal, Dalit persecution was recorded as “1” under Hinduism

UN estimates

* about 51 lakh international migrants in India
* about 2 lakh people were recognised as refugees as per the 1951 Convention

Pew Research Centre

* India: GRI → 5.1
* SHI → 9.7

* In Myanmar, all communities except Jews are facing the harassment
* In India & Nepal → Dalit persecution was recorded as “1” under Hinduism

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Heavy Metals

* Heavy metals – metals with high atomic number, atomic weight and density > 5 g/cm³

* Industries effluents with heavy metals → Water bodies → Heavy Metal Pollution

* 35 metals considered dangerous for human health; 28 are heavy metals

<table>
<thead>
<tr>
<th>Antimony</th>
<th>Gallium</th>
<th>Silver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arsenic</td>
<td>Gold</td>
<td>Tellurium</td>
</tr>
<tr>
<td>Bismuth</td>
<td>Iron</td>
<td>Thallium</td>
</tr>
<tr>
<td>Cadmium</td>
<td>Lead</td>
<td>Tin</td>
</tr>
<tr>
<td>Cerium</td>
<td>Manganese</td>
<td>Uranium</td>
</tr>
<tr>
<td>Chromium</td>
<td>Mercury</td>
<td>Vanadium</td>
</tr>
<tr>
<td>Cobalt</td>
<td>Nickel</td>
<td>Zinc</td>
</tr>
<tr>
<td>Copper</td>
<td>Platinum</td>
<td></td>
</tr>
</tbody>
</table>

* Major lethal effects to human health – few heavy metals – lead, cadmium, mercury and arsenic

* Large amounts → causes acute or chronic toxicity → Various health conditions

* Health Conditions
  - Reduced mental and central nervous functions
  - Modified blood composition
  - Damage to vital organs
**Pollutant** | **Major sources**
---|---
1. Arsenic | Arsenic containing fungicides, pesticides and herbicides, metal smelters, by products of mining activities, chemical wastes
2. Cadmium | Cadmium producing industries, electroplating, welding. Byproducts from refining of Pb, Zn and Cu, fertilizer industry, pesticide manufacturers, cadmium-nickel batteries, nuclear fission plants, production of TEL used as additives in petrol
3. Chromium | Metallurgical and chemical industries, processes using chromate compounds, cement and asbestos units
4. Copper | Iron and steel industry, fertilizer industry, burning of wood, discharge of mine tailings, disposal of fly ash, disposal of municipal and industrial wastes are the sources of copper in the atmosphere
5. Iron | Cast iron, wrought iron, steel, alloys, construction, transportation, machine manufacturing
6. Lead | Automobile emissions, lead smelters, burning of coal and oil, lead arsenic pesticides, smoking, mining and plumbing
7. Mercury | Mining and refining of mercury, organic mercurial's used in pesticides, laboratories using mercury
8. Nickel | Metallurgical industries using nickel, combustion of fuels containing nickel additives, burning of coal and oil, electroplating units using nickel salts, incineration of nickel containing substances
9. Zinc | Zinc refineries, galvanizing processes, brass manufacture, metal plating, plumbing

**Central Water Commission has released ‘Status of Trace and Toxic Metals in Indian Rivers 2019’**

**Study conducted in 67 rivers of 20 river basins**

**River Basins**

Major Basins

1. Indus
2. Godavari
3. Krishna
4. Cauvery
5. Mahanadi
6. Pennar
7. Brahma- Baiharani
8. Ganga - Brahmaputra - Meghna

Composite Basins

1. Sabarmati
2. East Flowing rivers between Mahanadi & Pennar
3. East Flowing rivers between Pennar & Kanyakumari
4. Area of Inland Drainage in Rajasthan Desert
5. West Flowing rivers of Kutch & Saurashtra including Luni
6. West Flowing rivers from Tapi to Padri
7. West Flowing rivers from Padri to Kanyakumari
8. Minor rivers draining into Myanmar & Bangladesh
Q. As per the NSSO 70th Round “Situation Assessment Survey of Agricultural Households”, consider the following statements.

1. Rajasthan has the highest percentage share of agricultural households among its rural households.
2. Out of the total agricultural households in the country, a little over 60 percent belong to OBCs.
3. In Kerala, a little over 60 percent of agricultural households reported to have received maximum income from sources other than agricultural activities.

Which of the statements given above is/are correct?

a) 2 and 3 only
b) 2 only
c) 1 and 3 only
d) 1, 2 and 3
A.P. Cabinet clears Disha Bill to ensure rape verdicts in 21 days

State government will table legislation in the ongoing session of Assembly

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**Tackling crime**

The key aspects of the A.P. Criminal Law (Amendment) Bill, 2019, which will be tabled in the ongoing winter session of the State Legislature:

- **Death penalty** for
  - Rape and gang rape
  - Pedophile and child
  - The amendment will be incorporated in 5 to 14 working days respectively.

- **Judgement time reduced**
  - The time required for Judgement and trial is to be reduced from 14 to 11 working days respectively.

- **Introduction of 104 and 144 working days respectively, where there is a lack of conclusive evidence, and reducing the total duration from 21 days to 14 days for existing rape cases, pre-investigation of complaint and filling of complaint, and the accused being kept in custody up to two years as first conviction and four years as second and subsequent convictions.

- **Under Section 354-A (indecent/sexual assault) the sentencing is increased to a minimum of five years and maximum asven years against those and five years under the IPC 354-A.

- **Specific trial**
  - Chief Minister Y.S. Jagan Mohan Reddy, in an address, said on December 9 that he was for speedy trial of rape cases and ensuring that the trial was completed within 21 days.

- **Welfare schemes**
  - For vulnerable sections of the population by the Centre and States, which include women and children, irrespective of the nature of the harassment of women through social media, while ensuring the swift handling of the Disha Bill case by his Tollywood character K. Chandrashekar Rao.

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**A.P. Disha Bill, 2019**

A.P. Criminal Law (Amendment) Bill, 2019

A.P. Special Court for specified offences against women & children Bill, 2019

**Article 21 → Right to Life and Personal Liberty**

- **Includes Right to Justice**
  - Speedy delivery of justice ensures trust in judicial systems

- **Slow motion syndrome**

**Reasons for delay**

1. Delay in disposition due to high pendency
2. Judge to Population ratio → Poor
3. Disappointing infrastructure in lower courts
4. Provision for adjournment

**Features of these Bills**

1. Death penalty for rape and gang rape
2. Expedite justice delivery → judgment in 21 days
To amend IPC, 1860 and CrPC, 1973

* Section 354 of IPC: Assault on women with an intent to outrage her modesty
* Section 354 E - Harassment of women through social media.
* Section 354 F - Molestation / Sexual assault of children
Practice Question – Prelims

Q1. ‘Government Restrictions Index (GRI)’ is released by
   a) Stockholm International Peace Research Institute (SIPRI)
   b) Pew Research Centre
   c) Reporters Without Borders
   d) UNHCR

Practice Question – Prelims

Q2. Consider the following statements.
   1. The Central Water Commission has its beginning even before the Independence.
   2. National Water Academy functions directly under the guidance of the Chairman of Central Water Commission.

Which of the above statement(s) is/are correct?
   (a) 1 only
   (b) 2 only
   (c) Both 1 and 2
   (d) Neither 1 nor 2

Practice Question – Prelims

Q3. As per the Central Water Commission’s ‘Status of Trace and Toxic Metals in Indian Rivers, 2019’, consider the following statements.
   1. Iron is the most common contaminant found in Indian rivers.
   2. The concentration of sodium chloride is very high in all the rivers in India.
   3. Two-third of water quality monitoring stations sampled for the survey was found polluted by one or more heavy metals.

Which of the above statement/s is/are correct?
   a) 2 and 3 only
   b) 2 only
   c) 1 and 3 only
   d) 1, 2 and 3

Practice Question – Prelims

Q4. Consider the following statements with reference to the Hyperloop Transportation System.
   1. It is operated using the magnetic levitation principle.
   2. It uses Iron Calorimeter Detector.
   3. A hyperloop project has been approved by the Maharashtra State Government for direct connectivity between Mumbai and Pune.

Which of the above statements is/are correct?
   (a) 1 and 3
   (b) 2 and 3
   (c) 1 and 2
   (d) 1, 2 and 3
Practice Question – Prelims

Answers

1. Option (b) - Pew Research Centre
2. Option (c) – Both 1 and 2
3. Option (c) – 1 and 3 only
4. Option (a) – 1 and 3