



Current Affairs for UPSC IAS Exam – 13 & 14 February 2021 | Legacy IAS Academy

Contents

1. Earthquake in Tajikistan: tremors in North India
2. Nanophotonics: Using atomic force microscopy
3. UPSC Advertisises Lateral entry into Central administration
4. Using Robots for the traditional Tholpavakkoothu

EARTHQUAKE IN TAJIKISTAN: TREMORS IN NORTH INDIA

Context:

An earthquake of magnitude 6.3 struck Tajikistan and the impact of the quake was significant enough to be registered in Delhi-National Capital Region.

Relevance:

GS-I: Geography

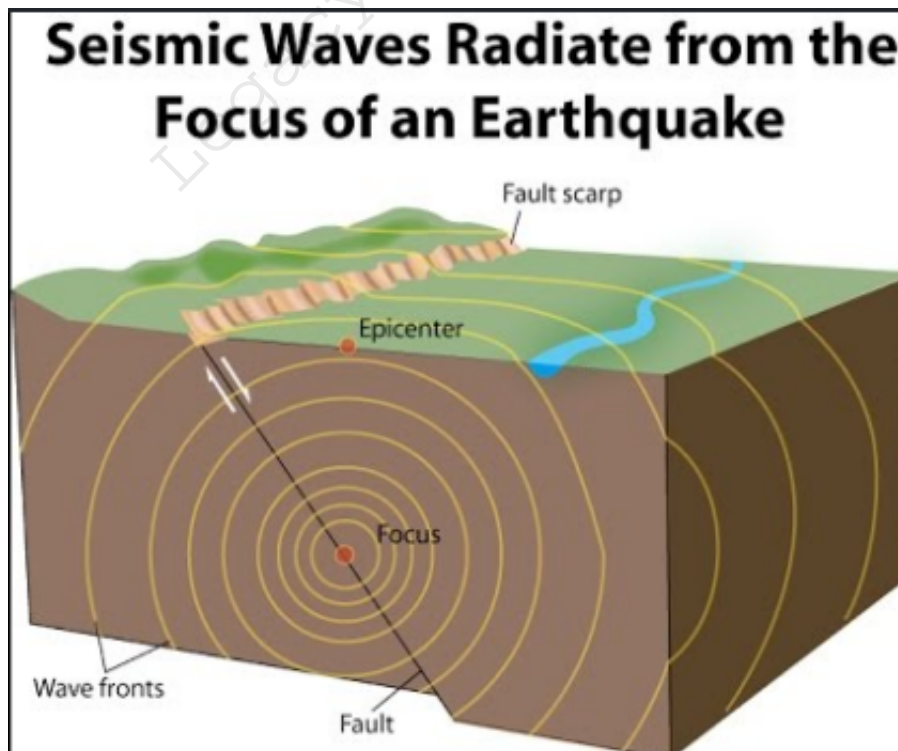
Dimensions of the Article:



1. About Earthquakes
2. Earthquake Waves
3. Measurement of earthquakes
4. About Tajikistan

About Earthquakes

- An earthquake is shaking of the earth. It is a natural event. It is caused due to release of energy, which generates waves that travel in all directions.
- The release of energy occurs along a fault. Rocks along a fault tend to move in opposite directions. This causes a release of energy, and the energy waves travel in all directions.
- The point where the energy is released is called the focus of an earthquake, alternatively, it is called the hypocentre.
- The point on the surface, nearest to the focus, is called epicentre. It is the first one to experience the waves. It is a point directly above the focus.
- All natural earthquakes take place in the lithosphere.



Earthquake Waves



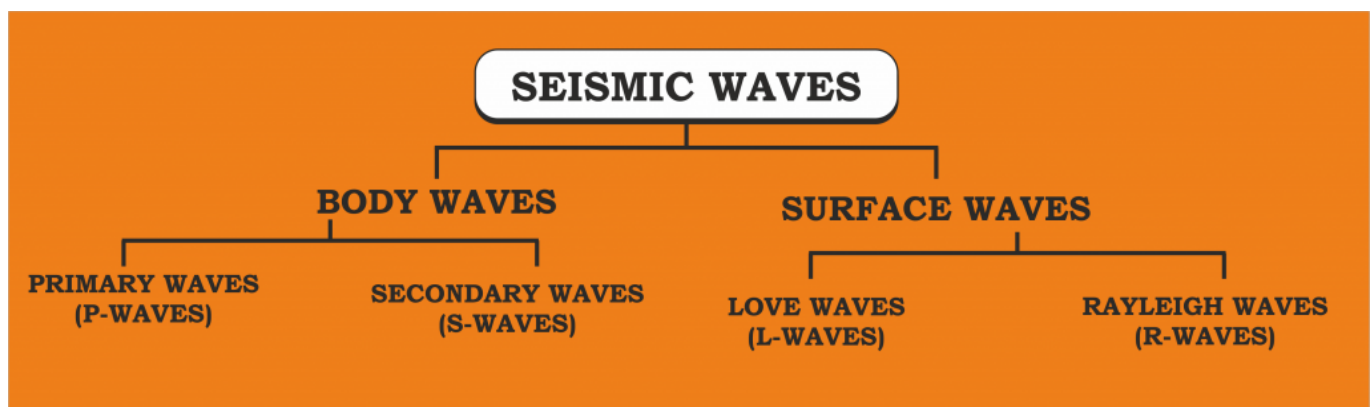
Earthquake waves are basically of two types Body Waves and Surface Waves.

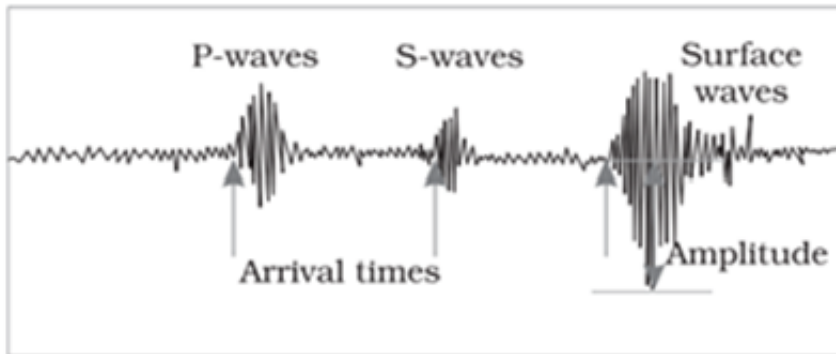
Body waves

- Body Waves are generated due to the release of energy at the focus and move in all directions travelling through the body of the earth.
- There are 2 types of body waves and they are, Primary waves [P] and Secondary [S] waves.
- Primary waves are the first to appear on the surface and hence the name P waves.
- P-waves vibrate parallel to the direction of the wave.
- This exerts pressure on the material in the direction of the propagation.
- P waves can travel through gaseous, liquid and solid materials.
- Secondary waves (S waves) appear after P waves.
- The direction of vibrations of S-waves is perpendicular to the wave direction in the vertical plane.
- Hence, they create troughs and crests in the material through which they pass.

Surface waves

- The body waves interact with the surface rocks and generate new set of waves called surface waves. These waves move along the surface.
- The velocity of waves changes as they travel through materials with different densities. The denser the material, the higher is the velocity.
- Their direction also changes as they reflect or refract when coming across materials with different densities.
- Surface waves are considered to be the most damaging waves.





Measurement of earthquakes

The earthquake events are scaled either according to the magnitude or intensity of the shock.

1. **Richter scale** – The magnitude scale is known as the Richter scale. The magnitude relates to the energy released during the quake. The magnitude is expressed in absolute numbers, 0-10.
2. **Mercalli scale** – The intensity scale is named after Mercalli, an Italian seismologist. The intensity scale takes into account the visible damage caused by the event. The range of intensity scale is from 1-12.
3. **Medvedev–Sponheuer–Karnik scale** – This is a macroseismic intensity scale used to evaluate the severity of ground shaking on the basis of observed effects in an area of the earthquake occurrence.

About Tajikistan

- Tajikistan is a landlocked country in Central Asia which is bordered by Afghanistan to the south, Uzbekistan to the west, Kyrgyzstan to the north and China to the east.
- In 1991, Tajikistan became an independent sovereign nation when the Soviet Union disintegrated.
- Presently Tajikistan is a presidential republic with most of its population belonging to the Tajik ethnic group, who speak Tajik (a dialect of Persian).
- Tajikistan is the smallest nation in Central Asia by area.
- The current economic situation of Tajikistan remains fragile, largely owing to corruption, uneven economic reforms, and economic mismanagement.



-Source: The Hindu

NANOPHOTONICS: USING ATOMIC FORCE MICROSCOPY

Context:

- Scientists in Hyderabad have shown that Crystals, which are normally rigid and stiff



structures, can be sliced and even bent using atomic force microscopy.

- Manipulating them with precision and control comes in very useful in the field of nanophotonics, a qualitative, emerging field where the aim is to go beyond electronics and build up circuits driven entirely by photons (light).
- If the technique can be successfully developed, this can achieve an unprecedented level of miniaturisation and pave the way to all-optical-technology such as pliable, wearable devices operated by light entirely.

Relevance:

Prelims, GS-II: Science and Technology

Dimensions of the Article:

1. What is Nanophotonics?
2. Uses of Nanophotonics

What is Nanophotonics?

- Nanophotonics or nano-optics is the study of the behavior of light on the nanometer scale, and of the interaction of nanometer-scale objects with light.
- It is a branch of optics, optical engineering, electrical engineering, and nanotechnology.
- It often involves dielectric structures such as nanoantennas, or metallic components, which can transport and focus light via surface plasmon polaritons.
- Normal optical components, like lenses and microscopes, generally cannot normally focus light to nanometer (deep subwavelength) scales, because of the diffraction limit (Rayleigh criterion).
- Nevertheless, it is possible to squeeze light into a nanometer scale using other techniques like, for example, surface plasmons, localized surface plasmons around nanoscale metal objects, and the nanoscale apertures and nanoscale sharp tips used in near-field scanning optical microscopy (SNOM or NSOM) and photoassisted scanning tunnelling microscopy.

Uses of Nanophotonics



1. **Optoelectronics and microelectronics:** Small photodetectors, Small lasers, tend to have a variety of desirable properties including low noise, high speed, and low voltage and power.
2. **Photolithography:** Integrated circuits are made using photolithography, i.e., exposure to light. In order to make very small transistors, the light needs to be focused into extremely sharp images.
3. **Solar cells:** Solar cells often work best when the light is absorbed very close to the surface so Researchers have investigated a variety of nanophotonic techniques to intensify light in the optimal locations within a solar cell.
4. **Spectroscopy:** If a given amount of light energy is squeezed into a smaller and smaller volume ("hot-spot"), the intensity in the hot-spot gets larger and larger. This is especially helpful in nonlinear optics and also allows sensitive spectroscopy measurements of even single molecules located in the hot-spot.
5. **Microscopy:** One goal of nanophotonics is to construct a so-called "superlens", which would use metamaterials or other techniques to create images that are more accurate than the diffraction limit.

-Source: *The Hindu*

UPSC ADVERTISES LATERAL ENTRY INTO CENTRAL ADMINISTRATION

Context:

The Union Public Service Commission (UPSC) has issued an advertisement to recruit 30 persons at the Joint Secretary and Director level in the Central administration through Lateral Entry.

Relevance:



Dimensions of the Article:

1. About Lateral Entry
2. Advantages of Lateral Entry
3. Issues with Lateral Entry

About Lateral Entry

- The term lateral entry relates to the appointment of specialists, mainly those from the private sector, in government organisations.
- Government is looking for outstanding individuals, with expertise in revenue, financial services, economic affairs, agriculture, cooperation and farmers' welfare, road transport and highway, shipping, environment, forests and climate change, and new and renewable energy, civil aviation and commerce.

Advantages of Lateral Entry

- People with expertise and specialist domain knowledge are required to navigate the complex needs of present day administrative challenges.
- Lateral entry will help in addressing the problem of shortage of IAS officers at the Centre.
- It will help in bringing the values of economy, efficiency and effectiveness in the Government sector.
- It will help in building a culture of performance within the Government sector.
- In the present times, governance is becoming more participatory and a multi actor endeavour, thus lateral entry provides stakeholders such as the private sector and non-profits an opportunity to participate in the governance process.

Issues with Lateral Entry

- Private sector approach is profit oriented. On the other hand, the motive of Government is public service. This is also a fundamental transition that a private sector person has to



make while working in government.

- It is important to ensure that the people who come in are able to have the skills to adjust to a totally different system of functioning. This is because the government imposes its own limitations.
- The key to the success of this scheme would lie in selecting the right people in a manner which is manifestly transparent.
- Lateral entry is likely to face strong resistance from in service Civil Servants and their associations. It may also demotivate existing officials.
- The movement from the private sector raises issues of potential conflict of interest. Thus, a stringent code of conduct for entrants is required.
- Lateral entry at only top-level policy making positions may have little impact on field level implementation, given the multiple links in the chain of command from the Union Government to a rural village.

-Source: The Hindu

USING ROBOTS FOR THE TRADITIONAL THOLPAVAKKOOTU

Context:

A shadow leather puppet in Kerala's famous temple art Tholpavakkoothu is being animated by a robot.

For the first time, the famous shadow leather puppets will tell stories of the epic Ramayana with the help of robots.

Relevance:

Prelims, GS-I: Art and Culture



Dimensions of the Article:

1. About Tholpavakkoothu
2. Why is Puppetry Art Dying?
3. Major Puppetry Art forms in India

About Tholpavakkoothu

- Tholpavakkoothu is a traditional temple art in Kerala having its roots in Palakkad and neighbouring regions.
- This art is confined largely to Pulavar families from Shoranur region of Palakkad district.
- Among the ancient artforms of Kerala, tholpavakkoothu or shadow puppet play occupies a prominent place. It is a fine example of the integration of Aryan and Dravidian cultures.
- It is a ritual art performed during the annual festivals in the Kaali temples of Palakkad district.
- Ezhupara, Chenda and Maddalam etc., are the various musical instruments that are used.

Why is Puppetry Art Dying?

- Lack of patronage in the modern age.
- Competition from Electronic media which is a preferred mode of entertainment. People find it more appealing to watch mythological stories of Ramayan and Mahabharat on electronic media rather than in Puppetry.
- Puppetry Art is usually confined to only devotional and mythological stories.
- With changing times, Puppetry does not take up modern social issues.
- Puppetry lacks modernization in terms of script, lighting, sound and other stage effects.

Major Puppetry Art forms in India

Glove Puppets



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1. PavaKoothu – Kerala

Rod Puppets

1. Putul Nach – West Bengal
2. Kathi Kandhe – Orissa
3. Yampuri – Bihar

Shadow Puppets

1. Tholu Bommalata – Andhra Pradesh
2. Togalu Gombeyata – Karnataka
3. Tolpavakoothu – Kerala
4. Chamadyache Bahulya – Maharashtra
5. Ravanachhaya – Orissa
6. Thol Bommalattam – Tamil Nadu

String Puppets

1. Putal Nach – Assam
2. Gombeyatta – Karnataka
3. Kalasutri Bahulya – Maharashtra
4. Gopalila Kundhei – Orissa
5. Kathputli – Rajasthan

-Source: The Hindu