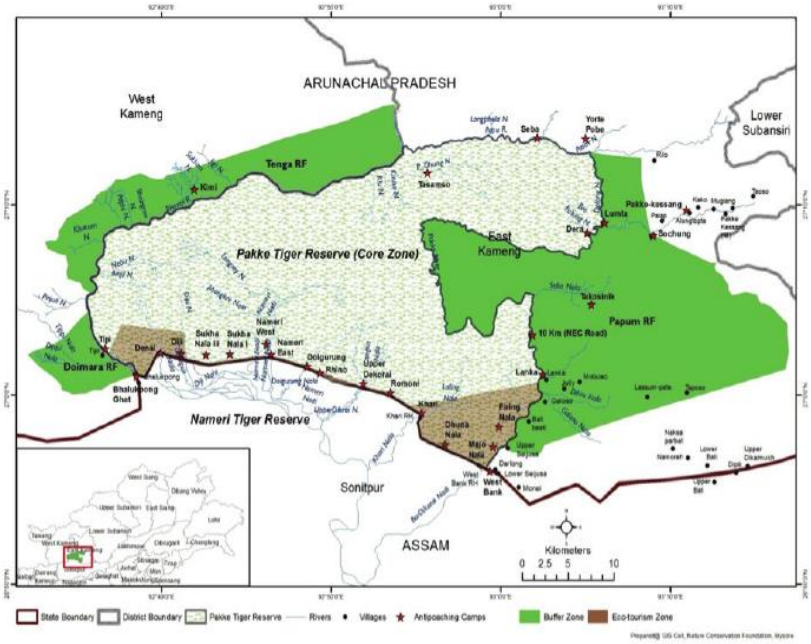
1. Pakke Tiger Reserve

Why in News?

- A new highway project has been cleared through in Pakke Tiger Reserve, which is the India's eastern most Tiger Reserve situated in Arunachal Pradesh.

About Pakke Tiger Reserve:

- Pakke Tiger Reserve, also known as Pakhui Tiger Reserve, is a Project Tiger reserve in the **East Kameng district of Arunachal Pradesh** in northeastern India.
- Previously it was declared a Wildlife sanctuary in 2001, and was declared a Tiger Reserve in 2002.
- This Tiger Reserve has won **India Biodiversity Award 2016** in the category of 'Conservation of threatened species' for its Hornbill Nest Adoption Programme.
- The sanctuary is delineated by rivers in the east, west and north. In addition, the area is drained by a number of small rivers and, perennial streams of the Bhareli and Pakke Rivers, both of which are tributaries of the Brahmaputra.
- The main perennial streams in the area are the Nameri, Khari and Upper Dikorai. The terrain of Pakhui WLS and adjoining areas is undulating and hilly.
- Sessa Orchid Sanctuary and Eaglenest Wildlife Sanctuary are adjacent to Pakke Tiger Reserve on the opposite side of the Kameng River.
- Pakke Tiger Reserve has a subtropical climate with cold weather from November to March.
- It includes semi-evergreen, evergreen forest and Eastern Himalayan broad leaf forests.



2. Habitable-zone Planet Finder (HPF)

Why in News?

- At 100 light-years from Earth, a low-mass star was sending signals in a pattern that suggested that an exoplanet was orbiting the star confirmed the Habitable-zone Planet Finder (HPF).

Habitable-zone Planet Finder:

- NASA's Kepler mission observed a dip in the host star's light, suggesting that the planet was crossing in front of the star during its orbit.
- To confirm, researchers turned to an instrument called Habitable-zone Planet Finder (HPF). It has confirmed that there is indeed an exoplanet.
- HPF is an astronomical spectrograph, built by Penn State University scientists, and recently installed on the 10m Hobby-Eberly Telescope at McDonald Observatory in Texas.
- The instrument is designed to detect and characterize planets in the habitable zone — the region around the star where a planet could sustain liquid water on its surface — around nearby low-mass stars.
- The newly confirmed planet, called G 9-40b, is the first one validated by HPF. It is about twice the size of Earth and orbits its star once every six Earth-days.

How it works:

- A spectrograph is an instrument that splits light into its component wavelengths.
- Scientists then measure the properties of light over a specific portion of the spectrum and draw conclusions on what is responsible for the trends they observe.

Significance:

- Kepler's observations alone were not enough to confirm a planet. It was possible that a close stellar companion was responsible for the dip in the star's light.
- Precision spectroscopic observations from HPF ruled out this possibility.
- Shooting a high-power laser into the air, researchers generated a "laser guide star", and subsequent observations found no evidence of blending of light or other stellar companions.
- Finally, using HPF, an analysis of a set of radial velocities helped provide estimates for the planet's Mass.

3. ASKDISHA Chatbot

Why in News?

- In order to resolve queries of railway passengers over the internet pertaining to various services offered, Indian Railways had introduced the services of Artificial Intelligence-based ASKDISHA chatbot in October 2018 for the benefit of the users.

ASKDISHA Chatbot:

- IRCTC had launched this chat bot to answer various queries about ticket booking, cancellation and various value-added services.
- The chatbot is a special computer programme designed to simulate conversation with users, especially over the internet.
- It was jointly developed by IRCTC and CoRover Private Limited, a Bangalore-based startup.
- The first-of-its-kind initiative by IRCTC is aimed at facilitating accessibility by answering users' queries pertaining to various services offered to railway passengers.

What is the New Update?

- The ASKDISHA Chatbot was initially launched in English language but in order to further enhance the customer services rendered.
- To further strengthen the services of the chatbot, IRCTC has now powered voice-enabled ASKDISHA to converse with customers in Hindi language also in the e-ticketing site irctc.co.in.
- The customers can now ask queries to ASKDISHA in Hindi language by voice as well as text.
- On an average, around three thousand enquiries are being handled by ASKDISHA in Hindi language on daily basis and the figure is increasing day by day which also shows the acceptability of the new feature by the customer.
- IRCTC plans to launch ASKDISHA in more languages along with many other additional features in the near future.

4. Jupiter's atmosphere has more water than Previous Estimates

Why in News?

- A study based on data from NASA's Juno mission showed that water makes up about 0.25% of the molecules in Jupiter's atmosphere along its equator, almost three times that of the Sun.

Highlights:

- The study provided the first findings on the gas giant's abundance of water since the space agency's 1995 Galileo mission.
- According to the researchers, Jupiter may be extremely dry compared to the Sun, a comparison based not on liquid water, but on the presence of its components, oxygen and hydrogen.
- They said Jupiter was likely the first planet to form, and it contains most of the gas and dust that wasn't incorporated into the Sun.
- Water abundance also has important implications for the gas giant's meteorology and internal structure.
- Juno's surprise discovery that the atmosphere was not well mixed even well below the cloud tops is a puzzle that researchers are still trying to figure out. Juno's Microwave Radiometer (MWR) observes Jupiter from above using six antennas that measure atmospheric temperature at multiple depths simultaneously.
- The MWR takes advantage of the fact that water absorbs certain wavelengths of microwave radiation, the same trick used by microwave ovens to quickly heat food.
- The measured temperatures are used to constrain the amount of water and ammonia in the deep atmosphere, as both molecules absorb microwave radiation.
- From its orbital perch, the radiometer was able to collect data from a far greater depth into Jupiter's atmosphere than the Galileo probe, where the pressure reaches about 480 psi.

5. Hypoxia Adaptable Himalayan Wolves

Why in News?

- Himalayan wolves, also called as Tibetan wolves, which live at more than 4,000 metres altitudes are genetically distinct from grey wolves, according to a study.

Highlights:

- The study based on mitochondrial DNA supports an early divergence for the Himalayan wolves, making them the sister taxon to the grey wolves.
- The nuclear genome markers analysed also suggests differences between Himalayan wolves and grey wolves.
- Living at such high altitudes, these wolves have genetically adapted themselves to live in low oxygen (hypoxic) conditions. While effective oxygen availability at sea level is nearly 22%, at 4,000 metres altitude, the effective oxygen availability is nearly half, 12.7%.
- The researchers collected 280 wolf faeces from across the Tibetan Plateau of China, Kyrgyzstan and Tajikistan and studied the mitochondrial DNA. A subset of 110 samples was genotyped too.
- The genetic analysis revealed a clear divergence of Himalayan wolves and marked them as separate breed. Unlike the grey wolves that inhabit the lower elevations the Himalayan wolves showed clear hypoxia adaptation. The admixed wolves had a mixture of genes belonging to Himalayan wolves and grey wolves but always carried the Himalayan wolf hypoxia adaptation.
- The specialised genes for hypoxia adaptation allowed the animals to overcome the lack of oxygen at such high altitudes.
- Such adaptations are seen in dogs and humans to mitigate the deleterious effects of free radicals that are produced in response to low oxygen availability.

- While the precise genetic mechanism that facilitates humans to live in hypoxic conditions remain poorly understood, interbreeding of wolves and dogs is how the dogs might have acquired high-altitude adaptation.

6. Khelo India University Games 2020

Why in News?

- The Prime Minister has recently launched the first-ever Khelo India University Games in Cuttack (Odisha).

About Khelo India University Games:

- It is being launched by the Government of India in association with the Government of Odisha.
- It has been introduced to revive the sports culture in India at the grass-root level by building a strong framework for all sports played in our country.
- It aims to establish India as a great sporting nation. It is implemented by the Ministry of Youth Affairs and Sports.
- It helps to identify talented players in priority sports disciplines at various levels by the High-Powered Committee will be provided annual financial assistance of INR 5 lakh per annum for 8 years. It will have a total of **17 sports** namely archery, athletics, boxing, fencing, judo, swimming, weightlifting, wrestling, badminton, basketball, football, hockey, table tennis, tennis, volleyball, rugby and kabaddi.

7. Kawal Tiger Reserve

Why in News?

- Kawal Tiger Reserve is recently seen in news:

About Kawal Tiger Reserve:

- It is situated in Northern part of the Telangana state.
- The Kawal wildlife sanctuary is the catchment area of river Godavari and Kadam.
- The **indicator species** of the sanctuary are Tiger and Nilgai.
- It is linked to the **Tadoba Andheri Tiger Reserve** in Maharashtra to it north and **Indravati Tiger reserve** to its east
- It has tropical mixed dry deciduous forest and dry teak forest.

8. Yakshagana

Why in News?

- Recently, Arshiya is likely the first woman from the Muslim community in Yakshagana.

About Yakshagana:

- It is a traditional theatre form that combines dance, music, dialogue, costume, make-up, and stage techniques with a unique style and form.
- It literally means the song (gana) of the nature spirits (Yaksha).
- It developed in Udupi, in the state of Karnataka. It is popular in the Karnataka districts of Dakshina Kannada, Kasaragod, Udupi, Uttara Kannada and Shimoga.
- It is strongly influenced by the Vaishnava Bhakti movement. Its stories are mainly drawn from Ramayana, Mahabharata, Bhagavata and other Hindu epics.
- It consists of background music played by a group of musicians (known as the himmela); and a dance and dialog group (known as the mummela), who together enact poetic epics on stage.
- It is traditionally presented from dusk to dawn.