National Supercomputing Mission

French technology firm **Atos** will build a network of 70 supercomputers across India under the **National Supercomputing Mission.**

- The supercomputers will be **manufactured and designed in India**, and will boost India's supercomputing capabilities. However, in terms of the speed, they will **greatly lag those built by China**, the world's largest supercomputer powerhouse.
- The **first three supercomputers** will be set up in **IIT BHU, IIT Kharagpur and IIITM Pune**. While IIT BHU will get a one Petaflop supercomputer, the other two institutes will have 650 Teraflops each.

National Supercomputing Mission

- The National Supercomputing Mission was **announced in March 2015**, with an aim to connect **national academic and R&D institutions with a grid of more than 70 high-performance computing facilities** at an estimated cost of **₹4,500 crore** over the period of **seven years.**
- It supports the government's vision of '**Digital India**' and '**Make in India**' initiatives.
- The mission will be implemented by the **Department of Science and Technology (Ministry of Science and Technology)** and **Ministry of Electronics and Information Technology (MeitY)**, through the **Centre for Development of Advanced Computing (C-DAC) and Indian Institute of Science (IISc), Bengaluru.**
- These supercomputers will also be networked on the National Supercomputing grid over the National Knowledge Network (NKN). The NKN connects academic institutions and R&D labs over a high speed network.
- Under NSM, the long-term plan is to **build a strong base of 20,000 skilled persons** over the next five years who will be equipped to handle the complexities of supercomputers.
- **PARAM Shavak** is one such machine that has been deployed to provide training.

Advantages

- These supercomputers will **meet the increasing computing demand of the scientific and academic community** in the country, international technology trends and roadmaps of leading countries in the area, strategic importance and emergence of supercomputing as a benchmark for Scientific & Technological advancements.
- These machines will be part of the **National Supercomputing grid over the National Knowledge Network (NKN),** which will have wide-scale applications in the fields of **climate modelling, weather prediction, aerospace engineering , computational biology, molecular dynamics, atomic energy simulations, national security and defence applications, seismic analysis, disaster prediction and management, computational chemistry, big data analytics, finance and more.**

Supercomputers in India

- India's supercomputer program was started in **late 1980s because Cray supercomputers** could not be imported into India due to an **arms embargo imposed on India,** as it was a dual-use

technology and could be used for developing nuclear weapons.

- This led to setting up the **Centre for Development of Advanced Computing (C-DAC) in March 1988** with the clear mandate to develop an indigenous supercomputer to meet high-speed computational needs.
- **PARAM 8000,** considered to be India's first supercomputer was **indigenously built in 1991** by the Centre for Development of Advanced Computing (C-DAC).
- Presently, **Pratyush, a Cray XC40 system -** an array of computers that can deliver a **peak power of 6.8 petaflops,** installed at the **Indian Institute of Tropical Meteorology (IITM), Pune,** is the fastest supercomputer in India. Launched in January 2018, it is the **fourth fastest High Performance Computer (HPC) dedicated to climate modelling in the world.**

Way Forward

- The biggest challenge for India is **limited funding.** Limited investments and delayed release of funds slowed things down further.
- This is one of the main reasons why India, which has the capacity to build a world-class system, has never reached the top position in the rankings.
- While India's stronghold is in the field of software development, it has to depend on imports to procure the hardware components required for building supercomputers.
- But the situation is changing, with India now venturing into design, manufacture and assembly of hardware components. This will not only cut down import costs, it will also ensure that while assembling supercomputers, applications are tailored to address problems that are specific to India.

President's Visit To Myanmar

Recently President of India visited Myanmar.

- It is the first visit by the President to Myanmar since assuming office.

Highlights of the visit

- A number of Memorandums of Understanding were signed between both the sides in the areas of judicial and education cooperation.
- There was also the announcement of visa on arrival facility for Indian tourists by the Myanmar government.
- Both sides agreed to sign at the earliest the MoU for Cooperation on Combating Timber-Trafficking and Conservation of Tigers and Other Wildlife.

India-Myanmar Relations

- **Geopolitical**: India shares a long **land border of over 1600 Km** with Myanmar **as well as a maritime boundary** in the Bay of Bengal.
    - Four north-eastern states viz. Arunachal Pradesh, Nagaland, Manipur and Mizoram share boundary with Myanmar.
- **Commercial Cooperation:** A bilateral Trade Agreement was signed in 1970. Bilateral trade has been growing steadily to reach US$2.1 billion (2016-17), of which Indian exports amounted to US$1.1 billion and Indian imports to US$1 billion.
    - **India is the fifth largest trading partner of Myanmar** but trade remains below potential.
- **Cultural Relations:** India and Myanmar share **close cultural ties given India's Buddhist heritage.** Building on this shared heritage India has undertaken some key initiatives: Restoration of the Ananda Temple in Bagan and donation of a 16-foot replica of the Sarnath Buddha Statue

which has been installed at the premises of Shwedagon pagoda in Yangon.
    - The Archaeological Survey of India (ASI) is working to preserve and restore stone inscriptions and temples of King Mindon and King Bagyidaw of Myanmar in Bodh Gaya.

Indian Projects in Myanmar

- **India-Myanmar-Thailand Trilateral Highway**
    - A number of infrastructure projects are underway. This includes the Trilateral Highway which will eventually connect **India to Thailand through Myanmar.**
- **Kaladan Multimodal Project**
    - The Kaladan Multi-Modal Transit Transport Project was jointly identified by the India and Myanmar to create a multi-modal mode of transport for shipment of cargo from the eastern seaport of India to Myanmar and to the North-Eastern part of India through Myanmar.
    - This **project connects Sittwe Port in Myanmar to the India-Myanmar border, is expected to contribute to the economic development of the North-Eastern States of India.** It is also an alternate route to India's North-East bypassing the Siliguri Corridor.
- **Projects in Rakhine State**
    - India had signed a memorandum of understanding (MoU) with Myanmar for improving the socioeconomic condition of the people belonging to Myanmar's Rakhine state under the aegis of **Rakhine State Development Programme.**
- **Other Projects**
    - India is also working on the Rhi-Tiddim road; supply of Bailey bridges; assistance for border area development by financing bridges, roads, schools, and health centers; assistance in higher learning and research, Myanmar-India Entrepreneurship Development Centre etc.

Importance of Myanmar for India

- India's **Act East Policy and Neighbourhood first policy** interacts at Myanmar.
- Myanmar is the **member of both** Association of Southeast Asian Nations (ASEAN), which is an organization of East Asian nations as well as **Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC)** which bridges South and South-East Asia.
- Connectivity projects through Myanmar help India overcome its **Chicken-neck dilemma (Siliguri Corridor).**
- Myanmar is also necessary for the **development of North Eastern India.**
- Myanmar is a close neighbor and **only ASEAN country to which we are linked by land and sea.**

Information Fusion Center of Indian Navy

The Indian Navy will inaugurate the **Information Fusion Centre (IFC) for the Indian Ocean Region (IOR).**

- The Information Fusion Centre will serve countries that have **White Shipping Information Exchange** (White-shipping refers to commercial shipping information about the movement of cargo ships) agreements with India.
- The IFC-IOR is established with the **vision of strengthening maritime security** in the region, by building a **common coherent maritime situation picture** and acting as a **maritime information hub** for the region.
- The IOR apart from being **heavily militarized ocean** also faces **threats like maritime terrorism, piracy, arms-running, human trafficking.**

Information Fusion Centre (IFC)

- The IFC has been established at the Indian Navy's **Information Management and Analysis Centre (IMAC) in Gurugram, Haryana.**
- IFC is the single point center **linking all the coastal radar chains** to generate a **seamless real-time picture** of the nearly 7,500-km coastline.
- All countries that have signed white shipping information exchange agreements with India can now position liaison officers at the IFC.
- The IFC-IOR is a separate platform and all members of the **Indian Ocean Naval Symposium are expected to be part of it.** The IONS, launched in 2008, seeks to increase maritime cooperation in IOR.

Significance

- Information on commercial shipping will be exchanged with countries in the region to **improve maritime domain awareness** in the Indian Ocean.
- It will strengthen the **mutual collaboration and understanding of the threats prevalent in the region.**

Trans-Regional Maritime Network (T-RMN)

- Recently, India has also signed the Trans Regional Maritime Network (T-RMN) agreement.
- The multilateral agreement **comprises of 30 countries and is steered by Italy.**
- This will facilitate information **exchange on the movement of commercial traffic** on the high seas.
- Under the T-RMN, information is available mainly through the **Automatic Identification System (AIS),** fitted on the merchant ships as mandated by the International Maritime Organisation.
- The AIS is used to identify passenger and commercial ships in international waters. AIS comprises the name, number, position, course, speed, last port visited, destination etc.
- Such multilateral agreements help Indian Navy monitor whole Indian Ocean. As due to the large traffic, the Indian Ocean cannot be entirely monitored by any one nation.

Information Management and Analysis Centre (IMAC)

- The Information Management and Analysis Centre (IMAC) is **located in Gurugram.**
- It is the **main center of the Indian Navy for coastal surveillance and monitoring.**
- IMAC is the nodal center of the **National Command Control Communications and Intelligence Network (NC3I Network).**
- IMAC is a joint initiative of Indian Navy, Coast Guard and Bharat Electronics Ltd. and functions under the **National Security Adviser (NSA).**

National Command Control Communication and Intelligence Network (NC3IN)

- The Indian Navy has established the NC3IN linking 51 stations, including 20 of the Navy and 31 of the Coast Guard, with a nodal Information Management and Analysis Centre (IMAC).
- The NC3I links 20 naval and 31 Coast Guard monitoring stations to generate a seamless real-time picture of the nearly 7,500-km long coastline.

Important Facts for Prelims (17th December 2018)

Great Indian Bustard

- The population of Great Indian Bustard has significantly shrunk to less than 150 in **five States (Rajasthan, Gujarat, Maharashtra, Karnataka and Andhra Pradesh)**. India is the only

country that habitats the Great Indian Bustard.

Threats

- **Hunting:** The bird was a **popular game bird** and still is in some pockets.
- **Agriculture:** Habitat of bustards are categorised as ‘wastelands’, like most grassland habitats in India. The **push to make these areas more ‘productive’ has seen an increase in irrigation facilities** in these parts, resulting in the spillover of agricultural land into bustard habitats. Intensification of agriculture, including more pesticides, barbed-wire fences and new crops are endangering the birds’ survival.
- **Development :** Their habitat grassland are now sites for renewable power projects. New wind turbines and more power line affect the flight of Bustards as they have poor frontal vision and heavy bodies.

Markermeer Lake

- Markermeer is one of **Europe’s largest Freshwater Lake** and is located in **the Netherlands.**
- An artificial archipelago is being built on Markermeer Lake **from the sediments in the lake to bring wildlife back**.
- These islands are named as Marker Wadden Islands. These **'Marker Wadden' will form a unique ecosystem** that will boost biodiversity in the region.
