

<p>The Cancer Genome Atlas Program (TCGA)</p>	<ul style="list-style-type: none"> • TCGA is a cancer genomics program of the US-India which began in 2006 bringing together researchers from diverse disciplines and multiple institutions. • Over the years, TCGA generated over 2.5 petabytes of genomic, epigenomic, transcriptomic, and proteomic data. These data led to improvements in the ability to diagnose, treat, and prevent cancer. • On similar lines, the establishment of an 'Indian Cancer Genomics Atlas (ICGA)' has been initiated by a consortium of key stakeholders in India led by CSIR.
<p>73rd World Health Assembly (WHA)</p>	<ul style="list-style-type: none"> • WHA had unanimously adopted a resolution that seeks to- <ul style="list-style-type: none"> ○ Establish the origins of the novel coronavirus ○ Impartial, independent and comprehensive evaluation on the response of the World Health Organisation (WHO) to the coronavirus crisis. <p>About WHA</p> <ul style="list-style-type: none"> • It is the decision-making body of WHO. • It is attended by delegations from all WHO Member States and focuses on a specific health agenda prepared by the Executive Board. • Main functions: to determine policies of Organization, appoint Director-General, supervise financial policies, and review and approve the proposed programme budget. • It is held annually in Geneva, Switzerland.
<p>Toxin in Hand sanitizer</p>	<ul style="list-style-type: none"> • United States Food and Drug Administration announced presence of 1-propanol in hand sanitisers. • 1-propanol is toxin that can depress the central nervous system and can be life-threatening if ingested. • 1-propanol is a primary alcohol and is used in the manufacture of products including pharmaceuticals, cosmetics, rubbing alcohols, and other chemicals and commercial goods.

FAST TRACK COURSE 2021

GENERAL STUDIES PRELIMS

PURPOSE OF THIS COURSE

The GS Prelims Course is designed to help aspirants prepare for & increase their score in General Studies Paper I. It will not only include discussion of the entire GS Paper I Prelims syllabus but also that of previous years' UPSC papers along with practice & discussion of Vision IAS classroom tests. Our goal is that the aspirants become better test takers and can see a visible improvement in their Prelims score on completion of the course.

INCLUDES

- Access to recorded live classes at your personal student platform.
- Comprehensive, relevant & updated Soft Copy of the study material for prelims syllabus.
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- Sectional mini test and Comprehensive Current Affairs.

COURSE BEGINS	TOTAL NO OF CLASSES
Admission Open	60

8. DEFENCE

8.1. COASTAL RADAR NETWORK

Why in News?

India is planning at integrating more countries into coastal radar network.

More on News

- Efforts are in advanced stages to set up coastal radar stations in **Maldives, Myanmar, Thailand and Bangladesh**
 - **Mauritius, Seychelles and Sri Lanka have already been integrated** into the country's coastal radar chain network.
- **Integration is being done on mainly two platforms:**

Indian Navy's Information Management and Analysis Centre (IMAC)	<ul style="list-style-type: none"> • IMAC, located in Gurugram, was set up after the 26/11 Mumbai terror attacks and is the nodal agency for maritime data fusion. • IMAC is jointly operated by the Navy and Coast Guard and is the cornerstone of the National Command Control Communication and Intelligence Network for monitoring maritime traffic in India's area of interest. <ul style="list-style-type: none"> ○ It focuses on ships passing through Indian Ocean Region. ○ IMAC tracks only non-military or commercial ships, known as white shipping. Military ships, or grey hull ships, are tracked by the Directorate of Naval Operations. • Navy has been authorised to conclude white shipping agreements with 36 countries and three multilateral constructs.
Navy's Information Fusion Centre for the Indian Ocean Region (IFC-IOR)	<ul style="list-style-type: none"> • IFC-IOR is meant to promote Maritime Domain Awareness. It has been established at Gurugram. • IFC-IOR had established itself as the hub of maritime security information in the IOR through white shipping exchange agreements with 21 countries and 20 maritime security centres. • IFC is jointly administered by the Indian Navy and Indian Coast Guard.

8.2. DIGITAL OCEAN

Why in News?

Recently, web-based application Digital Ocean was launched.

About Digital Ocean

- Digital Ocean is a state of the art data platform to **provide ocean data related services at one place.**
 - It includes a set of applications developed to **organize and present heterogeneous oceanographic data** by adopting rapid advancements in geospatial technology.
- It has been **developed by the Indian National Centre for Ocean Information Services (INCOIS)** of the Ministry of Earth Science.
 - **INCOIS provides ocean information and advisory services to various stakeholders**, including Potential Fishing Zone advisories, Ocean State Forecast, high wave alerts, tsunami early warnings, etc.
 - It is a unit of the Earth System Science Organization (ESSO), an executive arm of the Ministry of Earth Science to develop and improve capability to forecast, weather, climate and hazard related phenomena.
- **Significance of the 'Digital Ocean'**
 - It will serve as a **one stop-solution for all the data related needs** of a wide range of users.
 - Data from **various projects like Deep Ocean Mission, 'Samudrayaan' project**, research on alternative sources of energy, etc would be included.
 - It will help to **assess the evolution of oceanographic features** through 3D and 4D data visualization.

INDIA'S PROJECTS ON OCEANS

- **'Deep Ocean Mission' envisages exploration of minerals, energy and marine diversity** of the underwater world, a vast part of which still remains unexplored. It is yet to be launched.
- **'Samudrayaan' project** proposes to send a submersible vehicle with three persons to a depth of about 6000 metres to carry out deep underwater studies.

8.3. MISSILES, SUBMARINE AND SHIPS

Missiles	
Akash Missile system	<ul style="list-style-type: none"> Cabinet approved export of indigenously developed Akash missile systems to friendly countries. It is a mid-range surface-to-air missile (SAM) system built by DRDO. It was developed under the integrated guided-missile development programme (IGMDP). <ul style="list-style-type: none"> The programme also involved the development of the Nag, Agni and Trishul missiles, as well as the Prithvi ballistic missile. Two versions of the missile have been built for the Indian Air Force and the Indian Army.
Akash-NG Missile	<ul style="list-style-type: none"> Recently, DRDO successfully conducted the maiden test of the New Generation Akash missile (Akash-NG). Akash-NG is a new generation Surface to Air Missile meant for use by Indian Air Force with an aim of intercepting high manoeuvring low RCS (Radar Cross Section) aerial threats.
NAG Missile	<ul style="list-style-type: none"> The final user trial of Nag was successfully carried at the Pokhran range in Rajasthan. It is India's third-generation, anti-tank guided missile. Features: All-weather, fire-and-forget, lock-on after launch, with an operational range of 500 m to 20 km. It has a single-shot hit probability of 90%.
Anti-radiation missile- Rudram	<ul style="list-style-type: none"> It is first indigenous anti-radiation missile developed by DRDO. Anti-radiation missiles are designed to detect, track and neutralise the adversary's radar, communication assets and other radio frequency sources, which are generally part of their air defence systems. It can be launched from a height ranging from 500 metres to 15 km. With this, IAF now has the capability to perform SEAD (Suppression of Enemy Air Defence) operations deep into enemy territory to destroy enemy air defence setup.
Brahmos Supersonic Cruise Missile	<ul style="list-style-type: none"> India successfully test-fired land-attack version of BrahMos supersonic cruise missile. <ul style="list-style-type: none"> Supersonic includes speeds up to five times faster than the speed of sound. Cruise missiles are Self-propelled till the end of flights and are used to deliver large warhead over long distance with high precision. The range of the new land-attack version has been extended to 400 km from 290 km but speed has been maintained at 2.8 Mach. BrahMos Aerospace, is an India-Russian joint venture to produce lethal weapons that can be launched from submarines, ships, aircraft and land platforms. Air-launched version and Naval version of the BrahMos missile were also successfully test fired.
Medium-Range Surface-to-Air (MRSAM) Missile	<ul style="list-style-type: none"> MRSAM, developed by the DRDO in collaboration with Israel Aerospace Industries (IAI) for Army has been tested successfully The propulsion system, coupled with a thrust vector control system, allows the missile to move at a maximum speed of Mach 2. The weapon has the ability to engage multiple targets simultaneously at ranges of 70km. In May 2019, Indian Navy, DRDO and IAI successfully tested Naval version of MRSAM.
Dhruvastra anti-tank guided missile	<ul style="list-style-type: none"> It is a helicopter-launched Nag Missile (HELINA), also known as 'Dhruvastra'. It is a third-generation fire-and-forget-class missile and uses an imaging infrared seeker in lock-on-before-launch mode. It is indigenously developed by DRDO.
Prithvi-II missile	<ul style="list-style-type: none"> Recently India conducted a successful night test fire of its indigenously developed nuclear capable surface-to-surface Prithvi-II missile. <ul style="list-style-type: none"> Prithvi-II is capable of carrying 500 to 1,000 kg of warheads.
Quick Reaction Surface-to-Air Missile (QRSAM) System	<ul style="list-style-type: none"> QRSAM is a short-range surface-to-air missile system, indigenously designed and developed. It provides a protective shield to moving armoured columns of the Army from enemy aerial attacks. It has a range of 25 to 30 km.
Shaurya Missile	<ul style="list-style-type: none"> India successfully test fired its indigenously developed nuclear capable hypersonic missile 'Shaurya' with a strike range of around 1,000 km. Shaurya is a canister-based system, which means that it is stored and operated from specially designed compartments.

	<ul style="list-style-type: none"> Shaurya is a land-based parallel of the submarine launched K-15 missile. <ul style="list-style-type: none"> The K family of missiles are primarily Submarine Launched Ballistic Missiles, which have been indigenously developed by DRDO and are named after DrKalam.
S-400	<ul style="list-style-type: none"> India is set to get S-400 air defence missile system from Russia. <ul style="list-style-type: none"> It is Russia's fourth generation of long-range surface-to-air missile system capable of firing three types of missiles to create a layered defence. The system can engage all types of aerial targets including aircraft, unmanned aerial vehicles (UAV), ballistic and cruise missiles within the range of 400km, at an altitude of up to 30km.
Stand-off Anti-tank (SANT) Missile	<ul style="list-style-type: none"> India has successfully test-fired air-to-surface SANT missile from a roof-top launcher at the Integrated Test Range (ITR). SANT missile is an upgraded version of the Helicopter Launched Nag (HeliNa) missile, equipped with an advanced nose-mounted seeker. It is developed by DRDO for the Indian Air Force (IAF). It will have both Lock-on After Launch and Lock-on Before Launch capability.
Submarines	
P-75 I	<ul style="list-style-type: none"> Indian Navy is set to acquire 24 new submarines under the Mega Project which has been named P-75 I. Presently the Indian Navy is operating two different types of submarines — Russian Kilo-class and German Type 209 conventional submarines. And one 'Scorpene' class submarine is the new one inducted in the Indian Navy.
Scorpene Class Submarine Vagir	<ul style="list-style-type: none"> It is the fifth among the six Kalvari-class submarines being constructed by Mazagon Dock Ltd. Other vessels in the class are INS Kalvari, INS Khanderi, INS Karanj, INS Vela and INS Vagsheer (under construction). Design of Kalvari class of submarines, a class of diesel-electric attack submarines, is based on Scorpene class of submarines with technology transfer from France.
Ships and Other Vessels	
INS Vikrant	<ul style="list-style-type: none"> It is India's first domestically built aircraft carrier. It is lead ship of the Indian Navy's Vikrant-class, to be designed and built in India under Indigenous Aircraft Carrier (IAC) program. It operates a ski-jump assisted Short Take-Off But Arrested Recovery (STOBAR) launch systems for launching aircraft and is capable of accommodating MiG 29K fighter jets and helicopters. INS Vishal, also known as Indigenous Aircraft Carrier 2 (IAC-2), is to be the second aircraft carrier to be built in India after INS Vikrant (IAC-1). INS Vikramaditya (India's only active aircraft carrier) is Indian Navy's largest short take-off, but assisted recovery (STOBAR) aircraft carrier, converted from the Russian Navy's decommissioned vertical take-off and landing (VTOL) missile cruiser carrier.
Indian Naval Ship (INS) Viraat	<ul style="list-style-type: none"> To be scrapped at ship breaking yard at Alang in Gujarat. <ul style="list-style-type: none"> Alang in Gujarat is the world's biggest ship breaking yard It was decommissioned in 2017 after 30 years of service with Indian Navy and around 27 years prior to that in British Royal Navy. Used in Op Parakram, post terrorist attack on Parliament (2001-02)
Fast Patrol Vessel (FPV) ICGS Kanaklata Barua	<ul style="list-style-type: none"> It is the fifth and last in a series of FPV built by Garden Reach Shipbuilders and Engineers Ltd. <ul style="list-style-type: none"> Other four are ICGS Priyadarshini (named after Indira Gandhi), ICGS Annie Besant, ICGS Kamala Devi (after Kamala Devi Chattopadhyay), and ICGS AmritKaur. It is named after a teenage freedom fighter who was shot dead in Assam during the Quit India Movement. These FPVs are upgraded versions of the inshore patrol vessels. These are suited for patrolling, maritime surveillance, anti-smuggling, anti-poaching operations and also for fishery protection, and rescue and search missions.
Project 17A	<ul style="list-style-type: none"> Under Project 17A program, a total of seven ships (guided missile frigates) are being built with enhanced stealth features, advanced indigenous weapon and sensor fit along with several other improvements. Recently, Indian Navy's 2nd Project 17A Frigate 'Himgiri' was launched by India's shipbuilder Garden Reach Shipbuilders and Engineers Limited.
INS Kavaratti	<ul style="list-style-type: none"> INS Kavaratti has been commissioned in the Indian Navy.

	<ul style="list-style-type: none"> It is the last of the 4 indigenously built Anti-Submarine Warfare (ASW) stealth corvettes built under Project 28 (Kamorta class) by Garden Reach Shipbuilders & Engineers (GRSE), Kolkata. <ul style="list-style-type: none"> It joins 3 other ships of the same class namely- INS Kamorta, INS Kadmatt and INS Kiltan. It is named after the capital of the Lakshadweep group of islands. It has 90% indigenous content with the state-of-the-art equipment and systems to fight in Nuclear, Biological and Chemical warfare conditions.
Others	
Rafale fighter jets	<ul style="list-style-type: none"> Rafale is a French twin-engine multi-role fighter jet designed and built by Dassault Aviation. <ul style="list-style-type: none"> It can carry out all combat aviation missions: air superiority and air defence, close air support, in-depth strikes, reconnaissance, anti-ship strikes and nuclear deterrence. India France signed agreement in 2016 for supply of 36 Rafale multi-role fighter jets.
Light Combat Aircrafts (LCA) Tejas	<ul style="list-style-type: none"> Cabinet approved procurement of 83 LCA Tejas from Hindustan Aeronautics Limited (HAL) for IAF. <ul style="list-style-type: none"> It is the first Buy (Indian-Indigenously Designed, Developed and Manufactured) category procurement of combat aircrafts with an indigenous content of 50%. Tejas is an indigenously designed, developed and manufactured state-of-the-art modern 4+ generation fighter aircraft. It is equipped with operational capabilities like Active Electronically Scanned Array Radar, Beyond Visual Range Missile, Electronic Warfare Suite and Air to Air Refuelling.
Pinaka	<ul style="list-style-type: none"> Recently the first ever pinaka rockets fully manufactured by the private sector have been successfully test fired by the army. Pinaka is indigenous multi barrel rocket launch system developed by DRDO. Each Pinaka rocket is capable of carrying a 100kg payload for a range of 40km.
ABHYAS	<ul style="list-style-type: none"> Abhyas is a High-speed Expendable Aerial Target (HEAT) which is designed and developed by DRDO. It is an unmanned aerial vehicle based on indigenously developed micro electromechanical systems (MEMS) navigation system.
Smart Anti-Airfield Weapon (SAAW)	<ul style="list-style-type: none"> DRDO successfully test fired SAAW from Hawk-1 jet of Hindustan Aeronautics Limited (HAL). SAAW is indigenously designed stand-off weapon developed capable of engaging ground enemy airfield assets such as radars, bunkers, taxi tracks, and runways etc. up to a range of 100 kms.
Supersonic Missile Assisted Release of Torpedo (SMART)	<ul style="list-style-type: none"> DRDO has successfully flight-tested SMART. It will have a range of over 600 km. SMART is a Torpedo System for Anti-Submarine Warfare (ASW) operations far beyond Torpedo range. Torpedo is a weapon consisting of a self-propelled, self-guided, cigar-shaped underwater projectile that carries a conventional or nuclear warhead.
Varunastra	<ul style="list-style-type: none"> Varunastra is a ship launched, heavy weight, electrically-propelled anti-submarine torpedo which is capable of targeting quiet submarines, both in deep and shallow waters. The weapon has a range of 40 kilometers, can travel at a speed of up to 70 kilometers per hour and dive to a maximum depth of 400 meters. It is developed by DRDO.

8.4. BIO-TERRORISM

Why in news?

Parliamentary panel has **highlighted the need for the government to have laws to counter bio-terrorism** in its report 'The Outbreak of Pandemic COVID-19 and its Management'.

About bio-terrorism

- Bioterrorism is a planned and deliberate use of pathogenic strains of microorganisms** such as bacteria, viruses, or their toxins to spread life-threatening diseases on a mass scale in order to devastate the population of an area.
- Bioterrorism agents are classified as categories A, B, and C.**
 - Category A:** High-priority agents that pose a risk to national security because they can be easily disseminated or transmitted from person to person, result in high mortality rates. Eg. Anthrax by Bacillus anthracis, botulism by Clostridium botulinum toxin, plague by Yersinia pestis etc.