MISSION X

Innovation in Learning

X TECH WEEKLY

SCIENCE & TECHNOLOGY CURRENT AFFAIRS

28 Oct to 3 Nov 2026

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AGRICULTURE

1

NIPGR Shows How Plants Relay an Insect Attack Alarm

NEWS IN BRIEF



- Scientists at the National Institute of Plant Genome Research (NIPGR), New Delhi, reported that a calcium channel called CNGC13 helps carry an insect attack alarm from a chewed leaf to undamaged leaves (PNAS, 2026).
- The team led by Dr Jyothilakshmi Vadassery used the model plant Arabidopsis thaliana attacked by caterpillars of Spodoptera litura, the common cutworm.
- CNGC13 sits in vascular tissue and is switched on strongly by wounding. It acts as a positive regulator of defence against the caterpillars.
- The alarm travels as a calcium signal, after which the defence hormone jasmonic acid is produced in distant leaves.
- NIPGR is an autonomous institute under the Department of Biotechnology, now part of BRIC. Its other work includes gene-edited rice with better phosphate uptake and a salinity tolerant chickpea.

KEY CONCEPTS EXPLAINED

Calcium signalling
Plants raise cytosolic calcium as a first alarm after wounding. Channels act as gates that let calcium into the cell.

Jasmonic acid
Defence hormone made after wounding or herbivory that switches on defence genes.

Model organism
Arabidopsis thaliana is a small mustard family plant with a short life cycle and a fully sequenced genome, widely used to study gene function.

UNIQUE FACT

NIPGR was set up in 1998 to succeed the Plant Genome Research Unit at JNU, New Delhi.

EXAM TRAP

NIPGR works under the Department of Biotechnology (BRIC), not ICAR or CSIR. CNGC13 is a calcium channel, not a hormone or a potassium channel.

PRELIMS MEMORY BANK

NIPGR: New Delhi | DBT / BRIC | CNGC13 = Ca2+ channel | Spodoptera litura | Jasmonic acid | Arabidopsis thaliana

1 AGRICULTURE NIPGR Shows How Plants Relay an Insect Attack Alarm

PRELIMS PRACTICE MCQ

Consider the following statements about the recent study by NIPGR on plant defence:

1. CNGC13 is a calcium channel that helps relay a wound signal.
2. The signal remains confined to the damaged leaf only.
3. Jasmonic acid based defence is activated in distant leaves after the signal.

Which of the statements given above is/are correct?

a) 1 only

b) 1 and 3 only

c) 2 and 3 only

d) 1, 2 and 3

ANSWER: (b)

SOLUTION EXPLAINED

THROUGH LOGICAL ANALYSIS

The study is about systemic signalling, which means the alarm reaches leaves beyond the damaged one. That rules out statement 2, and any option containing it. Between the rest, statement 1 is clearly true as the channel is named a calcium channel.

THROUGH FACTUAL KNOWLEDGE

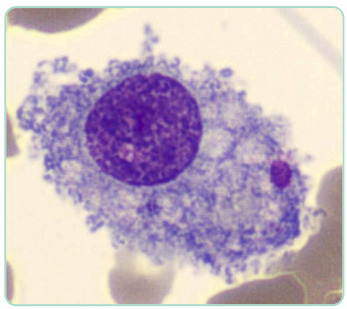
CNGC13 (cyclic nucleotide gated channel 13) is a calcium permeable channel in vascular tissue. It relays the wound calcium signal to distant leaves, where jasmonic acid defence is activated. The model plant was Arabidopsis thaliana and the pest was Spodoptera litura.

HEALTH

2

Macrophages: Stem-Cell Model Shows a Shared Yolk Sac Origin

NEWS IN BRIEF



- A study in Developmental Cell (October 2026) used human pluripotent stem cells to recreate the early yolk sac stage that gives rise to tissue-resident macrophages.
- The teams at VIB-UAntwerp and VIB-KU Leuven showed these precursors become microglia and border-associated macrophages in the brain, and the macrophages of the liver, heart and kidney.
- The model lets researchers study how the local tissue environment shapes macrophage identity, and supports replacing diseased macrophages in future therapies.
- An earlier UCLA study (Journal of Experimental Medicine, February 2026) found that human macrophages keep their memory of interferon gamma only while interferon gamma signalling continues.
- Macrophages are first responders to infection and tissue damage, so misprogrammed ones feed autoimmune diseases such as lupus and arthritis.

KEY CONCEPTS EXPLAINED

Phagocytosis
Engulfing and digesting microbes, debris and dying cells. Macrophages and neutrophils are the main professional phagocytes.

Tissue-resident macrophages
Long-lived macrophages seeded in organs, such as microglia in the brain, Kupffer cells in the liver and alveolar macrophages in the lung.

Innate immune memory
Stronger response of innate cells after a first exposure. The UCLA work showed it depends on ongoing cytokine signals.

UNIQUE FACT

Ilya Metchnikoff discovered phagocytosis and shared the 1908 Nobel Prize in Physiology or Medicine with Paul Ehrlich.

EXAM TRAP

Macrophages are part of innate immunity and do not make antibodies. Antibodies come from plasma cells derived from B lymphocytes. Monocytes circulate in blood, while macrophages sit in tissues.

PRELIMS MEMORY BANK

Innate immunity | Monocyte to macrophage | Kupffer = liver | Microglia = brain | Alveolar = lung | Metchnikoff 1908 | Interferon gamma

2 HEALTH Macrophages: Stem-Cell Model Shows a Shared Yolk Sac Origin

PRELIMS PRACTICE MCQ

Consider the following pairs:

1. Kupffer cells : Liver
2. Microglia : Brain
3. Alveolar macrophages : Spleen

How many of the above pairs are correctly matched?

a. Only one pair

b. Only two pairs

c. All three pairs

d. None of the pairs

ANSWER: (b)

SOLUTION EXPLAINED

THROUGH LOGICAL ANALYSIS

The word alveolar refers to the air sacs of the lung, so a macrophage called alveolar cannot be a spleen cell. That pair is wrong. The other two names are standard organ specific macrophages, so exactly two pairs fit.

THROUGH FACTUAL KNOWLEDGE

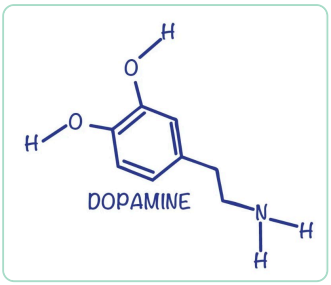
Kupffer cells line the liver sinusoids. Microglia are the resident macrophages of the brain and spinal cord. Alveolar macrophages patrol the lung air sacs. All are tissue-resident macrophages of the innate immune system.

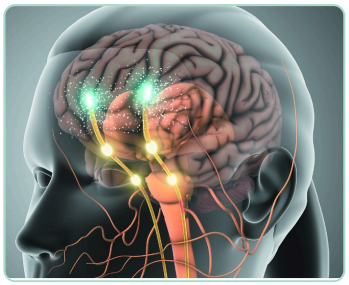
HEALTH

3

Dopamine: Overtraining Alters Its Regulation in the Hippocampus

NEWS IN BRIEF





- A study in the journal Neuroscience, reported on 30 October 2026 (FAPESP, Brazil), found that exhaustive training without enough rest alters dopamine regulation in the mouse hippocampus.
- The hippocampus is the brain region closely linked to memory and the regulation of emotions.
- Researchers simulated overtraining in mice and measured dopamine, serotonin and proteins involved in making them, including tyrosine hydroxylase (TyrH) and VMAT2.
- Dopamine and TyrH stayed raised for 48 hours after the performance test during the rest phase.
- The authors stress dopamine is not a biological villain, because it is essential for pleasure and for staying awake at the right times.

KEY CONCEPTS EXPLAINED

Dopamine
Catecholamine neurotransmitter made from the amino acid tyrosine. It acts in movement, motivation, reward and learning.

Tyrosine hydroxylase (TyrH)
Enzyme that converts tyrosine to L-DOPA, the rate-limiting step of dopamine synthesis.

VMAT2
Vesicular monoamine transporter 2 packs dopamine and other monoamines into vesicles before release.

UNIQUE FACT

Arvid Carlsson showed dopamine is a neurotransmitter in its own right and shared the 2000 Nobel Prize in Physiology or Medicine. L-DOPA is used to treat Parkinson's disease.

EXAM TRAP

Dopamine is not only a pleasure chemical. It also drives movement and learning, and loss of dopamine neurons in the substantia nigra causes Parkinson's disease.

PRELIMS MEMORY BANK

Neurotransmitter | Tyrosine to L-DOPA to dopamine | TyrH = rate-limiting | Substantia nigra | Parkinson's disease | Hippocampus = memory | Carlsson, Nobel 2000

3 HEALTH Dopamine: Overtraining Alters Its Regulation in the Hippocampus

PRELIMS PRACTICE MCQ

Read the two statements and answer the question that follows.

STATEMENT I Loss of dopamine producing neurons in the substantia nigra leads to movement disorders in Parkinson's disease.

STATEMENT II Dopamine helps regulate voluntary movement through circuits of the basal ganglia.

Which one of the following is correct in respect of the above statements?

a **Both Statement I and Statement II are correct and Statement II explains Statement I**

b Both Statement I and Statement II are correct but Statement II does not explain Statement I

c Statement I is correct but Statement II is not correct

d Statement I is not correct but Statement II is correct

ANSWER: (a)

SOLUTION EXPLAINED

THROUGH LOGICAL ANALYSIS

Statement II gives the role of dopamine in movement circuits. If this supply is lost in the substantia nigra, movement control must fail, which is exactly Statement I. So II explains I.

THROUGH FACTUAL KNOWLEDGE

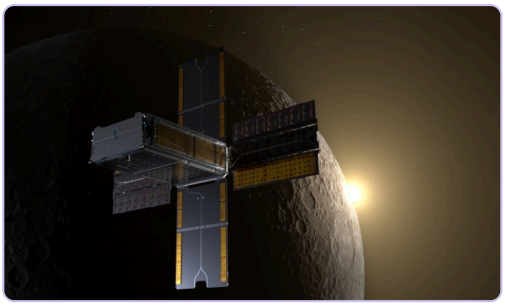
Parkinson's disease follows degeneration of dopamine neurons of the substantia nigra that project to the striatum of the basal ganglia. This is why L-DOPA, the dopamine precursor, is a standard treatment.

SPACE

4

BioSentinel: Yeast CubeSat Studying Deep Space Radiation

NEWS IN BRIEF



- NASA's BioSentinel, a 6U CubeSat of about 10 × 20 × 30 cm built at Ames Research Center, was launched on Artemis I on 16 November 2022 and flew past the Moon into a Sun-centred orbit.
- It was the first biological experiment beyond low Earth orbit since Apollo 17 in 1972.
- It carried two strains of budding yeast, one normal and one poor at repairing DNA, to compare damage from radiation that breaks both DNA strands.
- Four two-week experiments between December 2022 and April 2023 showed no yeast growth. NASA ruled out radiation and said the yeast most likely expired during long storage before launch.
- The onboard radiation detector still works, the mission has been extended, and the craft was over 48 million miles from Earth by November 2025.

KEY CONCEPTS EXPLAINED

CubeSat
Small standard satellite built from 10 cm cubic units (1U). BioSentinel is a 6U craft.

Heliocentric orbit
Orbit around the Sun rather than Earth, chosen to expose the cells to deep space radiation.

Double-strand break
Both strands of the DNA helix are cut. High-energy radiation causes it, and repair-deficient yeast shows how severe the damage is.

UNIQUE FACT

BioSentinel's detector measures both the linear energy transfer and the total ionizing dose of the radiation that hits the spacecraft.

EXAM TRAP

Do not say radiation killed the yeast. NASA ruled radiation out and pointed to yeast expiring in storage. The yeast is Saccharomyces cerevisiae, the species used for bread and beer.

PRELIMS MEMORY BANK

NASA Ames | Artemis I | 6U CubeSat | Heliocentric orbit | Saccharomyces cerevisiae | First since Apollo 17 | Repair-deficient strain

4 SPACE BioSentinel: Yeast CubeSat Studying Deep Space Radiation

PRELIMS PRACTICE MCQ

According to NASA, which one of the following best explains the absence of yeast growth in the BioSentinel deep space experiments?

(a) Intense solar radiation killed the yeast cells

(b) Failure of the lunar flyby manoeuvre

(c) **The yeast most likely expired during long storage before launch**

(d) Loss of contact with the Deep Space Network

ANSWER: (c)

SOLUTION EXPLAINED

THROUGH LOGICAL ANALYSIS

Radiation was the variable being studied, and NASA says it was not the cause. The craft kept sending data to Earth and its detector kept working, so a flyby or a contact failure cannot explain it. Only a pre-launch cause is left.

THROUGH FACTUAL KNOWLEDGE

NASA found no yeast growth in four two-week experiments (Dec 2022 to Apr 2023) and concluded the yeast likely expired after extended storage ahead of launch. The radiation detector continues to collect data in deep space.

DEFENCE

5

Exercise Garuda Shakti 2026: India and Indonesia Special Forces

NEWS IN BRIEF



- The 11th edition of Exercise Garuda Shakti began at Banyuwangi, East Java, Indonesia on 27 October 2026 and runs to 6 November 2026.
- It is a bilateral special forces exercise. The Indian contingent is from the Parachute Regiment (Special Forces).
- The focus is jungle warfare and special operations, with obstacle crossing, combat marksmanship and a validation exercise to test endurance and combat readiness.
- The 10th edition was held at the Special Forces Training School, Bakloh, Himachal Pradesh, from 3 to 12 December 2025.
- The exercise is hosted alternately by the two countries. Samudra Shakti is the India-Indonesia naval exercise.

KEY CONCEPTS EXPLAINED

Bilateral exercise
Joint drill between two armed forces to build trust and share tactics, techniques and procedures.

Special forces
Small, highly trained units for special operations. The Parachute Regiment (Special Forces) is the Army's special forces arm.

Interoperability
Ability of two forces to plan, communicate and operate together in the same mission.

UNIQUE FACT

Garuda is the mythical bird that appears on Indonesia's national emblem. Garuda Shakti is the army special forces exercise, while Samudra Shakti is the naval one.

EXAM TRAP

The 2026 edition is the 11th and is held in Indonesia. The Himachal Pradesh edition was the 10th, held in 2025. Do not confuse the exercise with Samudra Shakti.

PRELIMS MEMORY BANK

India-Indonesia | Banyuwangi, East Java | 27 Oct to 6 Nov 2026 | 11th edition | Parachute Regiment (SF) | Jungle warfare | Samudra Shakti = naval

5 DEFENCE Exercise Garuda Shakti 2026: India and Indonesia Special Forces

PRELIMS PRACTICE MCQ

Consider the following statements about Exercise Garuda Shakti:

STATEMENT I It is a bilateral special forces exercise between India and Indonesia.

STATEMENT II The 2026 edition is being held at Bakloh in Himachal Pradesh.

STATEMENT III The 2026 edition focuses on jungle warfare and special operations.

Which one of the following is correct?

(a) Only I and II

(b) Only I and III

(c) Only II and III

(d) I, II and III

ANSWER: (b)

SOLUTION EXPLAINED

THROUGH LOGICAL ANALYSIS

The word Garuda points to Indonesia, so a venue in Himachal Pradesh is likely the earlier edition hosted in India. That removes statement II and every option with it. The two remaining statements fit together.

THROUGH FACTUAL KNOWLEDGE

The 11th edition began at Banyuwangi, Indonesia on 27 October 2026. The 10th edition was at Bakloh, Himachal Pradesh in December 2025. The Indian Army sends the Parachute Regiment (Special Forces) and the focus is jungle warfare.

DEFENCE

6

IN-RoKN 2026: Indian and South Korean Navies Exercise at Busan

NEWS IN BRIEF



- INS Sahyadri arrived at Busan Naval Harbour, South Korea, on 26 October 2026 for the India-Republic of Korea Navy (IN-RoKN) bilateral exercise.
- This is the second edition. The first was held in October 2025 at Busan and also involved INS Sahyadri.
- The exercise has a harbour phase and a sea phase. In 2025 the sea phase was with ROKS Gyeongnam, a Daegu-class frigate.
- INS Sahyadri is an indigenously built Shivalik-class guided missile stealth frigate under Project 17.
- The exercise supports India's Act East policy and maritime cooperation in the Indo-Pacific.

KEY CONCEPTS EXPLAINED

Harbour phase
Port-based part of an exercise with cross-deck visits, professional exchanges and sharing of best practices.

Sea phase
At-sea drills and manoeuvres between ships to build interoperability.

Shivalik class (Project 17)
First Indian stealth frigates: INS Shivalik (2010), Satpura (2011) and Sahyadri.

UNIQUE FACT

INS Sahyadri is the third and last ship of Project 17, which completed that class of stealth frigates.

EXAM TRAP

Do not call 2026 the first edition, as the inaugural IN-RoKN was in 2025. Sahyadri is a Shivalik-class frigate, not a destroyer and not a Nilgiri-class ship.

PRELIMS MEMORY BANK

India-ROK Navy | Busan | 2nd edition | INS Sahyadri | Shivalik class | Act East | First edition: Oct 2025

6 DEFENCE IN-RoKN 2026: Indian and South Korean Navies Exercise at Busan

PRELIMS PRACTICE MCQ

With reference to the IN-RoKN bilateral naval exercise, which one of the following is correct?

a. Its inaugural edition was held in 2026

b. INS Sahyadri took part in both the 2025 and 2026 editions

c. INS Sahyadri is a Nilgiri-class frigate

d. The 2026 edition is hosted at Visakhapatnam

ANSWER: (b)

SOLUTION EXPLAINED

THROUGH LOGICAL ANALYSIS

RoKN stands for Republic of Korea Navy, so a Korean port is a likelier venue than an Indian one, which removes option d. The 2026 edition being the second removes option a, and the class mismatch removes option c.

THROUGH FACTUAL KNOWLEDGE

The first IN-RoKN edition was held at Busan in October 2025, and INS Sahyadri arrived at Busan again on 26 October 2026 for the second edition. Sahyadri belongs to the Shivalik class under Project 17.

DEFENCE

7

INS Srishti: Fourth Goa-Built NGOPV Launched

NEWS IN BRIEF



- Goa Shipyard Limited (GSL) launched INS Srishti (Yard 1283) at its Vaddem facility in Goa on 27 October 2026.
- It is the fourth Next Generation Offshore Patrol Vessel (NGOPV) launched by GSL for the Indian Navy.
- The NGOPV programme covers 11 vessels ordered through contracts signed on 30 March 2023.
- Srishti is a Sanskrit word meaning creation. Yard 1283 is the shipyard construction number.
- The role is maritime surveillance, patrol and protection of offshore assets and national interests at sea.

KEY CONCEPTS EXPLAINED

Offshore patrol vessel (OPV)

Mid-size warship for surveillance, patrol of the exclusive economic zone, anti-piracy and escort tasks.

Launch and commissioning

Launch is when the hull is floated out. Commissioning is the formal induction into service after fitting out and trials.

Yard number

Serial number a shipyard gives to a vessel under construction.

UNIQUE FACT

The Navy aims to grow to 200 warships and submarines by 2035, and domestic yards such as GSL build most of the new platforms.

EXAM TRAP

INS Srishti has only been launched and is not yet commissioned. It is the fourth NGOPV launched by GSL, not the first.

PRELIMS MEMORY BANK

GSL, Goa | Yard 1283 | NGOPV | 11 vessels | Contract: 30 Mar 2023 | Launched 27 Oct 2026 | Srishti = creation

7 DEFENCE INS Srishti: Fourth Goa-Built NGOPV Launched

PRELIMS PRACTICE MCQ

Consider the following statements about INS Srishti:

1. It is a Next Generation Offshore Patrol Vessel built by Goa Shipyard Limited.
2. It is the first NGOPV launched under the programme.
3. It was formally commissioned into the Indian Navy on 27 October 2026.

How many of the statements given above are correct?

- **(a) Only one**
- (b) Only two
- (c) All three
- (d) None

ANSWER: (a)

SOLUTION EXPLAINED

THROUGH LOGICAL ANALYSIS

The news event was a launch, and launch normally precedes commissioning by a long period of fitting and sea trials. That makes statement 3 doubtful. With 11 ships ordered, being the first is unlikely for a ship in the news now.

THROUGH FACTUAL KNOWLEDGE

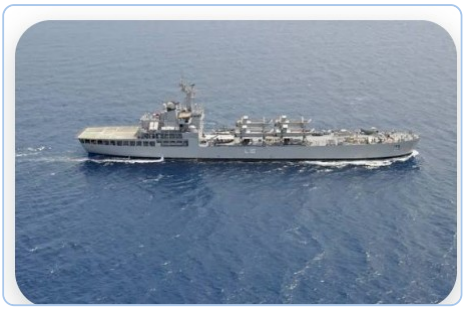
GSL launched INS Srishti (Yard 1283) on 27 October 2026. It is the fourth NGOPV launched by GSL, out of 11 ordered in March 2023. It has not been commissioned yet.

DEFENCE

8

INS Kesari: Water Ingress Reported at Visakhapatnam Dockyard

NEWS IN BRIEF



- Water ingress was reported on 31 October 2026 in a compartment of INS Kesari below the waterline while she was berthed at the Naval Dockyard, Visakhapatnam. No casualties were reported.
- INS Kesari (L15) is a Shardul-class tank landing ship (LST) built by Garden Reach Shipbuilders and Engineers (GRSE), Kolkata, and commissioned on 5 April 2008.
- Landing ships carry troops, vehicles and tanks and support humanitarian assistance and disaster relief.
- Under Mission Sagar, Kesari carried aid and a medical team to Mauritius. In January 2022 she carried two fast interceptor boats to Mozambique.
- Kesari is the second ship of the Shardul class, an upgrade of the Magar class.

KEY CONCEPTS EXPLAINED

Tank landing ship (LST)
Amphibious ship that lands tanks, vehicles and troops directly on a shore.

Water ingress
Unplanned entry of water into hull compartments. Watertight doors, bulkheads and dewatering pumps limit the damage.

HADR
Humanitarian assistance and disaster relief, a standard secondary role of amphibious ships.

UNIQUE FACT

The Shardul class has three ships: Shardul, Kesari and Airavat. An earlier INS Kesari (1975) was a Polish-built Kumbhir-class LST decommissioned in 1999.

EXAM TRAP

Kesari is a landing ship, not a destroyer or a submarine. Do not confuse it with the Project 15A Kolkata-class destroyers, such as INS Chennai.

PRELIMS MEMORY BANK

LST, pennant L15 | Shardul class | GRSE Kolkata | Commissioned 5 Apr 2008 | Incident 31 Oct 2026 | Mission Sagar | HADR

8 DEFENCE INS Kesari: Water Ingress Reported at Visakhapatnam Dockyard

PRELIMS PRACTICE MCQ

Consider the following statements about INS Kesari:

1. It was built by Garden Reach Shipbuilders and Engineers, Kolkata.
2. It is a Shardul-class tank landing ship.
3. It was commissioned in 2008.
4. It belongs to the Project 15A Kolkata-class destroyers.

Which of the statements given above are correct?

a. 1 and 2 only

b. 1, 2 and 3 only

c. 2, 3 and 4 only

d. 1 and 4 only

ANSWER: (b)

SOLUTION EXPLAINED

THROUGH LOGICAL ANALYSIS

A tank landing ship cannot also be a stealth destroyer, so statements 2 and 4 cannot both be true. Statement 2 is the one in line with its role, which removes options c and d. The 2008 commissioning then decides between a and b.

THROUGH FACTUAL KNOWLEDGE

INS Kesari (L15) is a GRSE built Shardul-class LST, commissioned on 5 April 2008. Project 15A is the Kolkata-class destroyer project and has no link with it.

DEFENCE

9

AIM-120 AMRAAM: US and Japan Agree on Final Assembly in Japan

NEWS IN BRIEF



- On 28 October 2026, Japan's Defence Minister Shinjiro Koizumi said the US and Japan agreed to set up a final assembly and inspection facility in Japan for the AIM-120 AMRAAM, after talks on the sidelines of the ASEAN Defence Ministers' Meeting Plus in the Philippines.
- The facility will not build the whole missile locally, as its guidance technology is classified.
- The deal is part of Operation Supercharge, along with sharing technical information to raise output of the SM-3 Block IIA interceptor.
- On 25 September 2026 the Pentagon had awarded Raytheon (RTX) a multiyear contract worth up to $20.7 billion over five years plus two option years, to nearly double AMRAAM output.
- AMRAAM entered service in 1991 and replaced the AIM-7 Sparrow. The AIM-260 JATM is being developed to outrange and eventually replace it.

KEY CONCEPTS EXPLAINED

Beyond-visual-range (BVR) missile
Air-to-air missile fired at targets too far to see, guided by radar data from the launching jet.

Active radar homing
The missile carries its own radar seeker for the final approach, so the pilot can turn away after launch.

Final assembly and checkout
Last stage where major sections are joined and tested. Sensitive guidance parts stay under tight protection.

UNIQUE FACT

AMRAAM scored its first combat kill in December 1992, when a US Air Force F-16 shot down an Iraqi MiG-25.

EXAM TRAP

AMRAAM is a medium-range radar guided air-to-air missile. ASRAAM is a short-range infrared guided one. AMRAAM is not a surface-to-air missile.

PRELIMS MEMORY BANK

AIM-120 | Raytheon (RTX) | In service 1991 | Replaced AIM-7 Sparrow | BVR, active radar | AIM-260 JATM next | Up to $20.7 bn deal

9 DEFENCE AIM-120 AMRAAM: US and Japan Agree on Final Assembly in Japan

PRELIMS PRACTICE MCQ

Consider the following statements about the AIM-120 AMRAAM:

1. It is an active radar homing beyond-visual-range air-to-air missile.
2. It entered service as a replacement for the AIM-7 Sparrow.
3. The AIM-260 JATM is being developed to eventually replace it.
4. It is a short-range infrared guided missile.

Which of the statements given above are correct?

a. 1 and 4 only

b. 2 and 3 only

c. 1, 2 and 3 only

d. 1, 3 and 4 only

ANSWER: (c)

SOLUTION EXPLAINED

THROUGH LOGICAL ANALYSIS

The A in AMRAAM stands for advanced and the M for medium-range, so a short-range infrared description in statement 4 contradicts the name. That removes options a and d. Statement 1 matches the name, which removes b.

THROUGH FACTUAL KNOWLEDGE

AMRAAM is Raytheon's active radar guided medium-range air-to-air missile, in service since 1991 as the AIM-7 Sparrow replacement. The AIM-260 JATM is its planned longer-range successor.

DEFENCE

10

Project 18A: In-Principle Approval for Next Generation Destroyers

NEWS IN BRIEF





- On 26 October 2026 the Defence Acquisition Council (DAC), chaired by the Defence Minister, gave in-principle approval (Acceptance of Necessity) for the Navy's Project 18A Next Generation Destroyers at over Rs 75,000 crore.
- The same meeting cleared capital acquisitions worth about Rs 2.12 lakh crore, with about 82% to be sourced from Indian industry.
- The ships are designed by the Navy's Warship Design Bureau and are planned to be larger and more capable than the Visakhapatnam class (Project 15B).
- Reports say an initial batch of four to six ships is under consideration, alongside Project 15C destroyers and Project 17B frigates.
- Project 18A is still at an early stage, with construction years away.

KEY CONCEPTS EXPLAINED

Acceptance of Necessity (AoN)
First formal DAC clearance that a purchase is needed. It comes before tendering, evaluation and contract signing.

Defence Acquisition Council (DAC)
Apex Ministry of Defence body for capital acquisition decisions, set up in 2001 after the Kargil conflict.

Warship Design Bureau (WDB)
The Navy's in-house organisation that designs indigenous warships.

UNIQUE FACT

The Visakhapatnam class (Project 15B) has four stealth destroyers: Visakhapatnam, Mormugao, Imphal and Surat.

EXAM TRAP

AoN is only in-principle approval, not a contract or money spent. Project 18A is for destroyers, while Project 17B is for frigates.

PRELIMS MEMORY BANK

DAC | AoN | Over Rs 75,000 cr | 26 Oct 2026 | Warship Design Bureau | Project 15B = Visakhapatnam class | Project 17B = frigates

10 DEFENCE Project 18A: In-Principle Approval for Next Generation Destroyers

PRELIMS PRACTICE MCQ

Project 18A, recently approved in principle by the Defence Acquisition Council, refers to which one of the following?

- **a** Next Generation Destroyers designed by the Navy's Warship Design Bureau
- **b** Stealth frigates to follow the Nilgiri class
- **c** A nuclear powered attack submarine programme
- **d** Offshore patrol vessels being built by Goa Shipyard Limited

ANSWER: (a)

SOLUTION EXPLAINED

THROUGH LOGICAL ANALYSIS

The approval was for a destroyer project, so the frigate, submarine and patrol vessel options do not fit. The frigates that follow the Nilgiri class fall under a different project number.

THROUGH FACTUAL KNOWLEDGE

Project 18A covers Next Generation Destroyers designed by the Warship Design Bureau, cleared in principle on 26 October 2026 at over Rs 75,000 crore. Project 17B covers the follow-on frigates and NGOPVs are a separate programme.

S&T POLICY

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ESTIC 2026: Emerging Science, Technology and Innovation Conclave

NEWS IN BRIEF



- The second Emerging Science, Technology and Innovation Conclave (ESTIC 2026) was held from 27 to 29 October 2026 at Bharat Mandapam, New Delhi. The Prime Minister inaugurated it on 27 October.
- The theme was Creative Minds, Catalyzing Science, Empowering Technologies, across 12 thematic areas including AI, biotechnology, advanced materials, semiconductors, quantum, space and agri-tech.
- The first ESTIC was held on 3 and 4 November 2025. The conclave has replaced the Indian Science Congress.
- It brought together 13 ministries, laboratories, startups, investors and academia, with over 5,000 delegates on day one.
- A Rs 1 lakh crore commitment for Research, Development and Innovation was highlighted, and startups were cited as growing from about 400 in 2014 to over 2.3 lakh.

KEY CONCEPTS EXPLAINED

Research, Development and Innovation (RDI)

Funding commitment to back research and its commercialisation. The Anusandhan National Research Foundation (ANRF) supports research capacity.

Deep-tech startup

Venture built on advanced science or engineering, such as AI, quantum or semiconductors, needing longer R&D time and patient funding.

Technology transfer

Moving laboratory research into products through licensing, industry partnership or startups.

UNIQUE FACT

The Indian Science Congress began in 1914 in Kolkata, then Calcutta, and was the country's main annual science gathering for over a century.

EXAM TRAP

ESTIC is organised by the Department of Science and Technology with other science ministries. The 2026 edition is the second, not the first, and it has replaced the Indian Science Congress.

PRELIMS MEMORY BANK

ESTIC | 27 to 29 Oct 2026 | Bharat Mandapam | 2nd edition | DST | 12 thematic areas | Replaced Indian Science Congress | Rs 1 lakh cr RDI

11 S&T POLICY **ESTIC 2026: Emerging Science, Technology and Innovation Conclave**

PRELIMS PRACTICE MCQ

Consider the following statements about ESTIC 2026:

1. It is organised by the Department of Science and Technology with other science ministries.
2. It has replaced the Indian Science Congress as the flagship science gathering.
3. The 2026 edition is the first edition of ESTIC.
4. The 2026 edition was held at Bharat Mandapam, New Delhi.

How many of the statements given above are correct?

a. Only one

b. Only two

c. Only three

d. All four

ANSWER: (c)

SOLUTION EXPLAINED

THROUGH LOGICAL ANALYSIS

The first conclave was held in November 2025 and the 2026 event is a year later, so statement 3 fails. The remaining three describe the organiser, the successor role and the venue, and they are consistent with each other.

THROUGH FACTUAL KNOWLEDGE

ESTIC 2026 was the second edition, held 27 to 29 October 2026 at Bharat Mandapam. The first was on 3 and 4 November 2025. The DST organises it and it has taken the place of the Indian Science Congress.