NASA's 3-D printable tools could test blood samples on ISS

What in news:

- ✓ The new NASA project, called Omics in Space, aims to develop technology used to study 'omics' – fields of microbiology that are important to human health

About news:

- ✓ To enable astronauts aboard the International Space Station (ISS) to analyse biological samples without sending them back to Earth
- ✓ NASA researchers, including one of Indian-origin, are developing 3-D printable tools that could handle liquids like blood samples without spilling in microgravity.
- ✓ Learning how bacteria affect crew health, or how genes affect aging and disease, can ensure the safety of long-term missions to Mars and beyond.
- ✓ The new NASA project, called Omics in Space, aims to develop technology used to study 'omics' – fields of microbiology that are important to human health.
- ✓ Omics includes research into genomes, microbiomes and proteomes.
- ✓ NASA has already studied omics with efforts like the Microbial Tracking 1 experiment, which examined microbial diversity on the space station.
- ✓ But there is no way to process samples on the station right now, so they have to be sent down to Earth.
- ✓ This project will develop an automated system for studying molecular biology with minimal crew intervention.

Challenges:

- ✓ One of the biggest challenges with preparing samples is handling fluids in microgravity. Astronauts collect a variety of samples, including their own saliva and blood, as well as microbes swabbed from the walls of the ISS.
- ✓ These samples have to then be mixed with water so they can be injected into instruments for analysis. Without the proper tools, samples can spill, float or form air bubbles that could compromise results.

Expected prelims question:

Consider the following statements:

1. NASA project, called Omics in Space, aims to develop technology used to study 'omics' – fields of microbiology that are important to human health
2. One of the biggest challenges with preparing samples is handling fluids in microgravity

Which of above statements are/is correct?

a) Only 1

b) Only 2
c) Both 1 and 2
d) None of above

Ans – c

Expected mains question

The new NASA project, called Omics in Space, aims to develop technology used to study 'omics' – fields of microbiology that are important to human health, analyse its advantages and the challenges faced by the project.

Progress MS-08: Unmanned Russian Cargo Ship launched to Space Station

What in news:

- A Russian Soyuz rocket launched an unpiloted cargo ship toward the International Space Station today (Feb. 13), kicking off a two-day delivery mission to the orbiting laboratory.

About news:

- The Soyuz 2.1a rocket and the cargo ship Progress 69 from the Baikonur Cosmodrome in Kazakhstan, carrying about 3 tons of supplies for space station astronauts. The successful launch came two days after an unspecified problem triggered an abort in the final minute of an earlier launch try Sunday
- The Progress 69 cargo ship is now on track to arrive at the International Space Station early Thursday. The spacecraft is scheduled to dock at the aft end of the station's Russian-built Zvezda Service Module
- Russia's Roscosmos space agency initially tried to launch Progress 69 on Sunday and attempt a new superfast flight plan that would send the cargo ship to the space station in just 3.5 hours.
- In recent years, Russia's Progress vehicles and Soyuz crew capsules have typically taken about 6 hours to reach the space station due to the orbital mechanics of those flights.
- Earlier in the station's history, Soyuz and Progress flights regularly took two days. That two-day flight profile is the one Progress 69 is following for its mission.
- Progress 69 is packed with food, science gear and other vital supplies for the six-person Expedition 54 crew on the International Space Station. That cargo includes 3,128 lbs. (1,418 kilograms) of spare parts and other supplies; 1,940 lbs. (880 kg) of propellant; 53 lbs. (24 kg) of air; and 48 lbs. (21 kg) of oxygen.

Roscosmos space agency

- The Roscosmos State Corporation for Space Activities commonly known as Roscosmos (Russian: Роскосмос), is the governmental body responsible for the space science program of the Russian Federation and general aerospace research.

Expected prelims question

Roscosmos space agency belongs to

a) Russia
b) Kazakhstan
c) India
d) America

Ans - a

Expected mains question

Recently Russian Soyuz rocket launched an unpiloted cargo ship toward the International Space Station, Discuss how its benefits to crew of ISS and experiments conducted by astronauts