

## UNIT –IV

### SPACE TREK

1) Where is the Hubble telescope placed?

A) The Hubble telescope is placed in space.

2) How do the astronomers communicate with the telescope?

A) The astronomers communicate with the telescope through antenna.

3) How is the Hubble able to operate without power from the sun?

A) Hubble needs electricity to operate. Hubble can able to operate without the power from the sun because it has solar cell 'blanket'.

4) What are the conditions under which the Hubble has to operate?

A) The conditions are the Hubble would be subject to the rigors of zero gravity and temperature extremes – fluctuations of more than 100 degrees Fahrenheit.

5) How is the telescope protected in these conditions?

A) The telescope was given a 'skin' or blanket of multilayered insulation which protects it from temperature extremes and also another layer. New Outer Blanket Layers (NOBLs) are also used to protect the telescope.

6) How are the optical system and science instruments protected?

A) Optical system and science instruments are protected by a truss that is made of graphite epoxy. Graphite epoxy is a stiff, strong and lightweight material that resists expanding and contracting in extremes of temperature.

Hubble has additional requirements like several spacecraft support systems. Identify them and write their functions in the columns provided.

Support System	Functions/ job description
1. The Support Systems Module (SSM)	Provides electrical power, data communications and pointing control and managing.
2. The Optical Telescope Assembly (OTA)	It collects and concentrates the incoming light in the focal plane for use by the science instruments.
3. Eight major science instruments – 4 Focal Plane Structure(FPS)	Four housed in an AFT section
4. Fine Guidance Sensors	It is place along the circumference of the space craft
5. Two Solar Arrays (SA)	Generate electrical power and charge on board

Verbal Ability:

Provide the appropriate word using correct prefix for the meanings given

- a) Telephone banking Phone banking
- b) Technology of sending signals, images and messages over long distances Telecommunications
- c) Conference or discussion conducted through video linking Video conference
- d) The practice of working from home Entrepreneur
- e) Study of speech sounds of a language phonetics
- f) Giving news mainly using photographs photojournalism
- g) Instrument that records earthquakes Seismograph
- h) A detailed written study of a single subject Monograph
- i) A method of producing images Photography

Fill in the blanks with the appropriate word from the list.

Accessible, antenna, communicate, installation, transmission, connect, metallic, current, parallel, symmetrical

- a) Wire is used to connect two points in a circuit.
- b) The car is painted with metallic paint.
- c) A road runs parallel to the railway line.
- d) People use telephone to communicate with people in other parts of the country.
- e) The crystal is perfectly symmetrical.
- f) Despite the broken antenna the radio in the car picked up signals.
- g) The desert is accessible only by helicopter.
- h) The centre has started the transmission of programmes to the rural students.
- i) He swam to the shore against a strong current.
- j) The installation of the new telephone lines may take a few days.

1) What are 'milestones'? What are the milestones achieved by ISRO?

A) Milestones are tools used in project management to mark specific points along a project timeline. These points may signal anchors such as a project start and end date.

The history of ISRO starts with the experiments phase in 1970 when experimental satellites like Aryabhata, Bhaskara, Rohini and Apple were launched.

2) How is space research useful for agriculture?

A) Work out where to build small dams to capture rain water and recharge underground reservoirs. This approach could help reclaim arid and semi-arid land for agriculture use.

3) What major problem of rural India could be solved by the use of satellite images?

A) Ensuring supply of clean drinking water is a problem in many parts of rural India. Villages often resort to guessing the right spot to drill a well based on experience. Topographic and hydrological maps produced from satellite images help rural communities locate areas most likely to yield underground water.

4) What is the role played by satellites in disaster management?

A) ISRO also played a major role in early warning systems during disasters. Early/prior information (even a few hours before a disaster) can save thousands of lives. With advancement of remote sensing and communication satellites, the death toll reduced and mitigating the adverse affect of deadly cyclones.

5) What is telemedicine and how is it useful to people?

A) The process of introducing the telemedicine facility to the gross roots level population to deliver health care services to the remote, distant and underserved regions of the country. Some 70+ hospitals of remote Andaman islands have already been linked with the hospitals of mainland India, so that advanced medical treatment can be given to patients here.

### Genesis of ISRO

#### Verbal Ability:-

1. A small object orbiting a larger one – Star Orbiting
2. Another name for space craft – Rocket Ship
3. Hurl or send from rockets – Launch
4. Detailed description of a district – territory
5. A Synonym of predicted – Forecast/Foretell/foresee
6. A period of ten years – Decade

7. A source of water supply – reservoir.

Chandrayaan – 2

1) Find out from the internet when Chandrayaan- I was launched.

A) October 22<sup>nd</sup>, 2008.

2) How is Chandrayaan’s finding of the existence of water in the moon significant?

A) Using data collected by India’s Chandrayaan mission, NASA has detected magnetic water locked under the surface of the moon. The findings represent the first remote detection of this form of water that originates from deep within the moon’s interior, on the lunar surface.

Initialisms and acronyms

a) ISRO – Indian Space Research Organization

b) NASA – National Aeronautics and Space Administration

c) ISS – International Space Station

d) ASLV – Augmented Satellite Launch Vehicle

e) GSLV – Geosynchronous Satellite Launch Vehicle

f) PSLV – Polar Satellite Launch Vehicle

g) ISM – International Symposium on micro architecture

h) NTPC – National Thermal Power Corporation

i) ONGC – Oil and Natural Gas Corporation

j) R&D – Research and Development

A Home in the Sky

1) Why is the arrival of new faces a cause of celebration in ISS?

A) ISS means the International Space Station and it refers with more than a decade of construction now coming to an end, astronauts can finally look forward to stretching out and using the space station to the full. The first residents arrived on 2 November 2000 but fewer than 200 people have firsthand knowledge of life on board. The space station has permanent crew of six, so the arrival of new faces is a cause for celebration.

2) What was the experience of a shuttle pilot?

A) On serving shuttle pilot confessed to leaving a wake of laptops and other vital belongings behind him the first time he tried to fly from one room to another. People sit in mid-air, tapping away at a computer with only a toe hooked under a wall strap to anchor themselves. Then with a flick of the hand, they'll float up to another computer and carry on typing there. Getting from one place to another is all the more difficult because up and down have no absolute meaning.

3) What happens when one tries to sleep?

A) Unsurprisingly, falling asleep can take some getting used to. Just as you are nodding off, you can feel as though you've fallen off a ten-storey building. Anyone still awake after bedtime would see his snoring form drift by slowly bouncing off the walls, his course set by the air currents that gently pushed and pulled him.

4) How long does daylight last? What effect does this have on the astronauts?

A) Open the covers over the windows and the light can be so blinding that astronauts reach for their sunglasses. But after 45 minutes of day light, a dark line appears on the planet, dividing earth into night and day. For a couple of seconds, the space station is bathed in coppery light and then complex darkness. Another 45 minutes later, just as abruptly, the sun rises to fill the station with brilliant light again. The onslaught of apparent days and nights would play havoc with astronaut's body docks, so a shutter-down and bedtime schedule is imposed by mission controllers.

Verbal Ability:-

Using Suffix

1. Ravi seems to be very careless; he makes lots of mistakes while taking his exams. His problem appears to be endless because it continues even in college. He is a priceless boy. He avoids company and so remains friendless.

2. The child lost his house and his parents in the Tsunami. No one knows his name. This child is now homeless and nameless. A social service organization came forward to help this helpless child. A family photograph is the only thoughtless possession he has.

Space Tourism

1) What type of vehicles do we need to tour space?

A) In order for people to be able to travel economically to space, for space tourism and for other purposes. We need reusable launch vehicles. Ex: - Space ship one – the only ones of importance are the piloted passenger – carrying (vehicles). Space plane, Space craft, rocket, shuttle

2) What would space hotels actually look like?

A) Hotels in orbit will offer the services you expect from a hotel – private rooms, meals, bars. But they offer two unique experiences including sports and other activities that make use of this and the endless entertainment of living in zero-gravity.

3) What kind of food do you expect to get?

A) We eat food prepared on earth that can be reheated in a microwave space sickness usually involves a dramatic loss of appetite.