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Paper-3 | Part-A

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कौटिल्य एकेडमी

प्रश्न संख्या

मुख्य परीक्षा उत्तर पुस्तिका
(Mains Answer Sheet)

1. B. AYUSH - • component of Ayushman Bharat.
• Ayurveda, Yoga & Naturopathy, Unani, Siddha, Sowa-Rigpa and Homeopathy.
• Six indigenous system of medicine practised in India.

C. GSLV - • Geosynchronous Satellite Launch Vehicle developed to launch heavier INSAT class of satellites in Geosynchronous Transfer orbit.
• It has 3 stage [solid | liquid | cryogenic]

D. TRIMS - Trade Related Investment measures agreement of WTO → for fair treatment of investment in all member countries.
→ various restrictive measures on investments.

E. Cloning - • a process of producing an exact copy of a complete organism or cell by non-sexual methods.
first clone of a mammal was 'dolly' a sheep.
• the copy is physically & genetically similar to parent cell.

F. Vikram Sarabhai — Indian physcist also known as Father of Indian Space Program.
- He was the founder of Indian Space Research Organisation (ISRO).
- Contributed in development of Nuclear Power in India.

H.
Periodicity - In Periodic table, when a property of elements repeats after fixed no. of elements Eg. Lithium (Li) Atomic No. 3 has same property as Sodium (Na) Atomic No. 11.

I. Amplitude - Maximum displacement of a vibrating body from its mean position.

Low High

J. Marasmus -
- form of nutrition deficiency (malnutrition)
- usually occurs in children
- occur due to deficiency of proteins, vitamins.

L. COBOL -
- is a computer programming language.

Osmosis - The passage of water from high concentration to low concentration through a semi-permeable membrane is called as Osmosis. It can take place in Hypertonic, Hypotonic solutions.

K.

RRCAT — Raja Ramanna Centre for Advanced Technology established by Department of Atomic Research, Headquartered in Indore M.P.

N.

- Researches in Laser, non-nuclear projects.

O.

NRSC — National Remote sensing centre, Hyderabad.

- Responsible for data acquisition, processing through remote sensing, early warning of disasters.

2. A.

Indian Regional Navigation Satellite System (IRNSS) developed by the Indian Space Research Organization (ISRO).

Structure → eight satellite + three satellites in Geostationary orbit + five in Geosynchronous orbit.

- It's India's regional navigation system also called NAVIC (Navigation in Indian constellation).

advantages
- → helpful in disaster management.
- → Mapping & geographical data capture.
- → vehicle tracking (managment of mining & transportation)
- → Terrestrial, aerial, marine navigation.
- → integration with mobile phones.

main objective of IRNSS is to provide navigation, reliable position and timing services over India & its neighbourhood.

C.

Nuclear Energy

Energy resulting from changes in the nucleus of atoms is Nuclear energy.

Nuclear energy is released by splitting the atom, using the process called Nuclear fission.

Atoms are Uranium, Thorium, plutonium.

advantages

- used in space missions
- no emission of Greenhouse Gas.
- source of clean energy.
- can be built in rural/urban areas.
- tremendous amount of energy.
- source of employment.
- vast electricity production.
- overall development of economy.

Potential hazards

- risk of accidental leakages of nuclear radiations.
- high risk of environment contamination.
- Health hazards for people working or living near Nuclear plants.

Nuclear energy is essential in terms of security for India as a nation.

2. D

Reusable Launch Vehicle (RLV-TD) launched from Satish Dhawan Space Centre, Sriharikota.

In space mission, RLV is the analog of an aircraft in space. The vehicle can stay in orbit during the mission period and return to Earth after the completion of the mission.

Objective

- to assist National Institute of Ocean Technology (NIOT)
- to assist Coastguard for wind measurement
- reduce high cost.

ISRO handles the RLV-TD programme. Technology consist of Hypersonic Rocket + reusable launch vehicle + air-breathing engines.

Significance

- RLV - technological demonstrator known as Hypersonic flight experiment
- reliable, low cost.
- reusable technology.

Scientist believes that they could reduce the cost as much as 10 times by his reusable technology

2. a.

Environment Degradation

↓

Reduction in quality & quantity of natural resources. may be due to biological processes, human activities to such great extent that it cannot be restored easily.

1) Natural Factors

Terrestrial natural hazards
- volcanic eruptions
- Earthquakes etc.

atmospheric natural hazards
- cyclones
- forest fires etc.

cumulative
- Floods, drought.

Human Factors → chemical & nuclear
- outburst of gases, chemicals from industries
- Leakages / blasts.

physically induced
- deliberate forest fires
- Landslides due to mining
- deforestation.

Biological hazards
- epidemics.
- eg. Locust attack.

Modifications of Land Forms, Hydrological process have led to vast degradation of environment pouring its component air, water, land etc.

2. 4.

Sustainable Development simply means "development which meets the needs of the present without compromising the ability of future generations to meet their own needs".

Needs → Scarcity of resources
- water scarcity by 2025
- degraded land therefore no food.

Needs → Climate change
- rising sea level
- increase in temperature & extreme weather conditions.

Needs → Overexploitation of Natural Resources
- decline of marine life, fossil fuels, polluted air, water.

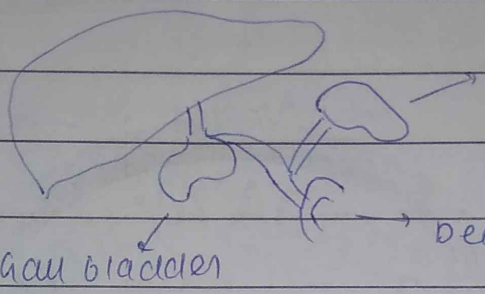
Purpose → "There's enough for everybody's need, not for anybody's greed".

- environment sustainability - to prevent nature, water, sustainable construction.
- economic sustainability - equal distribution of resources for all whether rich or poor.
- without harming the environment, optimum utilization of resources.

Kyoto Protocol, Earth summit are some measures to combat all these problems.

2. I

Liver is the largest Gland of human body. It weighs about 1.5 - 2kg in adults. Cells of liver are called Hepatocytes.



Location - located in upper right portion of abdomen.

Importance - • It's only organ that has ability to regenerate.

• Production of Bile - which helps in digestion and absorbtion of fats, vitamins.

• Supports Blood clots - Bile absorbs vitamin K, if bile is not produced, no Clotting.

• Stores vitamins, minerals - vitamin A, D, E, K, B12 are stored in liver.

• Filtering Blood - hormones, alcohols are filtered by liver from blood.

• Regulates blood glucose level.

Apart from all these it helps in destroying disease causing agents through Kupffer cells.

2. J.

Any substance which is made up of same kind of molecules is called as element and here elements on their properties can be metal or non-metal.

Difference between metal and non-metal are —

• **Physical state** - metals are generally solid at room temperature and non-metals exist in solid, liquid, gas.

• **Malleability** - material to be beaten in sheets.
metals can be converted into sheets but non-metal cannot as they break easily.

• **Hardness** - metals are hard except Na and K and non-metals are soft except diamond.

• **Lustre** -
shine in metals is called Lustre. Non-metals do not have lustre.

• **conductivity** - metals allows heat & electricity to pass through them but non-metals except graphite are bad conductors.

• **Melting & Boiling point** - metals have high melting & boiling point except Na & K and non-metals have low melting points
metals can be drawn into wires unlike non-metals.

2. K.

Satyendra Nath Bose

↓

- Father of the 'God Particle' in New York Times report.
- Indian physicist known for particle physics.
- Gave Planck's Law
- famous "Bose-Einstein statics"

Homi Jehangir Bhabha

↓

- A nuclear physicist, he theoretically explained 'cascade showers' in cosmic rays.
- pioneered the research work on nuclear physics in India.
- played role in developing countries Nuclear Energy Programme.
- Became 1st Chairman of Indian Atomic Energy Commissions
- 1st director of 'Tata Institute of Fundamental Research' (TIFR)
- also became president of First United nation's conference on 'Peaceful uses of Atomic Energy'

2. L.

Let cost price of table be x

when sold at 13% profit, so

Selling price = 1.13x

Now,

when sold at 18% profit selling price = 1.18x

Given

25 rupees more = 5% profit.

5% = 25

Then, $100\% = \frac{25}{5} \times 100$

$= 500$ Rupees.

C.P. of table = 500 ₹.

3. A. Unwanted and unusable materials regarded as substance of no use. Waste can be seen as garbage in our soursounding. There are various types of waste depending on their characters, composition, form etc—

→ On the basis of its form —

- Liquid waste - contains waste water, sludges, detergents which can be poisnous.
- solid waste - garbage, plastic waste, glass & ceramics, metal, tins, paper etc.
- Organic waste - waste which can be decomposed & turned into manure.
- Recyclable waste — Metals, furniture can be recycled.
- Hazardous waste — which is toxic, corrosive & reactive eg. Industrial water.

→ On the basis of sources —

- Domestic waste — sewage or water generated from homes, leaves, vegetables, excreta etc.
- Commercial waste - Plastic, paper etc produced from shops, offices etc.

Industrial waste - waste from factories & industries plastic, glass, contaminated water

Agricultural waste - waste from agricultural field such as weed, husk, cattle waste etc.

On the basis of decomposition -

Biodegradable waste - waste which could be decomposed over a period of time eg. household waste, garden waste etc.

Non-Biodegradable waste — which cannot be decomposed but can be reused like glass, plastics etc.

E-waste - electronic waste forming the largest portion of waste these days scraped mobile phones, laptops, T.V. etc.

Management of these waste is a difficult task as with increasing population, waste is increasing also in double amount. The best technique to manage waste is 3R's.

Reduce → • best way to manage waste especially solid waste.

• cut back the use of things. Reduce the commodities you want to buy.

• stay away from disposable things.

• Buy in bulk amount instead of smaller amounts

Reuse → • This method is the most popular one. Reuse means instead of throwing it you are using it again it means you are creating new thing from old one.

• using reusable containers rather than plastic one.

for eg. using jam, sauce jar in kitchen.

Recycle → process of remanufacturing a product to be sold as new one.

• this is the last option after reduce & reuse.

• As recycling itself requires energy so, it's less preferred as compared to two other.

various initiatives have been taken at domestic level as well so that people could accept these

3R's and Fourth 'R' Replace have been used as replacing plastics with other biodegradable containers.

3. B.

Health is a state of complete physical, mental social well being and not merely an absence of disease.

Any substance which found in excess in body or is deficient causes a diseases.

There are various kinds of Diseases →

Communicable Diseases

↓

- caused by harmful bacteria, virus, fungi, protozoa etc
- they transmit through air, water, food, physical touch.

→ smallpox - caused by virus through infected objects saliva, indirectly through persons.
- vaccination prevents the disease.

→ Measles - - by RNA virus
- eyes becomes red, headache, fever.
- injections of antibodies, vaccination.

→ AIDS - - caused by HIV virus.
- weakens the immune system.
- No vaccine of this disease.

→ Tuberculosis - • caused by bacteria.
• infection can be caused by drinking infected milk, droplet infection.
• BCG is a prevention.

→ Plague — • spread by bite of rat, and can spread from droplet infections.
• affects the lungs.
• vaccine and drugs are given.

Non-communicable Disease

↓

Disease which donot transmit or communicate through the infectious person to healthy person.
They can be allergy, degenerative disease, genetic disease.

→ Cancer - • cause irregular growth of tissue is cancerous disease.
• can be in any part lungs, breast, brain etc.
• Chemotherapy is given to patient.

→ Heart disease - • Heart failure, Heart blockage etc.
• surgical operations can be a solution.

→ Vitamin Deficiencies - deficiency of vitamins such as A, B, B12, K etc.
- due to no proper diet, insufficient protein, vitamin in body.
- vegetables, fruits, food sources are good options.

→ Allergies - • unusual reaction to a particular substance → food item, dust, medicine etc.
• breaking problem, acne, rashes etc.
• medication, injections, preventive cure.

→ Haemophilia - • body's unability to clot the blood.
• It's an genetic disorder carried by daughters of family.
• Prevention is medication, immediate doctors consultation.

Both communicable and non-communicable diseases are life-threating if proper attention is not given to the symptoms. Consulting a Doctor is important in order to prevent it in initial stage as Preventive cure is a must for healthy body.

प्रश्न संख्या

मुख्य परीक्षा
म.प्र राज्य सेवा लोक आयोग

3. D

Bio Technology -

Biotechnology is industrial use of microorganisms and living plant & animal cells to produce substances beneficial to people.

Characters →

It involves genetic manipulation, manufacture of antibiotics, vitamins, other vaccines etc.

It is growing organisms like yeast, bacteria, under controlled conditions in devices known as bioreactors.

Brewing oldest form of biotechnology.

From anticancer drugs to vitamin tablets, & from biomass fuels to detergents are part of discoveries of biotechnology.

Biotechnology has a broad range of application in today scenario in various areas.

industries which are gm crops.

4) Fuel & Fodder - . Use of tissue culture technique
. Biomass → source of carbon
. Methane & liquid ethanol obtained out of Biomass.

5) Environment - . detection of microbiological contaminants
. Bioremediation, clean up of pollution such as Oil slicks.

6) Biosensors - . development of Biosensors which are capable of detecting low level of hormones, pollutants, gases etc.
. Police & doctors uses for detecting drugs in humans.

7) Animal Husbandary - . embryo transplantation.
. cloning of embryos.
. artifical insemnations.

Biotechnology is being useful in every sector and National Biotechnology Development Strategy 2015-2020 - have been presented by Indian Government.

Applications

1) **Medicine** - • to produce antibiotics.
• hormones for treating people are now produced by microorganisms modified genetically.
• Factor VIII, for clotting blood is manufactured in industries.

2) **Agriculture** - helps in productivity & diversity of agriculture produce.
• genetically engineered crop plants
• tissue culture technique.
• Best example is Hybrid seeds, product of union of two different genotypes.
• development of artificial & synthetic seeds.

3) **Food industries** - • yeast for brewing, baking (common)
• nutritional supplements, pharmaceuticals.
• genetically modified food items from food grains.
• artificial sweeteners containing lactic acids.
• Food items soya, tomato, potato used in