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Name of Candidate : Shubham Singla

Roll No. : PTTP220310

Registration Number : ..... Date of Examination : 08 Aug, 2023

Exam Centre : Old Rajinder Nagar ☐ Bhopal ☐ Online ☑

Test - 3 **Code : TC073**

MTS IGP Batch 2023

GENERAL INSTRUCTIONS

This Question-cum Answer (QCA) Booklet contains 56 pages. Immediately on receipt of the booklet, please check that this QCA booklet does not have any misprint or torn or missing pages or items, etc. If so, get it replaced by a fresh QCA booklet.

Candidates must read the instructions on this page and the following pages carefully before attempting the paper.

Candidates should attempt the questions strictly in accordance with the instructions specified in the question paper and in the space prescribed under each question in the booklet. Any answer written outside the space allotted may not be given credit.

Question paper will be provided separately and can be taken by the candidates after conclusion of the exam.

.....

SUBJECT/PAPER
GENERAL STUDIES

Invigilator's Sign. : .....

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(For filling by Examiners only)

Evaluator Code :

Q.No	Pg No.	Maximum Marks	Marks	Total
1	1			
2	3			
3	5			
4	7			
5	9			
6	11			
7	13			
8	15			
9	17			
10	19			
11	21			
12	24			
13	27			
14	30			
15	33			
16	36			
17	39			
18	42			
19	45			
20	48			
Grand Total				

Signature

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Q.1 अप्रत्याशित कर (विंडफॉल टैक्स) से आप क्या समझते हैं? क्या आपको लगता है कि अप्रत्याशित करों से संपदा का प्रभावी ढंग से पुनर्वितरण हो सकता है और अधिक आर्थिक समानता को बढ़ावा मिल सकता है?

(150 शब्दों में उत्तर दीजिए) 10 अंक

What do you understand by Windfall tax? Do you think that windfall taxes can effectively redistribute wealth and promote greater economic equality? (Answer in 150 words) 10 Marks

Windfall tax is used to tax the sudden increase in profits of company especially oil marketing companies due to external factors.

Eg India imposed windfall tax on crude oil companies due to rise in petro-diesel prices amid Russia - Ukraine war.

Significance: Redistribute Wealth
Promote economic Equality

① More development expenditure by government due to increased revenue. Eg Education, Health

② Poor - Negatively Affected due to Inflation via High Price
↓
Subsidy by Government

Eg CPI > 6% in 2022-23.

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write on this

(3) Subsidy increases for poor

eg PM Ujjawala Yojna

(4) Reduce inequalities - Gini Coefficient ~0.83

↓

Poor income increase

Rich income decrease.

Not Effective

(1) Corruption - Misuse of Resources

eg CWG, 2G Scam

(2) Temporary measure

eg Windfall tax reduced to zero later

(3) Companies pass on burden to people (Incidence of tax) → Inflation

Need to ensure effective implementation of policies and programmes to foster economic growth and innovation. Development should be guided by "Sabka Sath, Sabka Vikas, Sabka Vishwas, Sabka Prayas".

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Q.2 नई मौद्रिक नीति समिति (एमपीसी) व्यवस्था के अंतर्गत मुद्रास्फीति लक्ष्यीकरण को क्रियान्वित करने की कथित सफलताओं और चुनौतियों पर चर्चा कीजिए। (150 शब्दों में उत्तर दीजिए) 10 अंक

Discuss the perceived successes and challenges of implementing inflation targeting under the new Monetary Policy Committee (MPC) regime. (Answer in 150 words) 10 Marks

The Monetary Policy Committee (MPC) is tasked with adjusting policy rate (repo) to ensure flexible inflation targetting policy.

Inflation Target – 4% ± 2% tolerance level (CPI Inflation)

Success of Inflation Targetting

① Reduce price for consumers → Poor benefitted

② Bimonthly meetings → Regulation check.

③ Flexible ensures Economic growth.

eg: Policy Rate unchanged since last two MPC meetings

④ Private Sector benefit → Objectives clear → Anticipate MPC policy rate.

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⑤ If Inflation beyond tolerance band → for 3 quarters → Report to government

⑥ Predict inflation for coming quarters → Increase certainity

Challenges → * Global Crude oil prices → Drive Inflation

① Inflation due to supply side factors → Global supply chain risks
↓
MPC can't control

② Trickle Down effect takes time to kick in → Banks don't change rate instantly.

③ Growth objective may be compromised

Eg Tomato price due to weather.

Need to follow **Urjit Patel committee** recommendations with effective FRBM implementation to keep inflation in check.

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Q.3 भारत में सतत् कृषि को बढ़ावा देने और खाद्य सुरक्षा में सुधार के लिए मोटे अनाज उत्पादन की क्षमता का आकलन कीजिए। (150 शब्दों में उत्तर दीजिए) 10 अंक

Assess the potential of millet production in promoting sustainable agriculture and improving food security in India. (Answer in 150 words) 10 Marks

Millets are grown in India contributing to 80% of Asian production and 20% global.

Major Millets – Jowar, Bajra, Ragi
– Pearl Millets

Potential for Sustainable Agriculture →
① Drought resistance (70% of agriculture prone to monsoon vagaries)
② Uses less water
eg Rice uses 3000 kg/L
③ Enrich soil with nutrients → Increase soil fertility.
④ Low fertilizer usage → Promote soil Health

eg Green Revolution led to N:P:K use in 8:2:2.4:1

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Improving food security

① Increase productivity (major crop pro dependence)

② Increase nutrients in food → Address triple burden of malnutrition

③ Grown in rainfed areas (56% rainfed)

④ Cheap to buy

Steps Taken →

① UN declared 2023 as International year of Millets

② Dongria Kondh tribe promoting millets in Odisha

③ Increased MSP, credit availability

④ Food processing in millets
Eg Startups like Tagz food

Need to promote in line of PM vision of declaring them as "Shree Anna" with increased R & D investment.

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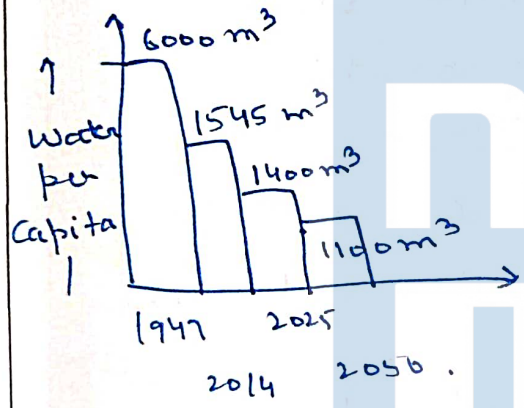
Q.4 जल जीवन मिशन में पेयजल की उपलब्धता और पेयजल तक पहुँच में क्षेत्रीय विषमता को समाप्त करने का सामर्थ्य है। मिशन के महत्त्व पर प्रकाश डालते हुए, वांछित उद्देश्यों की प्राप्ति में अंतर्निहित बाधाओं पर चर्चा कीजिए।

(150 शब्दों में उत्तर दीजिए) 10 अंक

Jal Jeevan Mission has the potential to end the regional disparity in the availability and accessibility of drinking water. Highlighting the significance of the mission, discuss the underlying impediments in achieving the desired objectives.

(Answer in 150 words) 10 Marks

Jal Jeevan Mission aims to provide functional tap connection to all rural household by 2024.



The graph shows that water scarcity is an issue.

Regional Disparity

↳ Droughts due to low rainfall in Central India

↳ Delhi facing water crisis (Tanker for water)

Women travelling → kilometres to draw water in Haryana.

Significance of Mission

① Address water shortage in rural areas

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② Providing clean drinking water
(16 states have Arsenic contamination)

③ Increase economic productivity for women

④ Fulfill SDG 6 - Clean water and sanitation

⑤ Reduce Poverty

Challenges
- ① Lack of awareness about scheme
- ② Bureaucratic red tapism, corruption
- ③ lack of funds for implementation
- ④ water wastage
  - Eg submersible pumps. (70% groundwater for agriculture)

Along with JJM, need to promote rainwater harvesting, promoting sustainable use, water ATMs, AMRUT to ensure SDG 1, 2, 6, 8 are fulfilled

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Q.5 बैटरी ऊर्जा भंडारण प्रणाली (बीईएसएस) से आप क्या समझते हैं? इसके अनुप्रयोगों पर चर्चा कीजिए और यह भारत के ऊर्जा कार्यक्रम में किस प्रकार क्रांतिकारी बदलाव ला सकता है। (150 शब्दों में उत्तर दीजिए) 10 अंक

What do you understand by Battery Energy Storage Systems (BESS)? Discuss its applications and how it can revolutionize the energy program of India. (Answer in 150 words) 10 Marks

Battery Energy storage systems are used to store energy produced in a device called battery for future use.

eg Li-ion battery.

Applications →

1. Transport
   - Hydrogen fuel cell vehicles
   - Electric vehicles
     - eg Buses, cars
     - Ola scooty
2. Electricity
   - Store Solar Energy
   - Wind Energy Storage
   - Address intermittency issue
3. Homes
   - Cells in TV Remote.
   - Battery for powering robots.

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Car
wri

Revolutinize Energy Programme

① Reduce fossil fuel dependency
↓
Import Bill reduced → Forex Save

② Achieve NDC under Paris Agreement → Green Economy

③ Promote Jobs and economic growth → New plants for battery manufacture

④ Easy transportation of energy in difficult areas (Hilly Terrain)

Government Steps
- PLI in Advanced Chemical Cells
- FAME II Scheme increase funding

Need to promote academia Industry linkage coupled with investment in R&D by private sector to ensure 24×7 energy

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Q.6 इसरो के गगनयान मिशन में हुए विकास और उपस्थित चुनौतियों पर संक्षिप्त चर्चा कीजिए। समाज के लिए मिशन के संभावित लाभ क्या हैं? (150 शब्दों में उत्तर दीजिए) 10 अंक

Discuss in brief developments and challenges in the Gaganyaan mission of ISRO. What are the possible benefits of the mission for the society? (Answer in 150 words) 10 Marks

Gaganyaan mission of ISRO is set to be launched in 2024 which attempts to send a crewed mission to outer space.

Developments
- ① Training of Astronauts in Russia completed.
- ② Vyomitra robot to be sent soon.
- ③ Design of vehicle completed – 300-400 km for 3 astronauts
- ④ Habitable Crew module + Crew Escape System + Orbital module – completed with Russia's Help.

Challenges
- ① High Cost of mission
- ② Inexperience in such missions

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③ Dependence on foreign agencies for numerous parts and technology

④ Delays ~~to~~ due ~~to~~ COVID (Earlier planned in 2022)

Benefits — ① Attract young people in sciences and space

② Join elite ~~club~~ club of nations
↳ Increase global prestige

③ Study outer space
↓
Increased R & D for future missions

④ Boom to India's space sector (eg Expected 48% CAGR)

India needs to invest in R & D with opening up of private sector participation. This will lead to India becoming a global power and fulfill aim of developed by 2047.

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7 "जलवायु परिवर्तन और प्रदूषण से निपटने की हमारी खोज में हरित हाइड्रोजन एक सरल और जादुई समाधान हो सकता है"। भारत के राष्ट्रीय हरित हाइड्रोजन मिशन के आलोक में कथन का आलोचनात्मक विश्लेषण कीजिए।

(150 शब्दों में उत्तर दीजिए) 10 अंक

"Green hydrogen can be the silver bullet in our quest to tackle climate change and pollution". Critically analyze the statement in light of India's National Green Hydrogen mission.

(Answer in 150 words) 10 Marks

Green Hydrogen is produced by the electrolysis of water using renewable electricity.

National Green Hydrogen Mission

- Aim of 5 MMT of Hydrogen by 2030.
- Investment ~ ₹ 1 lakh crore
- 6 lakh new jobs

Role in Climate Change

1. Reduce green House gas emissions
2. Source of renewable energy
   - Use in H-fuel vehicles
   - Use for electricity generation
3. Fulfill India's target of Net Zero by 2070.

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Role to tackle Pollution

↓

Large vehicles in Metro cities

↓

Make clean air

Produce water as by product

↓

PM-10, 2.5 reduce

(Eg Top 22 out of 30 most polluted cities in India)

Challenges

1. Flammable
2. Difficult storage and Transportation
3. Costly - Technology not available
4. Low Private Sector participation

India needs to promote R & D in Green Hydrogen. Steps such as

① Waiver of Inter state transmission Charges for 25 years

② I2U2 and Quad initiatives for Green Hydrogen in India will help India in achieving its Panchamrit target and fulfilling SDG 6, 11, 14, 15.

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.8 हाल ही में जोशीमठ, उत्तराखंड में आई आपदा के आलोक में, हिमालय क्षेत्र में आपदा प्रबंधन और पर्यावरण संरक्षण के लिए मुख्य सबक क्या हैं? (150 शब्दों में उत्तर दीजिए) 10 अंक

What are the key lessons for disaster management and environmental conservation in the Himalayan region, in light of the recent disaster in Joshimath, Uttarakhand? (Answer in 150 words) 10 Marks

The recent **land subsidence** **at Joshimath** has highlighted importance of disaster management in Himalayan region.

Key issues — ① Rapid Industrialization
eg Hydropower Projects.
② Tourism - Unsustainable.
③ Urbanization - Houses construction
④ Lack of EIA
⑤ Awareness low among citizens.

Lessons for Disaster Management

① Follow recommendations of MC Mishra committee
② Proper Early warning System
③ Network of radars to identify Cloud burst eg Kedarnath floods

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④ Disaster mapping and vulnerable areas ~~isoti~~ identification.

⑤ Preparation of emergency response plans eg Evacuation during GLOF in Uttarakhand.

⑥ Afforestation - terrace farming - Bunds

Lessons for Environmental Conservation

- Identify Seismic Zones
  - eg Jashimath on Vaikunta Thrust
- Reduce pollution and Climate Change
  - → Sustainable Tourism
    - eg Sustainable Tourist body in Swiss Alps
- EIA of Projects

Need to follow NDMA guidelines and Deepak Chopra committee recommendations + focus on environmental conservation under National Mission for Sustainable Himalayan Ecosystem

"The recent radical trends in Punjab show that the Khalistan issue is still simmering." Discuss the statement with respect to recent developments and suggest measures to handle it.

(Answer in 150 words) 10 Marks

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The recent attack on police station by a group of protestors for release of an accused in Punjab highlights the Khalistan issue.

Recent Developments →

1. Rise of Waris Punjab De Chief - Amritpal Singh
   ↓
   Comparison with Jarnail Singh Bhindarwala (Extremist)
2. Attack on Indian missions in USA, UK and Canada
3. Protest rallies against arrest of Amritpal Singh.
4. Arrest of Amritpal Singh and supporters under NSA, 1980.

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→ Demand for Khalistan - Secessionist Demands

Measures to Handle it →

① Deradicalisation of youth of Punjab - use of social media - local leaders for awareness

② Reducing drug trafficking in Punjab

③ Action against radical organisations and leaders such as Sikh for Justice in Canada

④ Contact Indian mission abroad ↓ Collaborate with foreign governments for crackdown

⑤ Socio-economic development of region to reduce alienation

Need to follow an all-round approach coupled with socio-economic development and arrest to ensure unity and integrity

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10 ड्रोन संचालन में आसानी और साथ ही इसके संचालक की अनामिता, भारत की सीमा सुरक्षा की चुनौतियों में वृद्धि करती है। विस्तारपूर्वक वर्णन कीजिए और सीमावर्ती क्षेत्रों में ड्रोन समस्या से निपटने के लिए सुझाव दीजिए।

(150 शब्दों में उत्तर दीजिए) 10 अंक

The anonymity and ease of drone operation contribute to the challenges of India's border security. Elaborate and give suggestions to tackle the drone problem in border areas.

(Answer in 150 words) 10 Marks

Drone is an aircraft that is remotely controlled or autonomous to operate.

Challenges in Border Areas →

① Use for droping explosives

eg Attack on J & K army base

② Dropping drugs across border.

eg Punjab border drugs

③ Not detected by radar - Fly low.

④ Cheaper than military aircrafts

⑤ Easy to operate across borders from far-off distances.

⑥ Lack of awareness and expertise in tackling drone warfare -

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Suggestions →

① Use of Radio jammers, GPS spoofing (sending different waves) to capture drone.

② Help from locals in border areas to look out for drones

③ Indigenous R&D, training to develop anti drone technology

④ MoU with foreign countries for renting / purchasing drones

eg Sea Guardian from US.

Steps Taken

- DRDO developed Controlling Unarmed autonomous System (CUAS)
- Lakshya Drone for (by DRDO) Intelligence Gathering
- Liberalised Drones Rules, 2021

Need to ensure regular training of armed forces to reduce new emerging threats

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11 विद्युत संशोधन विधेयक, 2022 उपभोक्ताओं, डिस्कॉम के साथ–साथ पर्यावरण के लिए कई लाभ प्रस्तुत करता है। सविस्तार वर्णन कीजिए। साथ ही इसकी कमियों को भी सूचीबद्ध कीजिए और उन्हें दूर करने के लिए कुछ उपायों का भी सुझाव दीजिए।

(250 शब्दों में उत्तर दीजिए) 15 अंक

Electricity Amendment Bill, 2022 brings several advantages for consumers, DISCOMs as well as the environment. Elaborate. Also, list out its shortcomings and suggest some measures to overcome them.

(Answer in 250 words) 15 Marks

Electricity Amendment Bill was introduced to improve transmission and distribution of electricity.

Advantages for Consumers

1. Right to consistent electricity
2. Rules for selling excess renewable energy at rooftop (PM KUSOM).
3. Improved Customer service digitization.

Advantages for Discoms

1. Reducing losses
2. Private sector Participation (Delhi Distribution losses reduced from 53% to 8% after privatization)
3. Renewable energy certification to fulfill RPO obligations
4. Tariffs increase

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Advantage for Environment

- Increased focus on Renewable energy
- Mandatory treatment of flue gases by Thermal Power Plants (Precipitators etc)
- Increased flue gas utilization in road construction etc.

(Utilization increased from 10% in 1996 to 92% in 2022)

Short comings

① Rules not identified
② Issue of implementation
↓
No special courts
③ Vague terms
④ Against cooperative federalism.

Measures →

① Time bound rule formulation
② Set up electricity authority

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at national and state level to hear grievances.

(3) Time bound Clearance of dues of renewable producers by DISCOMs made mandatory

(4) Public comments and opinion on the rules.

(5) Subsidy to DISCOMs for increasing efficiency.

Electricity distribution needs reforms based on schemes like UDAY, ADITYA. Need to shift towards renewable to fulfill panchamrita targets

- 50% of electricity from non fossil ~~renewable~~ fuel
- 500 GW of Renewable energy

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Q.12 भारतीय प्रतिभूति एवं विनिमय बोर्ड (सेबी) शेयर बाजार के नियमन और निवेशकों के हितों की सुरक्षा में महत्त्वपूर्ण भूमिका निभाता है। दिये गए कथन के आलोक में, सेबी के समक्ष आने वाली चुनौतियों पर प्रकाश डालिए और इस संबंध में सुधारों का सुझाव दीजिये। (250 शब्दों में उत्तर दीजिए) 15 अंक

Securities and Exchange Board of India (SEBI) plays an important role in the regulation of the share market and safeguarding the interests of investors. In the light of given statement, highlight the challenges faced by the SEBI and suggest reforms in this regard. (Answer in 250 words) 15 Marks

SEBI was made a statutory body in 1992 to increase its effectiveness and safeguard the interest of investors.

Role in Regulation of share markd and safeguarding investors

1. Ensure ~~the~~ eradication of BADLA system
2. Introduced T+1 settlement
3. Equal opportunity to all brokers and traders
4. Prevent Insider trading and manipulation of shares
   - eg Harshad Mehtat in 1992
5. Investors fund for protection
6. Introduced circuit breakers

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Challenges Faced →

1. Co-location Scam of NSE.
2. No control on OTC markets
3. Complex insider trading transactions
4. Corruption and Red tapism in working of SEBI.
5. Quantitative easing by US based investors → Sudden crashes.
6. High valuation of new age startups in IPOs
   - Eg Paytm shares crashed by 75% since IPO price in 2022.

Reforms → 1. Autonomous working
   - Reduce political interference
2. Transparency in functioning
3. Regular audit of exchanges and brokers Eg NSE, Zerodha

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(4) more detailed rules on trading

(5) Standardize contracts
~~key~~ futures, options

(6) Awareness generation among retail investors.

(7) Prevent over-priced IPOs.

(8) SEBI forms backbone of stockmarket in India and needs to incorporation new guidelines such as on ESG norms, Social Exchange.

By developing strong and deep market, more investment can be brought in to achieve aim of 5 trillion USD economy by 2025.

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Q.13 भारतीय अर्थव्यवस्था में एक प्रमुख योगदानकर्ता होने के बावजूद, कृषि क्षेत्र कई बाधाओं से ग्रस्त है जो इसकी वृद्धि और विकास में बाधा डालते हैं। इन बाधाओं पर काबू पाने में प्रौद्योगिकी की भूमिका पर चर्चा कीजिए।

(250 शब्दों में उत्तर दीजिए) 15 अंक

Despite being a major contributor to the Indian economy, the agriculture sector is plagued by several constraints that impede its growth and development. Discuss the role of technology in overcoming these constraints.

(Answer in 250 words) 15 Marks

Technology is at forefront of new age agricultural revolution for rapid growth

Agriculture
- 18% of GDP
- 45% of Employment
- Female Employment
- Food security.
- 50 billion USD exports in 2022.

Constraints	Technology Use.
(1) Fragmented land Holdings (86% Small and marginal farmers)	(1) Use of drones for land records digitization (SVAMITV Scheme)
	(2) Awareness about cooperatives via social media

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(2) Lack of Credit	(1) Big Data and AI to analyze credit history - Quick approval of loans (2) Agri-Stack
(3) Lack of Seed Availability for small farmers	(1) Online information about Seed banks (2) Drones to spray seeds
(4) Weather Issue [70% production vulnerable to monsoon vagaries	(1) Mobile SMS about weather (2) GEMINI device for fisherman (3) BHUVAM portal (4) m-KISAN initiative
(5) Post Harvest Losses [40% - FAO] MSP to only 6% farmers [Haryana Punjab]	(1) e-NAM - Online Price Discovery (2) Cold Chain Infrastructure eg: ~~PM~~ AIF fund. (3) Tractors to transport (4) FPI promote

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⑥ Irrigation (50% rainfed) 5-10% Drip Irrigation	① Promote drip and sprinkler irrigation ② Sensors to automatically water crops
⑦ Fertilizers (N:P:K - 8.2:2.4:1) Recommended (4:2:1)	① Fertigation Techniques → GM crops / Herbicide tolerant ② m-Kisan for info on fertilizers ③ Nano-UREA
⑧ Soil fertility Decreasing	① Soil Health Cards scheme ② Sensors
⑨ Awareness lacking	① Use of Internet (eg) e-Chaupal Initiative of ITC.

Need to follow recommendations of Ashok Dalwai committee, promote Custom Hiring Centres and scale neutral machinery to double farmers income turning them into agripreneurs.

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Q.14 पर्यावरण एवं प्राकृतिक संसाधनों पर सिंचाई के प्रभाव का मूल्यांकन कीजिए, और कृषि में सिंचाई पद्धतियों की संधारणीयता और समता सुनिश्चित करने के लिए उपाय सुझाएँ। (250 शब्दों में उत्तर दीजिए) 15 अंक

Evaluate the impact of irrigation on the environment and natural resources, and suggest measures to ensure the sustainability and equity of irrigation practices in agriculture.

(Answer in 250 words) 15 Marks

Indian agriculture is 50% rainfed with nearly 5-10% drip and sprinkler irrigation.

Irrigation - Practice of watering plants to sustain their growth.

Impact on Environment

① Salinisation of soil
⇒ Canal irrigation in Punjab.

② Release of GHG.
⇒ Paddy flooding release methane.

③ Soil fertility - Reduces.

④ Ground water pollution
↓
Fertilizers seep into ground water.

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Effect on Natural Resources

1. Soil erosion increases due to excess irrigation
2. Lead to eutrophication or algal bloom
3. Kill useful bacteria and microorganism
4. Reduces groundwater table and river water.

   Eg → 130% groundwater Utilization in North States

Measures →

1. Promote micro irrigation techniques like drip and sprinkler
2. Awareness generation
3. Promote fertigation – To increase fertilizer intake

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④ Restriction on ~~ge~~ ground water usage. - Central Groundwater Authority to frame rules.

⑤ Promote less water intensive crops like millets inplace of sugarcane, rice

⑥ Promote solar pumps under PM KUSUM scheme.

⑦ Reduce ~~short~~ harmful electricity subsidies on pumps

⑧ Incentives and subsidy for micro irrigation, millets.

Schemes like PM Krishi Sinchayee Yojana, Per drop more crop, Haryali scheme can ensure equity in agriculture guided by Sabka Sath, Sabka Vikas

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परमाणु ऊर्जा और अंतरिक्ष प्रौद्योगिकी के क्षेत्र में क्रमशः डॉ. होमी जहाँगीर भाभा और डॉ. विक्रम अंबालाल साराभाई के योगदान से भारत को रणनीतिक रूप से किस प्रकार लाभ हुआ? (250 शब्दों में उत्तर दीजिए) 15 अंक

How India benefitted strategically from the contributions of Dr. Homi Jehangir Bhabha and Dr. Vikram Ambalal Sarabhai in the fields of atomic energy and space technology respectively?

(Answer in 250 words) 15 Marks

Dr Jahangir Baba and Dr. Vikram Sarabhai are considered pioneer in Indian technological advancement contributing since time of independence.

Sarabhai contribution →

① Foundation of Indian space programme - led to the establishment of ISRO later.

② Foundation of IIMs in India for management education.

③ Latest technology - 1st telecast on TV using radio waves with help of satellite

↓

Information dissemination.

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(4) Latest technology in mills @ Ahmedabad

(5) Role model for aspiring scientists in space programme (APJ Abdul Kalam mentored by him)

Contribution of Dr Jehangir Baba

(1) Foundation of 3 stage nuclear programme
- Pressurised Heavy water Reactor
- fast Breeder Reactor
- Advanced Heavy water Reactor.

(2) Constructed 1st nuclear reactor - Apsara

(3) Laid foundation of Atomic Energy Commission and acted as its chairman.

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④ Led to formation of Bhaba Atomic Research Centre (BARC) and NPCIL

⑤ Laid foundation of TIFR for higher studies.

⑥ Envisaged the creation of nuclear bomb — Operation Smiling Buddha in 1974.
↓
For nuclear deterrence.

· Thus, Both Bhabha and Sarabhai laid the base of modern R & D in space and nuclear energy which formed the basis of Atmanirbhar Bharat in modern times.

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Q.16 जेनरेटिव एआई निकट भविष्य में नवाचार की सीमाओं को आगे बढ़ाने का सामर्थ्य रखता है, फिर भी इसका सामाजिक प्रभाव पर्याप्त चुनौतियाँ खड़ी करता है। सविस्तार उत्तर दीजिए। (250 शब्दों में उत्तर दीजिए) 15 अंक

Genreative AI holds the potential to push the boundaries of innovation in the near future, yet its societal impact raises substantial challenges. Elaborate. (Answer in 250 words) 15 Marks

Generative AI is a branch of Artificial Intelligence that generates content, words, sentences on its own.

Based on Different models
- Transformer model
- Generative Adversarial Networks
- Auto-encoders.

Recent Advancement
- Chat GPT by Open AI
- BARD by Google
- DALLE for image generation

Potential for Innovation →

① Economic
- Increase economic growth
- Automation of Jobs
- New Jobs
  - Prompt Engineer.

Reduce crime (NAFRS)

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Social – Education – Increase reach
- Innovation
- Personalized content
- Vernacular language Translation

Health – Diagonsis of Diseases.
Tele medicine

E-Commerce – Recommending products
Virtual Assistant like SIRI

Write innovative content for people, Basic programs, identify bugs in software.

Challenges →

① Biases – Trained on data present on internet which is biased.

eg Greatest leaders of All-time on Google show male leaders

② Self Delusion → Generate false content

③ Cheating → In university exams, assignments, schools.

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(4) Cost of running — large energy for training → Fossil fuel based

(5) Piracy may increase

(6) Reduce innovation of students → Cognitive development.

Need for global cooperation and regulation of Generative AI to reduce its harmful effects. [Global Partnership on AI]

This may be the single biggest revolution of our life just like electricity and hence needs to be used properly.

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Q.17 नवंबर 2022 में मिस्र में COP27 संयुक्त राष्ट्र जलवायु परिवर्तन सम्मेलन में लॉन्च किये गए "जलवायु के लिए मैंग्रोव गठबंधन" के उद्देश्य को स्पष्ट कीजिए। उष्णकटिबंधीय देशों की तटीय पारिस्थितिकी को बनाए रखने में मैंग्रोव के महत्त्व पर विस्तार से प्रकाश डालिए।

(250 शब्दों में उत्तर दीजिए) 15 अंक

Explain the purpose of the "Mangrove Alliance for Climate" launched at the COP27 UN Climate Change Conference in Egypt in November 2022. Elaborate on the importance of mangroves in maintaining the coastal ecology of tropical nations.

(Answer in 250 words) 15 Marks

Mangroves are salt tolerant plant varieties that grow in marshy and salty areas.

Purpose of Mangrove Alliance for Climate (MAC)

↳ To conserve mangroves
↳ Halting their deforestation
↳ Planting mangroves along coast
↳ Increased awareness

Importance →

Economic
- Coastal Economy is supported
- Source of livelihood for people
- Fishes support food.

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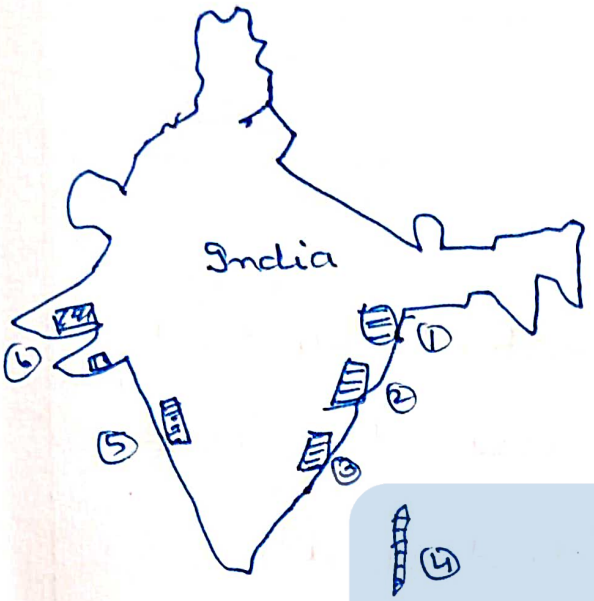
Environmental
1. Cyclone damage Absorb eg Kasa cyclone
2. Biofilters.
3. Gives clean Air.
4. Purify water.
5. Support biodiversity
   - Crabs, fishes.

Cultural
1. Aesthetic Value
2. Tourism Potential
   - eg Sunderbans National Park in Bengal
3. Source of wood for tropical nations

Challenges
1. Urbanization
   - Deforestation
2. Industrialization
3. Damage by storms, floods, Tsunami
4. Forest fires / Slash and burn agriculture

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Shaded Area gives mangrove location in India.

(1) - West Bengal (Sunderbans)
(2) Odisha
(3) Andhra Pradesh
(4) A & N Island
(5) Mumbai - Goa
(6) Gujarat.

Steps taken →

(1) Planting mangroves under **MISHTI Scheme** announced in Budget.

(2) **MAC Alliance** launched at COP 27

Need to conserve and plant mangroves. so that **Panchamrit aim** of India can be achieved

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Q.18 आपदा प्रतिरोधी बुनियादी ढाँचे के लिए गठबंधन का गठन भारत में आपदा प्रबंधन दृष्टिकोण को और अधिक मजबूती प्रदान करता है। टिप्पणी कीजिए। भारत में आपदाओं से निपटने के लिए एक नई रणनीति की आवश्यकता के औचित्य सिद्ध कीजिए। (250 शब्दों में उत्तर दीजिए) 15 अंक

The Formation of the Coalition for Disaster Resilient Infrastructure brings more robustness to the Disaster Management approach in India. Comment and justify the need for a new strategy to tackle Disasters in India. (Answer in 250 words) 15 Marks

CDRI was launched by India in 2019 to address the issue of disaster and reduce its impact- at International Climate Summit.

Importance of CDRI → Based on 4 Approaches

1. Identify risk
2. Investing in Disaster Resilient Infrastructure
3. Incorporate disaster planning in government policies
4. Create awareness about risk and mitigation.

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Need For New Approach

Earlier Reactive approach

- Increasing frequency of disasters
  - (56% more cyclones in Arabian Sea in last decade)
  - Cyclone Biparjoy
  - Floods - Delhi
    - Assam
  - Land subsidence - Joshimath
  - Landslides

→ Lack of awareness among stakeholders.

→ Increasing vulnerability.

- 33% coastline prone to erosion
- 12% prone to landslide
- 33% Chronically drought prone
- Earthquakes in Gujarat (Bhuj 2001)

Steps Required

① Constitute National Disaster Risk management fund and similarly to state with a component for risk mitigation

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(a) → Recommendations of 15th Finance commission to be followed.

(b) NDMA Act 2005 - Implementation

(c) Training, Guidelines, Awareness generation

(d) Early warning, Map of Vulnerability India

India needs to act together with global leaders in tackling rising disaster risk and reducing its effect.

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Q.19 महत्त्वपूर्ण बुनियादी ढाँचे (क्रिटिकल इंफ्रास्ट्रक्चर) और प्रमुख निगमों को लक्षित करने वाले रैंसमवेयर हमलों में हुई हालिया वृद्धि ने मजबूत साइबर सुरक्षा उपायों और नीतियों की तत्काल आवश्यकता पर प्रकाश डाला है। इस प्रवृत्ति में योगदान देने वाले प्रमुख कारकों पर चर्चा करते हुए, विभिन्न क्षेत्रों पर इन हमलों के प्रभाव का विश्लेषण कीजिए।

(250 शब्दों में उत्तर दीजिए) 15 अंक

The recent rise in ransomware attacks targeting critical infrastructure and major corporations has highlighted the urgent need for stronger cybersecurity measures and policies. Discussing the key factors contributing to this trend, analyze the impact of these attacks on various sectors.

(Answer in 250 words) 15 Marks

The recent attack by Red Echo group via Shadowpad on Mumbai Power Grid highlighting rising ransomware attacks on critical infrastructure.

Reasons for Attack
- State sponsored Attacks
- For cryptocurrency
- Demand money

Impact
- Loss of money (AIIMS Attack)
- Data Privacy Issue
- Vulnerable to cyber warfare.
- Country security under Attack - Nuclear Installations

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→ Use for Cyber Terrorism

→ .

Steps Taken

(1) NCIIPC created

(2) CERT-IN - to reduce attack

(3) Cyber crime cells in police

(4) Cyberdome of Kerala Policy

(5) Botnet and Malware Analysis Centre

(6) Cyber Swachchta Kendra.

(7) National Cyber Security Coordination Centre

(8) Cyber Security Policy

(9) Implement Personal Data Protection Bill

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follow recommendations of Rao Indrajit committee to reduce cyber attack and ensure safe, secure India.

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Q.20 सीमा सुरक्षा के संदर्भ में, तटीय और स्थलीय सीमाओं के प्रभावी और कुशल प्रबंधन को सुनिश्चित करने के लिए विभिन्न सुरक्षा एजेंसियों के बीच सहयोग और समन्वय को कैसे बेहतर बनाया जा सकता है?

(250 शब्दों में उत्तर दीजिए) 15 अंक

In the context of border security, how can cooperation and coordination between different security agencies be improved to ensure effective and efficient management of coastal and terrestrial borders?

(Answer in 250 words) 15 Marks

~~Bor~~ India has a large border of 15000 Km^2.

Different Security Agency

↳ B.S.F — Indo-Pak Border and Bangladesh

↳ ITBP — Indo-China Border.

↳ Sashastra Seema Bal — Indo-Nepal Bhutan Border

↳ Indian Coast Guard / Navy / Marine Police Force — Coastal Security

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Ans.

Ways to improve cooperation

1. Clearly defining responsibility
2. CDS post - Joint Action
3. Regular meetings between security agencies
4. ~~Drills~~ Security exercises and drills together.
5. Bring under single ministry - Ministry of Defence.
6. Training together.
7. Increased human Resource and funds
8. CIBMS - Use of Technology AI, Satellite Sensors
9. Social Media monitoring.

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(10) Vibrant Village Programme

Following Recommendations of Shuktakar Committee on Border Security can address new emerging threats and ensure territorial integrity of India.