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Roll No. : MT23RCAPA011

Registration Number : ..... **Date of Examination :** 14/8/23

Exam Centre : Old Rajinder Nagar ☐ Bhopal ☐ Online ☑

Test - 3 **Code : TC705**

RCA 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.

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.....

SUBJECT/PAPER
GENERAL STUDIES

Invigilator's Sign. : .....

[To be filled by the STUDENT]

Student's Queries for the Evaluator (if any write them below)

[To be filled by the EXAMINER]

Evaluator's response

(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

MACRO COMMENTS

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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

Recently, the Govt was speculating imposition of windfall tax on luxury items and sin goods.

Windfall tax are additional large surcharges that are imposed for revenue generation through broadening of tax base and also a qualitative deterrence.

Can Windfall tax effectively redistribute wealth and promote greater economic equality

Yes

- Mostly put on selected high range goods. Hence, the basic goods remains unchanged
- Revenue can be used for social sector benefits. eg. Food security, capex.
- Can push consumption of other goods through reduction of taxes on essentials. eg. Cross subsidisation

Candidates must not write on this margin

→ High taxes on luxury item can check its import and save foreign reserve.

No

→ The volume of tax collated is too meagre to be redistributed.

→ Distortionary effect → It may hurt the market dynamics

↳ Further can lead to impact an economic growth.

↳ Reduction in taxes, loss of jobs, decrease in personal disposable income.

Hence, such windfall taxes can only be implemented through keeping in mind macroeconomic credentials and market sentiments

Candidates must not write on this margin

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

Monetary policy committee in its bimonthly ~~nov~~ review put hold on the repo rate keeping it same.

MPC was constituted as a 6 member body with member from RBI and government.

Purpose → Inflation targetting (2-6%).

Success → perceived

→ Inflation in this range → control on Headline inflation based on CPI through monetary policy instruments like repo rate.

→ Sustainable economic growth

→ Adequate liquidity management through monetary policy tools.

eg. Recent Incremental CRR to suck out excess liquidity.

Candidates must not write on this margin

→ Liquidity Management and credit Development
↳ Chennai Bank to allow monetary policy transmission through their MCLR rates in line with external benchmark

Perceived Challenges

↳ Lack of depth in capital Market
↳ Unable to provide credit supply.

↳ Lack of Monetary policy transmission
↳ Poor credit development.
↳ Lag in liquidity infusion.

↳ Fiscal policy not in align with Monetary policy → High public spending in counter cyclical phase nullifies financial repression of the bank.

MPC with all these challenges have managed to keep the projection of Inflation within stipulated range. There is need for more coherence between monetary and fiscal policy for robust growth

Candidates must not write on this margin

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

On the budget of 2023, Government announced its ambition "Three Anna" programme for promotion of Millet production

UN too have declared 2023 as the "International Year for Millet production)

- Potential of Millet
  - ↳ Sustainable Agriculture
    - → Climate Resilient Crop
      - ↳ low requirement of water eg. Bajra
      - ↳ Poor soil Suitable for growth eg. Kutki
      - ↳ Low Nutrient requirement eg. Ragi.
      - ↳ Use of ZBNF and Traditional Methods eg. Baiga practicing Organic cultivation of Millets

Candidates must not write on this margin

↳ Less use of chemical fertiliser
↳ prevent Surface runoff leading to Eutrophication ⇒ Algal bloom.

Improving food security

↳ Nutrient Rich
↳ tackle Hidden Hunger of deficiency in Micronutrients Iron

↳ Diversification of food basket ⇒ Shift from Cereal based to Nutri-based.

↳ India is Largest producer of Millets and have immense potential to ramp up the production.

Wayforward
↳ R&D in Millet Varieties.
↳ MSP regime and procurement through FCI
↳ Processing of Nutri Cereals.

Millets can be the gamechanger in this changing climatic and economic condition to bring equity with sustainability. (SDG Goal 1)

Candidates must not write on this margin

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

As per estimates, Indian rural households (85%) still don't have a piped water connection.

Jal Jeevan Mission was launched to address this challenge and provide Functional Tap in villages & urban areas

- Potential
  - Regional disparity ⇒ Geographical
  - Availability → water from rainfall heavy region can be piped to rainfall deficient region.
    - Drinking water connections houses in regular interval
  - Accessibility
    - Quota based water availability. eg. Free water supply to a limit.

Candidates must not write on this margin

Significance

- Basic requirement i.e. water to be made available
- Promote Watershed management through convergence of scheme
- Women need not to travel long distance for water collection.
- pushes Swachh Bharat Abhiyan operationalising toilets.

Impediments

- Rough Geographical terrain → Pipe Infrastructure
- Water Scarcity → India is a water scarce country. (1484/person)
- Public Investment
  - Lack of adequate fund devolution.
  - Lack of private infra investment
- Digitalization in department and
- Inertia through convergence of Schemes.
- Affordability of water connection.

Jal Jeevan can be a major leap in our one of the Panch Pran to make a "Developed India".

Candidates must not write on this margin

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 System is a mechanism of Staing power in the procen of chemical ~~reac~~ system inside the battery.

Battery is a collection of multiple cells and can be charged if reversible chemical reaction is possible.

- Application
  - Electrical Vehicle
    - Decarbonise the transportation
    - Battery swapping policy → to reduce dependence on fossil.
  - Housing & Residential Usage
    - Alternate power source.
  - Industrial Usage
    - Uninterrupted power supply.

eg. IT Industry → AI & ML system requires electricity.

Candidates must not write on this margin

How it can revolutionise energy program

↳ **Panchamrit target** → can aid to reduce the carbon emission by 50%.

↳ **Portable and Interoperable** → Ease of Usage.

↳ **Import dependence** on fossil to be reduced saving exchequer cost.

↳ **Efficiency** → prevent leakage of energy
↳ Economical at scale.

↳ Push renewable sources like Solar, wind reducing the effect of time based electricity production. eg. Solar only in Day and wind during windy day.

Battery Energy Storage system need infrastructure investment and push for R&D. Recent PLI scheme can aid to develop a robust supply chain for Battery infrastructure

Candidates must not write on this margin

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 to take Human to International Space Station i.e. Outer space.

Developments

- **GSLV-Mk III** Rocket is designed to take the people and Cargo Payload to lower earth orbit (LEOs).
- **Training Module** of Gaganyaan traveller
- Selection of the prescribed candidates
- Trial run of Gaganyaan to be conducted before actual flight

Challenges

- India is yet to devise the return module.
  - Development of thrust system

Candidates must not write on this margin

↳ Lack of prior experience
↳ Threat to Human life in case of failure
↳ International Space Station has its own module and rotation system. Gaganyaan need to be modified according to it.

Possible benefits

↳ Data collection → Aid future space program
↳ International space exploration
  ↳ Beyond Outer space
  ↳ Indian technological acumen
↳ Low cost space exploration
  ↳ Future market. eg. SpaceX.
↳ Earth Mantering Data
  ↳ Remote sensing
  ↳ Meteors, Asteroid Mineral composition

Gaganyaan is a leap in the technological path of India

Candidates must not write on this margin

Q.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 Mission Launched by government aim to produce Green Hydrogen and put forward a transition from fossil to fuel Cell.

Tackle Climate Change and pollution

↳ Clean energy source

↳ low pollution

↳ No Tropospheric Ozone

↳ Green Energy

↳ Low CO_2 Emission

↳ Less use fossil → prevent GHG emission

↳ No Ozone depletion

↳ prevent UV rays to enter

↳ Biodiversity loss → No mining & Quarrying

Candidates must not write on this margin

Challenges

- Cost → High cost at establishment
- Operational efficiency
- Lack of R&D
  - Lack of private investment
- Early Incubation Stage
  - EV Market picking up
  - Charging Infrastructure
- Handling Issues
  - Capacity building
- Raw Material → Import dependency in China

Way forward

- R&D Investment
- Setting of projects handled
- Exploration of Minerals → Rare Earth Metals

Candidates must not write on this margin

Q.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

Joshimath incident leading to land subsidence led to multiple challenges in disaster management

- Lesson
- Disaster Management
  - Disaster preparedness
    - In infrastructure and development projects
  - Disaster Mitigation
    - through capacity building of people
  - Disaster Response
    - Rehabilitation of affected
  - Environmental Sustainability
    - Don't encroach the river valley
    - Afforestation

Candidates must not write on this margin

Environment Conservation

- Afforestation → Biodiversity
  - River flow management
  - Sustainable construction
    Eg. Tehri Dam.
- Local rationale → Common traditional knowledge system to be employed.
- Way forward
  - Disaster Impact Assessment
    - Environment Impact Assessment
    - Social Audit of Infra Projects
  - No construction in river & Glacial valley.
  - Employ CDRI principles & Sendai framework (SECURE HIMALAYAS) It will help to keep the Himalayan sentinels on the National Mission on Himalayan Ecosystem

Candidates must not write on this margin

Q.9 "पंजाब में हालिया कट्टरपंथी रुझानों से पता चलता है कि खालिस्तान का मुद्दा अभी भी उबल रहा है।" हालिया घटनाक्रम के संबंध में कथन पर चर्चा कीजिए और इससे निपटने के उपाय सुझाएँ।

(150 शब्दों में उत्तर दीजिए) 10 अंक

"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

Khalistani is the ideology of demand of a theocratic state based on 'Sikhism'.

The Recent killings and protests by certain groups raised eyebrows for Khalistanism

→ Rise of Communal Incidents eg. Murder Attack on temple

→ Rally in protest of State and favour of Khalistani leader.

→ Rally in Canada & UK for Khalistan

→ Raid in Khalistani supports

Candidates must not write on this margin

Measures

↳ Confidence building with Tamil

↳ Winning Heart and Mind

↳ Counter propaganda

↳ Check Narco terrorism

↳ Check Cross border infiltration

↳ Counter Sedition literature

↳ Development and technology in the region.

Candidates must not write on this margin

Q.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

The era of invisible war led to rise in usage of drone technology.

It led to remote control modes attacks.

Anonymity Ease

- For a room or establishments
- Contact less
- low cost and low → Heavy Impact
- Accessibility ease
  - Supply in black markets

Challenges

- Difficult to Intercept
- Lacuna regulation → Leading to Impediment to development
- Control on technology

Candidates must not write on this margin

→ Public not aware

→ Cross border surveillance

Suggestions

↳ Digital Sky Platform → for registration of Drone

↳ Integrated Drone surveillance Management System

↳ Drone Cadre

↳ Capacity building in Drone tech.

↳ Army integration with Drones

↳ CERTIn

Drone attacks are going to change the security landscape and need international cooperation to dealt with.

Candidates must not write on this margin

Q.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 2022 deals with the changing need of consumers and shift in India's position from fossil based energy to green energy sources.

- Advantages
  - Consumers
    - Grievance Redressal Mechanism
      - About billing, supply consistencies
    - Cost ⇒ Scale.
      - Saves expenditure on electricity
    - Quality of Service
      - Private engagement put competition in the sector.
  - DISCOM
    - Integrated GRID ⇒ Allows supply in different regions

Candidates must not write on this margin

↳ ~~RPO → Renewable Purchase Obligation~~.

↳ Smart Metering

↳ check theft and ensure compliance

↳ Reduction in energy losses → Plant load factor

↳ Capital for technology investment

Environment

↳ Renewable Purchase Obligation ⇒

Development of Renewable energy market

↳ Push for R&D & investment in Renewable source like solar, wind, Hybrid

↳ Modular Nuclear plant setup can help in sustainable localised power sources

↳ Energy efficiency in buildings and industry

Shortcoming

↳ Lack of strong Regulatory Authority to ensure compliance.

↳ Private investment is speculative

↳ Sector is jammed with loss making companies

Candidates must not write on this margin

↳ Cross-Subsidisation disincentivises good quality of servic to Consumer

↳ Production skewed towards fossil
↳ More than 50%.

↳ Lack of penalty for Operations in case of consumer dissatisfaction
↳ Consumer can't always approach Consumer tribunal.

Measures

↳ Incentivisation to Private Player through credit linked subsidy

↳ Parity in rules and charges of different DISCOMS

↳ Use of Power Exchanges to determine market prices ⇒ to check predatory pricing

↳ Compliance of Renewable energy obligation.

↳ Incentivise convergence with PM KUSUM and rooftop solar schems for decentralised production.

Power Sector in India

need a revamp & this amendment is right step in direction of sustainable electricity consumption

Candidates must not write on this margin

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

Securities and Exchange Board of India (SEBI) is a statutory body formed in 1992.

- Role
  - → Regulation of Share Market
    - → Listing & Delisting of equity, Mutual fund etc on exchange
    - → Regulate the functioning of two major exchanges NSE, BSE
    - → Institutional support to firm launching Initial Public offer.
  - → Interest of Investor
    - → Vigilance over the share manipulation.
    - → Check on Insider trading and other unethical practices

Candidates must not write on this margin

↳ Circuit breaks in case of unprecedented rise or fall in market.

↳ Ensure transparency in decision making of companies through Annual reports, shareholder communication

Challenges faced

↳ **Lack of Penalizing power**

↳ More of a regulator. can't do much after any financial fraud etc

↳ **Institutional Challenges**

↳ Lack of Incorporated of latest technology like Artificial Intelligence and Machine learning to check frauds.

↳ Complex system of analysis, regulation and compliance.

↳ **Departmentalized Structure** ⇒

Different products like equity, Derivatives are intermixed.

Candidates must not write on this margin

↳ Lack of control on foreign exchanges
  ↳ FII and FDI inflow makes Indian market susceptible to external threats.

Reform needed

↳ Proper entry and exit module for companies in exchanges
↳ Use of frontier technology to automate the grievance clearance and balance sheet analysis
↳ System of cross check of reports of firms to its stakeholders
↳ compulsory corporate governance model reshuffle through independent director & auditor.
↳ Integrated system in equity, derivative segment for better regulation.

SEBI is a watchdog upon which the Retail Investors bank and its role is essential in Financial prudence of our economy.

Candidates must not write on this margin

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

Despite employing half of the population, Agriculture only accounts for 18% of GVA share.

- Major Contributer
  - Largest employer → private employment
  - Backbone of rural economy
  - Self sufficiency (Atma Nirbhartha) in food supplies.
  - Export → Earn foreign exchange.

- Plagued with Constraints ⟹
  - Poor capital Investment
    - Lack of storage units.
      - Loss of perishable Item
      - Distress selling of crops by farmers ⇒ low Income
  - Farmer Income
    - Land fragmentation lead to

Candidates must not write on this margin

inapplicability of economyofscale.
↳ High cost of HYV seeds, fertilisers pesticides.

↳ Lack of food processing infrastructure
↳ prevents value addition at farmgate.

↳ Unsustainable
↳ Water guzzling crops like Rice is major part of cropping pattern
↳ Due to MSP support.
↳ Low focus on Horticulture, Millets.
↳ India is a 'Net water exporter'

↳ Poor Technology Implementation
↳ Leading to Disguised unemployment
↳ Poor yield → Lack of efficiency.

↳ Middlemen and Hoarding

↳ Poor Agricultural Marketing and Extension services
↳ APMC Mandis not present everywhere
↳ Poor compliance

Candidates must not write on this margin

Role of Technology in Overcoming

- Solar technology ⇒ Power source for farm ↳ Income
  - ↳ PM-KUSUM
- DBT ⇒ Transfer of Subsidies & Credit
  - ↳ PM-KISAN, Kisan Credit Card
- Precision Agriculture ⇒ Efficient use of fertiliser
  - ↳ Kisan Drone ; Nano Urea
- Generative AI ⇒ Educate farmer through virtual reality
- Biotechnology ⇒ GM crops like ~~GE~~ BT Cotton
  - ↳ Gene editing
  - ↳ High Yield
  - ↳ Disease/Pest resistant
- GIS and Remote Sensing ⇒ Weather forecasting
  - ↳ Early warning system, e-Megh
  - ↳ SWAMITVA → Land Records
- Blockchain → Payment, Land Records.

Hence, Technology can be a key pillar in ensuring Saptarishi target of our economic policy.

Candidates must not write on this margin

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 heavily dependent on the irrigation facilities due to variability of Indian Monsoon and geographical variations.

Impact of Irrigation

Environment

↳ **Positive**

↳ Moisture of soil regained through irrigation

↳ Reclamation of wasteland through fallow method.

↳ **Negative**

↳ **Excess Irrigation** lead to leaching out of nutrient in runoff ⇒ Eutrophication of waterbodies.

Candidates must not write on this margin

↳ Water leads to capillary action causing salinization of soil and ~~reacts~~ o release GHG affecting Climate.

Natural Resources

↳ **Positive**

↳ Effective Irigation like Sprinkler Irigation enhance productivity and efficiency.

↳ **Negative**

↳ **Depletion of Groundwater**

↳ eg. Punjab banned groundwater use

↳ lead to contamination of Heavy Metals like Arsenic.

↳ **Soil Erosion** and Nutrient leading leading to poor Soil Quality → Unfit for Agriculture.

Measures for sustainability and equity

↳ **Metering of water supply** ⇒ Cost Induced

eg. 24x7 Metered water in Punjab

Candidates must not write on this margin

↳ Legislative measures | like use of rainfall in water Intensive crops, eg. Punjab, Haryana

↳ Use of GIS technology | ⇒ to check soil moisture ⇒ Suggest optimum usage of Irrigation to Kisan through Kisan Radio, SMS etc.

↳ Diversification of Crop
↳ From Rice to Horticulture, Pulse, Millets Sugarcane

↳ Watershed Management
↳ promote Tanka, Jalkund in Rajasthan.

↳ Use of Drones for precision farming

↳ New Methods like - Aquaponics to be employed.

↳ Mixed farming → Fish rearing with Paddy

↳ Direct Seeded Rice → 60% less water.

. A Sustainable Agriculture system can be a panacea in changing climate condition. We need a resilient farming architecture

Candidates must not write on this margin

Q.15 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 Homi Jahangir Bhabha and Vikram Ambalal Sarabhai are the pioneers of India's technological Journey.

Strategic benefits

Homi J Bhabha in Atomic energy

↳ He established Tata Institute of Fundamental Research → for cutting edge innovation.

↳ He pioneered the **Atomic reactor** for the Nuclear energy in collaborating with American Nuclear committee.

↳ Self sufficiency in energy resources

↳ Reduce dependence on coal and fossil.

Candidates must not write on this margin

↳ He envisioned the Nuclear programme of India → to protect India in a highly hostile neighbourhood.

↳ His initiative later translated into Operation Pokhran and Three Stage Nuclear development programme.

↳ India developed atomic bomb for deterrence and also keep developing Nuclear energy sources for its energy needs

Vikram Sarabhai in Space technology

↳ A staunch Gandhian, He envisioned the development of Indigenous rocket technology.

↳ He established INCOSPAR which later become ISRO – Space arm of India.

↳ He developed the earliest Rocket launching system and set base of Space exploration

Candidates must not write on this margin

→ He pivoted to Space programmes and Satellite Services

↳ To provide assistance in Weather phenomenon, Transmission of communication, Television etc.

↳ His engagement with NASA provides impetus to India's communication programmes

↳ Rocket System later give way to Missile technology - a key to India's Security.

↳ Space Exploration put India in league of few countries with Indigenous space technology

↳ Satellite Services

↳ Aid Agriculture, Disaster

↳ Navigation system → NAVIC

↳ Telecommunication revolution

Hence these two pioneer setup the foundation of Indian scientific journey

Candidates must not write on this margin

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

The launch of ChatGPT by OpenAI sent sensations across the digital world through latest Generative AI.

Generative AI is the machine model which is capable of producing responses like Humans through a Natural language learing mechanism, eg. BARD, Perplexity.

Potential
↳ Push boundaries of Innovation

→ Generative AI can revolutionise the content creation. eg. literary text poem.

→ Self automated coding
↳ Application based software development → on Instruction

Candidates must not write on this margin

- Automate Industrial Infrastructure
  - Replicate Human efficiency through Robotics
- Virtual Reality and Augmented Reality
  - Education ⇒ Kindergarten Students
    - Education from Home
    - Vocational training (Skilling)
  - Tourism ⇒ ~~Cheap~~ Economical experience
  - Check Data Breaches ⇒ Automated firewalls ⇒ Check Spyware.
- Societal Impact ⇒ Challenge
  - Mass unemployment
    - People loosing jobs which are labour intensive. eg. Manufacturing
  - Deep fakes
    - Pornography → AI generated
    - Women objectification.

Candidates must not write on this margin

↳ Bias and Prejudice
  ↳ Trained from prejudiced data
    eg. Recent google chat bot Tay going Racist comments.

↳ Supra Intelligence of Machine → Leading to Suppression of Human agency.

↳ Data Privacy
  ↳ Use of Personal data for training.
  ↳ Data leakages from Data Fiduciaries.

↳ Addiction to Children

↳ Accessibility ⟹ Digital Divide.

Generative AI can be a gamechanger in 4th Industrial revolution. But its application should be tightly monitored to prevent misuse of data and global security architecture of digital world

Candidates must not write on this margin

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

COP27 of UNFCC saw launching of "Mangrove Alliance for Climate" in lines with the ecosystem services offered by Natural resources to Humans.

Purpose of Mangrove Alliance for Climate

↳ **International cooperation** for Mangrove Conservation

↳ Threat to mangroove due to Coastal Agriculture

↳ Changing tidal and storm Pattern affecting mangroves.

↳ **Nature based Solution**

↳ Mangroves as Carbon sequestration source.

↳ Use of Natural resources for Climate Change mitigation.

Candidates must not write on this margin

↳ Sustainable Development Goal
  ↳ Life under water · (Goal 15).

↳ Rising Global temperature as per IPCC 6th Assessment report necessitates urgent steps in GHG emission control

↳ Net Zero Pledge framework.

Importance of Mangrove in coastal ecology

↳ Biodiversity
  ↳ Home to multiple species of flora and fauna.
    eg. Fishes, Plankton.

↳ Carbon sequestration
  ↳ Source of Blue Carbon.
  ↳ Oceanic carbon absorption.

↳ Water filtration
  ↳ of heavy metals like Ni, Co removed & filtered out by Mangrove

Candidates must not write on this margin

↳ **Coastal landscape Maintenance**

↳ Prevent coastal erosion

↳ Prevent tidal current and storm water to ingress the soil preventing salination of land.

↳ Source of wood and other resources like fruits, leaves to coastal communities.

~~Waiftoo~~ In Recent times, there is large scale mangrove deforestation threatening coastal ecosystem.

Need to implement MISHTI Programme and employ sustainable practices to preserve Mangrove vegetation.

Candidates must not write on this margin

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

Coalition for Disaster Resilient Infrastructure was launched in UN Climate Summit. It aims to allow the knowledge transfer in achieving resilience against Climate induced disaster risk.

Robustness to Disaster Management in India:

↳ **Disaster Mitigation**
- ↳ National ~~NDRF~~ Disaster Mitigation Fund.
- ↳ Focus on capacity building through local practices.

↳ **Disaster Risk Assessment**
- ↳ Use of Regional geographical Data
- ↳ Use of Remote Sensing and Weather processing technology (eg ocean SAT).

Candidates must not write on this margin

→ Disaster Preparedness

↳ Training for Disaster Response to public.

↳ Industrial compliance of safety measures to check chemical disaster like Bhopal Gas tragedy

→ Disaster Administration

↳ Tier structured response team.

↳ Convergence of different units of NDRF, SDRF, Indian Coastal Guard.

↳ International collaboration

↳ IRLS → for coastal area management

↳ Checking rising seawater threatening 7500 km coastline.

↳ Tsunami early warning system in Indian Ocean.

Need for new strategy

↳ Multisectoral engagement due to multilateral challenges. eg. Disasters

Candidates must not write on this margin

like Earthquake, Tsunami has multiple impacts in livelihood loss, Infra loss, Human loss.

↳ Sendai Framework to be streamlined with goals of CDR and NDMA.

↳ Disaster prevention to be prioritised especially in Human Induced disaster like Chemical Disaster, Development Induced disaster

↳ Stop at Hazard through Hazard Mapping and Management

↳ Intensity of disaster can overwhelm the entire country. eg. Turkey. Hence, Need a predetermined strategy to counter it.

One dimensional approach is not longer applicable in Disaster Management. The Climate change has aggrieved the frequency of disaster and it requires multi sectoral approach with Coherence and Collaboration to address it.

Candidates must not write on this margin

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

Recent breach of credit card details of a major banks highlighted the rising threat in invisible sphere of cyberworld.

Ransomware is a technique to get access of one account/device and extract ransom in return of same.

eg. Petya, Blackzone attack.

- Rise in targetting Critical Infrastructure
  - Kudankulum Cyber Attack → Nuclear Plant
  - Bombay Electricity Grid → Power transmission loss
  - 117 Delhi Website Hack → Propaganda
  - Customer detail breach of corporation
    - → competition affected

Candidates must not write on this margin

Need for Strong Cybersecurity measures

- **Protect Critical Infrastructure**
  - It can handicap the administration.
- **Consumer protection**
  - Attacks on common people leading to financial losses through cybertheft.
- **Cyber Integrity**
  - Hinder the development and dispersal of Cyberworld
- **Dent in Confidence**
  - Sovereign power like State can't exercise authority over Cyberspace.
- **Hostile Countries** can use it for geostrategic ambitions.

Key factors contributing to attacks

- **Cyber Vulnerabilities**
  - Too much sensitive information on Internet
- **Increase in Digital footprints**
  - e-Services, Social Media
- **Lack of Understanding of Nuances**
  - Digital Divide

Candidates must not write on this margin

→ Development of disruptive technology
↳ Evolution of surveillance mechanism

→ Geo Strategic Cyber warfare
↳ 5th dimension of war.
↳ Cyber attack can handicap the security apparatus

Impact
↳ Defence → Major threat of Cyber warfare
→ Critical Weapon system like Nuclear Command

→ Finance → Breach of Credit Data
→ Transfer of funds (loan to institutions)
↳ financial integrity & Confidence

↳ Social Media → Personal exploitation through Pornography, Deepfakes

↳ Trade → Loss of data led to disintegration of supply chain nodes.

↳ Governance → Erosion of trust of public
→ Hamper State Sovereignty

Hence, India under CERT-In need a Robust Cyber Protection Architecture

Candidates must not write on this margin

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

India has a large land boundary exceding 15000 km and Coastal boundary of 7500 km. It put immense challenge in border management and security.

Different Securities Agencies like BSF, Assam Rifles, ITBP, SSB has territorial jurisdiction with regards to certain States.

Cooperation and Coordination

→ **Territorial**

↳ It will aid the free flow of information regarding border management.

→ Integrated operation against insurgency.

→ Efficient and Effective utilisation

Candidates must not write on this margin

of personnel.

→ Integration of units leads to better rhythm in operation involving all of them

→ Geographical variability can be tackled through local understanding or best practices of other units

→ Aid in Theatrisation of Armed forces for Integrated border Management

Coastal

↳ Indian Coastal Guard, Coastal police and Navy work in synergy to guard the coastal water

↳ Prevent the smuggling and Narco trade through water Channel

↳ Better surveillance over customs and port consignment

↳ Intelligence sharing regarding the susceptibility of illegal arms trade & goods

Candidates must not write on this margin

→ Patrolling and Monitoring of coastal water with regards to surveillance ships

Different Security Agencies were formed for the purpose of effective regional based defence system but their collaboration can aid in a holistic territorial and coastal security architecture

Candidates must not write on this margin

Space for Rough Work

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