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Name of Candidate : KORAPOTHULA SREEKAR RAJ

Roll No. : PTTP221185

Registration Number : ..... Date of Examination : 30-July-23 (9AM-12.15PM)

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.

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.....

SUBJECT/PAPER
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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			
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14	30			
15	33			
16	36			
17	39			
18	42			
19	45			
20	48			
Grand Total				

Signature

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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

Windfall tax can be understood as taxing supernatural gains attained by companies due to macro-economic factor.

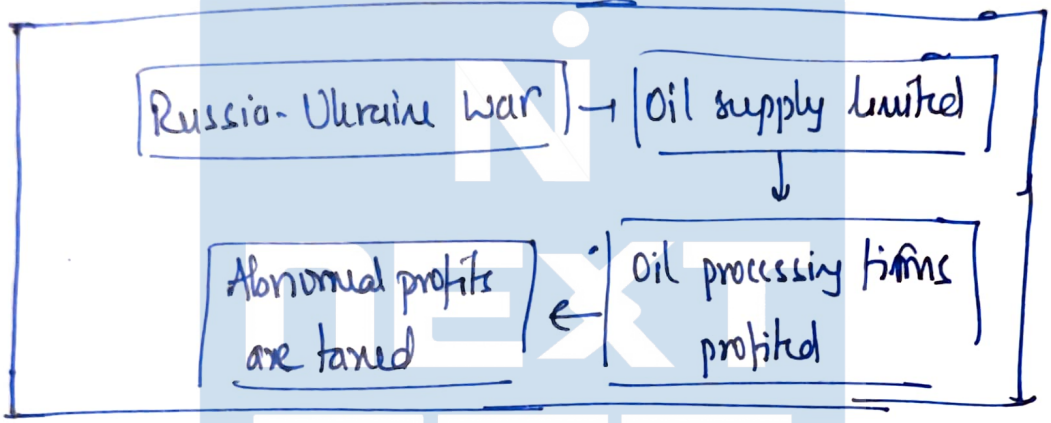


fig- Illustration of Windfall tax

Role of Windfall tax in redistribution:-

1) Windfall taxes increase revenue of exchequer instead of stakeholders.

↳ Eg:- Record dividends by Shell, BP

2) Reallocation of transfer income to all citizens

↳ Oil price rise impacts all while profits of Company impacts very few people.

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3) Welfare principle of state to take care of wellbeing of its citizens

4) BK Chaudhary Committee recommended windfall tax in India. Ex:- Windfall tax on Reliance (2023)

Impediments of Windfall tax

1) Disincentivizes innovation and risk taking due to appropriation of profits.

2) Against market principles of demand and supply.

3) Use of government on additional revenue is questionable. Ex:- Government spend on defence instead of public welfare

4) Risking capital flight due to policy irregularity.

Windfall tax has a double-edged effect which has serious implications on economic growth prospects and thus must be used judiciously and cautiously.

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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

Monetary Policy Committee (MPC) is tasked by the government to maintain the inflation levels between 2% - 6% through targeted measure.

Successes of implementing inflation targeting:-

1) Price stability promoting customer status-quo
   Eg:- Purchase of items.

2) Ensuring growth levels are sustainable as deflation and hyper inflation are detrimental to economy

3) Promoting developmental path of nation
   Eg:- Accomodatary path of MPC to promote growth
   Hawkish path of FRC(USA) - decrease growth

4) Historical success - MPC has worked in maintaining the inflation levels.

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Challenges of implementing inflation targeting:

1) Globalised world - The actions of MPC are interlinked with the actions of developed nations

2) Emerging concepts - The theory of Modern Monetary concept has questioned the credibility of inflation Targeting: Ex: Turkey (2023)

3) Interlinkage with fiscal policy - Influence of fiscal policy over inflation is understated.

4) Long gestation - The monetary policy actions take long time to reflect on inflationary levels.

While MPC is doing commendable job in inflation targeting, there needs to be greater collaboration between nations and within governments to limit inflation within perceived limits.

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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

With United Nations declaring International Year of Millets (2018-2023) and India promoting the production of Millets, there is rejuvenated interest on Millets.

Potential of millet in sustainable agriculture.

1) Millet production can be done in harsh climate.

2) Millets can be produced without significant water supply.

3) Millets are also resistant to several pests.

4) Labor involvement and fertilizer requirement are minimal for production of millets

5) Diverse nature of millet varieties suits several types of soil.

6) It requires minimal tilling, natural variants to promote its growth.

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Potential of millet in food security in India:-

1) Enables multiple cycles of production.

2) Can be used as an intercrop to promote productivity of field.

3) Higher harvest than other famous crops.

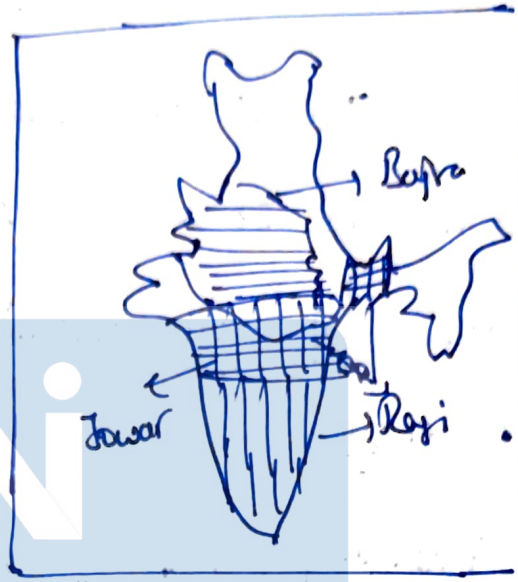


fig. Production of Millets

4) Broad acceptance among larger public

Eg:- Andhra Government school mandated distribution of "Ragi Maldda"

5) Also provides nutritional security - low glycemic index

Thus, Millets aid in sustainable agriculture and food security and thus its variants should be made widespread to promote its production and consumption.

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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 was announced during 2019-20 Budget Session, with an objective to provide tap-water connection to every household by 2024.

Significance ~~Potential~~ of Jal Jeevan Mission

1) Enabling access to tapwater in household.
2) Preventing the need to walk long hours to access potwater.
3) Emancipation of women as they are often given the duty to ensure access to water
4) Sense of security in the household without worrying about water quality and distribution
5) Reach of tap-water connections increased from 1/6th households to 60% households

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Impediments in achieving the objectives :-

1) Vastness - The sheer objectiveness with limited capacity of state is limiting its expansion

2) focusing on ends instead of means - National taps are being fitted without adequate underground connection

3) Lack of expansive audit has resulted in widespread discrepancies in its implementation.

4) Under-utilisation of budgetary allocation by local bodies due to inadequate training

Government has taken cognizance of the issues and delayed the objective beyond the target deadline to ensure adherence to right processes to achieve objectives.

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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 System (BESS) are technological means to store additional energy generated and store it for future consumption.

Applications of BESS:-

1) Solar energy generated during the day can be augmented by storing them in batteries.

2) Renewable energy production can be increased as per the storage limits instead of consumption

3) Electric vehicles can be produced and adopted easily with battery packs.

↳ Ex:- Scandinavian Countries

4) Providing Renewable energy supplies to companies, manufacturing units around the clock

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Role of BESS in revolutionizing energy problem:

1) Storage of renewable energy has largely remained a major hurdle in energy transition
2) BESS aids in relying solely on renewable energy, instead of using it as supplement.
3) BESS's applications are widespread and thus its adaptation will aid in achieving "Panchamrit" goals of India
4) Improve R&D on development of renewable energy production as BESS handles storage issues

Thus, BESS has tremendous impact on revolutionizing the reliance on fossil fuels and providing the thrust to renewable energy space in India.

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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

The establishment of Gaganyaan Mission has generated interest over development of ISRO as competitor to developed nation's space programmes

Developments of Gaganyaan Mission, ISRO:-

1) It will be carried on GSLV-Mk III engine
2) The astronauts will stay in lower earth orbit for 1 week
3) Indigenous development of space mission.
4) Gaganyaan is scheduled to launch in August, 2023.

Challenges in Gaganyaan mission:-

1) Human lives at risk
2) It is the 1st time ever India is attempting to launch humans into space. for prolonged duration
3) Global scrutiny against India as spacepower.

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Benefits of Gaganyaan mission:-

1) Global superpower status in space industry.
2) Enabling study of Earth from aerial view.
3) Ambitions of ISRO to promote Indian space sector
4) Innovation and R&D with private sector entry.
5) Employment will improve to develop space technology and allied sectors.
6) Establishing permanent space station in future

Thus, Gaganyaan Mission holds multi-faceted impact on the world and society and thus there are such high expectations across stakeholders on this project

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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 is deemed to be the solution to all climate related problems. It is produced through electrolyzer:

Impediments of National Green Hydrogen mission:-

1) Lack of established timeline to achieve the targets.

2) Green Hydrogen Mission doesn't have the roadmap in finance mobilisation and widespread utilisation

3) Poor R&D outlay deter the innovative spirit.

4) Poor establishment of funds with bureaucratic delays.

5) Lack of established global plan and its applications are still under process.

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Advantages of National Green Hydrogen Mission:-

1) Pioneer status to India if it can ideal the pathway to viability of Green Hydrogen.
2) Revolutionize industry and automobile market as green hydrogen has wide range applications.
2) Public private partnership to develop affordable green hydrogen generation.
4) Lofty vision to capture market share.

While green hydrogen has its limitations currently, National Green Hydrogen Mission unlocks the potential towards renewable and sustainable future with India as major partner.

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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 है? (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

Recent Joshimath crisis has usurped the need to balance economic growth and environment sustainability to protect lives and livelihoods.

Reasons for Joshimath crisis
- Unabated development
- Over-population, beyond carrying capacity
- Climate change and global warming induced weather patterns

Lessons for Disaster Management:-

1) Preparation / Pre-Disaster:-

1.1) Local level analysis on risk probability

1.2) Detailed developmental plan

1.3) Environmental Hazard mapping - landslide, earthquake

1.4) Construction & safety norms

2) Disaster

2.1) Reliant supply chain - food, clothing

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2.2) Support from NDRF, Indian Army

2.3) Update over events and safe locations

3) Post-Disaster:-

3.1) Evaluation of safeguarding measures

Augment Support Mitigate mistakes

3.2) Developing resilient infrastructure

3.2) Helping citizens resume their life, livelihood

Measures for Environmental Conservation:-

1) Adherence to carrying capacity to prevent hazards

2) Introduction of Environmentally sustainable tourism through minimizing waste and e-vehicles.

3) Waste segregation and management

4) Overseeing Environmental Impact Assessment (EIA) in holistic manner

MC Mishra (1978) Committee recommendations must be implemented to safeguard Himalayan ecosystem and economic growth

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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

The surge in protests related to Khalistan in India and abroad established that the past wounds are still prevalent, thus causing security issue for India.

Reasons for rise of Khalistan issues.

1) Ethnic ties beyond border regions
   - Eg: India-Pakistan - Sikhs - Kartarpur Corridor
2) Fear of annihilation into homogenous culture.
   - Eg: Increased affluence towards Western culture
3) Social media and technology enabling easy modes of radicalisation and extremism
4) Linkages with Organized Crime and overseas funding networks. Eg: Canada, United Kingdom
5) Deep hatred over Indian government tensions of the past.

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Government steps taken:-

1) Aggression. Arresting individuals who are spreading hatred, threatening peace in nation
2) Diplomatic talks to ensure law and order, peace to the Indian diaspora in foreign countries

Way forward:-

1) Aggression
   - 1.1) Utilising force to capture criminals and individuals spreading hatred
   - 1.2) International collaboration to mitigate threats

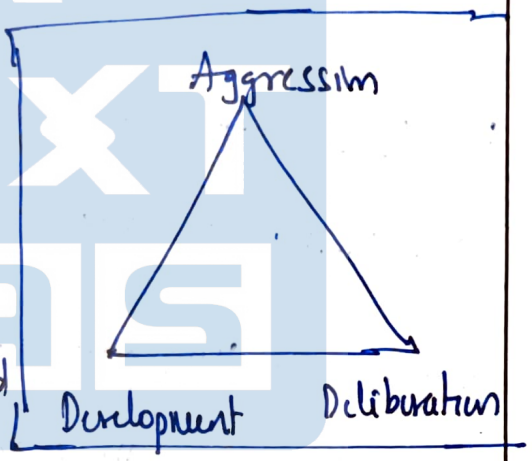


Fig- Means to tackle extremism

2) Development of regions and further integration
3) Deliberation with religious leaders to pacify issues

As Gandhi states, "An eye for an eye makes the whole world blind", thus all parties should come together and find amicable settlement through peaceful manner.

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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 development of drone technology has became a security nightmare to Border forces, leading to increased presence of forces and expense

Challenges of drones to Indian Border Security:-

1) Supply chains - Drones are used to provide army ammunition to carry terrorist attacks

2) Attack on army base - Drones are used as bombs and attacked on army unit. Ex:- Kashmir (2022)

3) Organized crime - Drones are transporting illegal drugs, FICN across border = economic damage

4) Surveillance - Drones are analysing the forward structure of Border security.

5) Inability to deter crime - It is difficult to take proactive measure due to porous nature and long boundary

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Suggestions to tackle drone problems along border:-

1) Border liason officers - Interaction and detailed plan to expand support to mitigate drone problem.

2) Technology - Utilisation of jammer, anti-drone technology to cut radio signals.

3) Stringent penalty and regulations to establish No-fly zones along sensitive areas.

4) Surveillance - Utilising drones to scan the skies and installing automatic movement detection.

5) Budgetary allocation towards R&D to develop drones and anti-drone technology.

Drones have double-edged effect, which can be managed through establishing norms on identifying the owner of drone through ID-tracking, establish regulations around purchase of long-range drones.

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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

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The promulgation of Electricity Amendment Bill (2022) has created divergent views among stakeholders about the objective and validity of bill

Advantages of Electricity Amendment Bill, 2022:-

1) Consumers:

1.1) Increased choice for consumers.

1.2) Availability of net-metering - Consumers can send generated renewable energy to grid.

1.3) Provision for smart meters - Cost known beforehand

Enables judicious consumption of electricity

1.4) Increased competition among suppliers aids benefits to consumers

Bill allow entrance of private players

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2) DISCOMs:-

2.1) Convenience in agreements with state governments

2.2) Deadline on payments to DISCOMs and possible penalties for delayed deferment

2.3) Adding renewable source of energy to increase capacity.

3) Environment:-

3.1) Increased provision for renewable energy.

3.2) Decrease fossil fuel consumption

3.3) Streamlining transition towards green future

3.4) Climate market to trade

Shortcomings of 'Electricity Amendment Bill':-

1) Centralization:- State governments believe that the bill centralizes authority.

2) Solar energy production remains idle, thus DISCOM's additional capacity will lead to storage issues and dispatch delays.

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3) Private players may cherry pick profitable markets, leaving DISCOMs to potential losses

4) Lack of timeline to install smart meters

5) Market mechanism of climate market are not yet established.

Measures to overcome issues:-

1) Working group to detail the plans and vision of the bill with Standard Operating Procedures

2) Explaining the viability of DISCOMs amidst entrance of private players through financial projections.

3) Enabling affordable renewable energy space to decrease burden of cost and maintenance on people

4) Independent authority to address grievances

Electricity Amendment Bill, 2022 augurs well in achieving the promising "Panchamrit" goal and drive India towards green and sustainable future

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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 दीजिये) 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 derive its power from SEBI Act, 1992 and acts as quasi-judicial body to ensure ethical market practices and protect investors.

Issues with SEBI

- **Past**
  - Harshad Mehta
- **Present**
  - Adani-Hindenburg fiasco
  - National Stock exchange (NSE)

Challenges with SEBI:- [Share markets]

1) Proxy nature of FPIs:- Lack of established identity prohibits in identifying the source of funds.

2) Reactionary steps:- The measures of SEBI are brandished to be reactionary. [Ex:-] Adani case

3) Macro-environment - Interlinkages with globalised world make it difficult to control global shocks. [Ex:-] COVID erasing investor gains

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4) Rise of alternate currencies - The use of cryptocurrency and tokens have added challenges to market fluctuation

5) Disclosure norms - Company disclosures are often complicated and generalised, thus making it difficult to identify. (Eg:- Expenses as "Others".

Challenges with SEBI - Individual investors:-

1) Lack of awareness - The COVID spurt on investors due to low interests led to increased losses (Eg:- Investor education by trading platforms)

2) Inside trading - Difficult to ascertain private messages unless the action is analysed. Reactionary.

3) Sheer quantity of investors, transactions and stakeholders involved makes any changes to existing structure ~~delayed~~ delayed.

4) Penny stocks - Offers high returns through social media. (Eg:- Telegram advice groups,

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Measures / Reforms to protect market and investors

1) Malyam Committee recommendations:

1.1) Disclosure of promoter.

1.2) Financing to be transparent

1.3) Book-keeper should be vigilant in dealing with public companies

2) Technology - Utilizing Big Data models to detect anomaly patterns in transactions.

3) Multi-layered approach - Differentiating risk as per company's marketshare and risk profile

It is imperative that SEBI takes corrective action to protect investor sentiment about India's economic growth story and maintain trust of investors.

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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

Agriculture sector contributes 17% to India's GDP and employs ~40% of India's workforce, thus becoming an integral part of India's economy.

Challenges of Agriculture sector:

1) Climate change - Altering weather patterns damages standing crops and harvest seasons. Ex: Punjab (2023)

2) Low use of pesticide and fertilizer in comparision to developed economies.

3) Fragmented land - According to Agri Census (2015-16), 84% of land owners are small and marginal.

4) Agriculture as sustenance method - lack of investment and upgradation of sowing methods.

5) Loans and debt - Increasing farmer suicides, NCRB - highest suicides are by farmers

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6) Limitations on contract farming due to legal complications and fragmented land parcels

Role of technology in agricultural development:

(1) Pre-harvest/Pre-production:

1.1) Soil health through technology
↳ Eg:- Bhu-Parikshak by IIT Kanpur

1.2) Availability of genetic seeds appropriated to suit local conditions. Eg:- Bt-cotton.

1.3) Selection of harvest method on the basis of available means accessed through technology.

(2) Harvest / Production phase:-

2.1) Surveillance - Utilizing CCTV's, Drone for active monitoring of farm lands.

2.2) Irrigation - Mechanized distribution of water, fertilizers and nutrients.

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2.3) forecasting the optimum time for plantation to reap harvests.

(3) Post-harvest :-

3.1) Price discovery through markets - e-NAM, share market (commodities)

3.2) Agreement to sell produce globally. Eg: e-NAM, agri portals.

3.3) Cold storage, technologically equipped to ensure longer shelf life

Agriculture policy should mould itself from supply-driven to investor-driven, aims with reliability and sustainability to ensure livelihood and economic growth through agriculture

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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

Agriculture in India face a trilemma of global competitiveness, sustainability and productivity and irrigation provides a promising solution to resolve it

Positive impact of Irrigation:

1) Availability of water as it is critical ingredient.
2) Ensure food security
3) Improve productivity of the farmers.
4) Augmented revenue generation
5) Ability to withstand extreme climate - drought, less rainfall

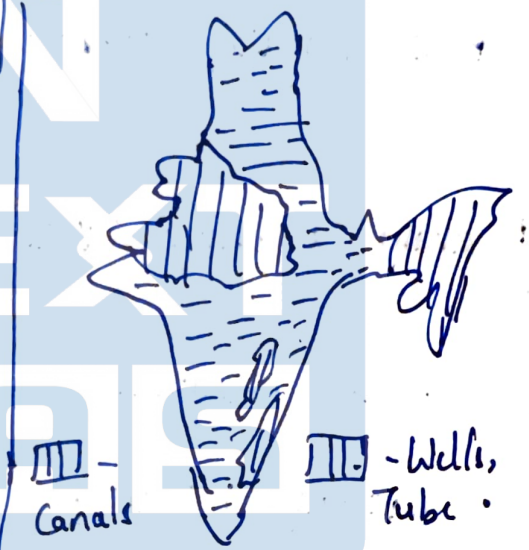


fig- Irrigation in India

Negative impact of irrigation:-

1) Tragedy of commons - Unscrupulous use of water without intergenerational empathy.

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2) Lack of systematic evaluation on the right amount of consumption.

3) Ancient structures - Canals and wells are archaic, leading to leakage and erosion. → Ex: UNESCO award for 6 canals

4) Leaching of harmful substances causes diseases, thus decreasing revenue potential

Measure to ensure sustainability through irrigation:

1) Engaging community to rightful consumption of irrigation resources

2) forecasting the future distribution and promoting alternate methods. → Ex: Jain irrigation.

3) Engaging with foreign nations to gain best practices → Ex: Israel irrigation methods utilising waste water for irrigation

4) Access to resources. - farmers should be incentivised or regulated to adopt sustainable practices.

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Measures to ensure equity in irrigation practices

1) Zoning of land parcels and promoting similar irrigation practice on basis of crop, water availability
2) Social audit systems to check on irrigation practices under the aegis of Gram Sabha.
3) Promote collective farming to ensure group decision making
4) Formation of farmers Production Organization (FPO's) to rationalise utilisation of irrigation resources

Thus, suitable irrigation measures can be utilised to ensure productivity and sustainability in agriculture. As MS Swaminathan said, "future belongs to those who have grains."

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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

The fields of Indian science is indebted to contributions of Dr. Homi Bhabha and Dr. Vikram Sarabhai for their immense contributions.

Contributions of ~~Dr. Homi~~ Dr. Homi Bhabha

1) Played critical role in initial atomic energy experiments.
2) Collaborated with international experts to develop indigenous technologies.
3) He was pivotal in the establishment of DRDO - pivotal arms in defense technology
4) Promoted viable development strategies of atomic energy and its applications for India

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Contributions of Dr. Vikram Sarabhai :-

1) He contributed towards the development of space technology.

2) His role was critical in the establishment of Indian Space Research Organization (ISRO)

3) Promoted proliferation of science & technology into young minds of India

4) Development of indigenous technology that was pivotal in the launch of Aryabhatta mission

5) The superpower status of ISRO lends its credit to contribution of Dr. Sarabhai

The immaculate contributions of Dr Homi Bhabha and Dr. Vikram Sarabhai has spurred the scientific development of ~~scientific~~ atomic energy and space technology in India.

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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 can be understood as an extension of Artificial Intelligence with an ability to reproduce content on the basis prompt provided by the user.

Potential of Generative AI

1) Medical:- Alphafold AI has the ability to decipher protein structure, aids in designing cure for deleterious diseases.

2) Productivity - Generative AI raises the productivity by automating certain tasks, ~~enabli~~.

3) Higher order thinking:- Generative AI can take over functioning of menial tasks and promote scientific, philosophical research

4) Climate change:- UNEP used AI to predict timelines for glacial melting,

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5) Minimizing inertia - Generative AI provides initial thoughts to start a task

↳ Ex: Outline against writer's blocks
Motivational phrases for work

Challenges for Generative AI

1) Demarcation of original and synthetic is extremely challenging. Ex: AI photos winning competitions

2) Potential risk is associated with end of humanity

↳ Ex: CAIS associated threat of AI with the risk of nuclear war

3) Inherent bias and prejudice against certain ethnic and gendered groups

↳ Ex: Amazon AI rejecting job applications of colored individuals

4) Individuality - People can increasingly develop bond with AI, instead of interacting with people.

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5) Trust and belief on Generative AI can lead to disastrous outcomes.

Eg:- AI prompting to attempt suicide, how to make explosives, kill someone etc

Measures to tackle ill-effects of Generative AI:-

1) Collective guardrails. Generative AI companies should come together to build guardrails.
2) Individual cognizance - Cross checking AI text and using it as a supplement.
3) Watermarking AI generated content to differentiate authentic and synthetic data.
4) Promote equitable access across world through digital literacy, expansion beyond English.

Generative AI is expected to proliferate irrespective of one's liking, so it is prudent to regulate to aid in human progress and development

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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

Mangrove play a critical role in ensuring the ecosystems of the world and the initiation of "Mangrove Alliance" is step in the right direction

Mangrove Alliance for Climate and Purpose,

1) It is initiated by UAE and Indonesia.

2) India is also member of the alliance

3) Purpose:-

3.1) Protecting Mangroves within national boundaries

3.2) Sharing best practices towards conservation

3.3) Expansion of mangroves as protection measure

3.4) Proliferation and extraction of economic return from Mangroves

3.5) Stakeholder interaction with experts

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towards safeguarding Mangrove habitats against climate change.

Importance of Mangroves :-

1) Disaster management :-

1.1) Mangroves act as 1st line of defense against natural disasters - cyclones, tidal wave

1.2) Provide as a relief measure by minimising the impact and influence. Eg :- Cyclone Amphan

2) Ecotone - Mangroves are ecotone and are home to several terrestrial and aquatic species.

3) Migration pattern of several species through the Mangroves of tropical forests.

4) Economic purpose - Mangroves aid in development of several economic opportunity due to presence of rich nutrients.

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Government steps taken:-

1) India has seen a rise in Mangrove coverage across coastal regions of Gujarat, Andaman and West Bengal.

2) India announced mangrove protection scheme in Budget 2023-24.

3) Enhanced protection for Mangrove region.

While 'Mangrove Alliance for Climate' is a step in right direction in acknowledging the importance of Mangroves, nations should promote its development through provisioning of finance and timely targets.

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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

Coalition for Disaster Resilient Infrastructure (CDRI) has commenced its operations in 2019 under the stewardship of India as founder to promote disaster management and infrastructure development.

Role of CDRI:

1) foster collaboration between nations about the best practices

↳ Ex: Hathi-Dhuni - Disaster resilient infrastructure in Himachal Pradesh

2) understand the strategies in preparation, mitigation and adaptation to disaster.

3) Share expertise of nations in disaster assistance and recovery. → Ex: Operation Gaurav by India to safeguard lives.

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4) Capacity augmentation against disasters to poor Island states.

Need for new strategy to tackle disasters in India

1) Polycrisis - Several regions in India are exposed to multiple hazards.
   - Eg: Himalayas - GLOF, Flash flood, cloudburst
     South India - Cyclones, floods, landslide.

2) Increased frequency - Adaptation is no longer the solution and steps towards mitigation to be prioritised

3) Sudden event - The probability of sudden rains, extreme heat, raise the risk of losing lives.

4) Economic growth to be sustained it is important that there exists plan for disaster management

5) Disaster migrants - Displaced population will find it difficult to displace and integrate into new locations

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Steps taken:-

1) Infrastructure for Resilience in Small Islands (IRIS) under CDRI. at CoP 26.

2) National Disaster Management Plan by India is approved in 2016.

3) Disaster Management exercise - PANEX, HADR.

Way forward:-

1) Global attention and decisions to mitigate and revert global change.

2) Enhance development of resilient infrastructure and promote its availability with affordability

3) Detailed action plan to safeguard populations.

As UN Chief Antonio Guiterres state,

"it is time for leaders for either collective action or collective suicide", prompting timely actions against climate change

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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 मे योगदान देने वाले प्रमुख कारको 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

According to world Economic forum, cyber-attacks increased by 151%, thus explaining the impending risk for cyber infrastructures and economy.

Attacks on critical infrastructure
- Colonial pipeline, USA
- AIIMS attack, 2022
- Aadhaar data,
- Kudankulam attack

Factors contributing to rise in cyber attacks

1) State-sponsored - Few states build/promote cybergroups to create imbalance in country.
   - Ex:- Russia sponsored groups - Lapsus, Turla
2) Lack of identity - It is difficult to ascertain the nation/individual attacking the infrastructure.

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Eg:- Masking identity, leaving intentional fake clues ↓ Russian hackers - Chinese language syntax

3) 5th domain of war - cyber proficiency as opened itself to cause disharmony in a country.

Eg:- China attack on ~~Govt~~ Hyderabad and Mumbai metro - Redecho.

4) Rise of universal currency such as cryptocurrency, tokens has enabled Ransomware as a Service (RaaS)

Eg:- Hive network - Marketplace for ransomware was intercepted by US FBI.

Impact of cyber attacks on various sectors -

1) Healthcare:- Increased digitisation means medical industry is susceptible to disruption

Eg:- Long queues at AIIMS during attack

2) Defense:- Leaking confidential information to adversaries. Eg:- DRDO honey trap incident (2023)

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3) Government administration - Potential advantage or interpretation of a nation will dent its image
↳ Ex: USA views on Russia-Ukraine situation

4) financial sector - Leaked credentials will erode trust in banking system and economic situation
↳ Ex: Cyberattack on HDFC Bank

Way forward
- Sydney Dialogue
- Tallinn Manual
- Collaboration within cyber agencies (Ex: Operation Synergy)
- Increased R&D in defensive capabilities - Sinkholing, etc

Cyberattacks are only becoming more ubiquitous and thus every stakeholder should protect their data, identity and governments should take stern action against perpetrators.

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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

India due to virtue of its geographical positon extends its natinal boundaries with 7 natins along land borders and contains over 7000+ km. coastal border, thus also providing security challenges

Need for cooperation between security agencies

1) Transfer of information about the details of extreme events. Eg:- Domestic informers

2) Expertise:- Local police has grater control over ground realities, while special guard has expertise in conducting operations.

3) Enhanced output - Working in silos leads to dissipation of optimum result due to lack of objectivity.

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4) Sharing best practices in handling different situations.

Impact of Coordination along coastal borders:

1) Aiming for drug free status. Coordination between India, Sri Lanka, Maldives Navy to prevent illegal transport.

2) Layers of protection: The prevalence of agencies and communication aid in protection of coastal border.

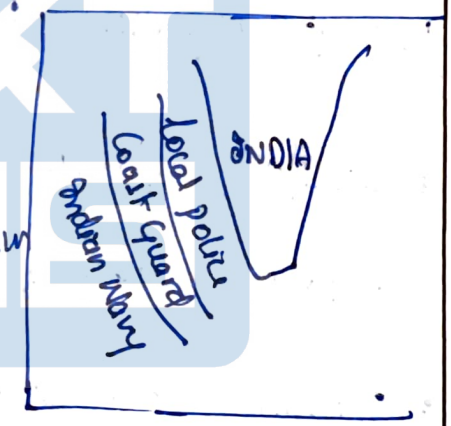


Fig:- Sphere of Influence

3) Prevent illegal immigration and invasion into territory.

4) Illegal movement of goods, wildlife can be mitigated with cooperation

5) Rationalization of resources.

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Impact of Coordination along terrestrial border :-

1) Understanding ground situation in better way.
   ↳ Eg:- Instabilities in ground operations of ITK
2) Spatial awareness of local police can help the guard forces to find optimum means to catch militants.
3) Madhukar Committee recommended integration of local police and Army in ITK region.
4) Technical abilities of several agencies can be used to catch illegal activity.

Border security is critical to maintain peace and tranquility in the region and cooperation along with coordination plays critical role in safeguarding coastal and terrestrial borders