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GENERAL STUDIES (TEST CODE : 1840)

Name of Candidate	CHAITANYA KHEMANI		
Medium Eng./Hindi	ENG	Registration Number	746087
Center		Date	30.08

INDEX TABLE			INSTRUCTIONS
Q. No.	Maximum Marks	Marks Obtained	
1	10		1. Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
2	10		उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न-पत्र कोड, विद्यार्थी क्रमांक आदि)।
3	10		2. There are TWENTY questions printed in ENGLISH & HINDI
4	10		इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
5	10		3. All questions are compulsory.
6	10		सभी प्रश्न अनिवार्य हैं।
7	10		4. The number of marks carried by a question/part is indicated against it.
8	10		प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
9	10		5. Answers must be written in the medium authorized in the Admission Certificate, which must be stated clearly on the cover of this Question-Cum-Answer (QCA) Booklet in the space provided. No marks will be given for answers written in medium other than the authorized one.
10	10		प्रश्नों के उत्तर उसी माध्यम में लिखे जाने चाहिए जिसका उल्लेख आपके प्रवेश पत्र में किया गया है और उस माध्यम का स्पष्ट उल्लेख प्रश्न-सह-उत्तर (क्यूसीए) पुस्तिका के मुख्य पृष्ठ पर अंकित निर्दिष्ट स्थान पर किया जाना चाहिए। उल्लिखित माध्यम के अतिरिक्त अन्य किसी माध्यम में लिए गए उत्तर पर कोई अंक नहीं मिलेंगे।
11	15		6. Word limit in questions, if specified, should be adhered to.
12	15		प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
13	15		7. Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
14	15		उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।
15	15		
16	15		
17	15		
18	15		
19	15		
20	15		
Total Marks Obtained:			
Remarks:			

16-B, 2nd Floor, Above National Trust Building, Bada Bazar Marg, Old Rajinder Nagar, Delhi-110060

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Delhi- 110009

EVALUATION INDICATORS

1. Contextual Competence
2. Content Competence
3. Language Competence
4. Introduction Competence
5. Structure - Presentation Competence
6. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

(Please do not write anything except the question number in this space)

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Answer Questions in NOT MORE THAN the Word Limit specified for each in the Parenthesis.
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(Specimen Answer Booklet - For Practice Purpose Only)

उम्मीदवारों को इस हाशिए में नहीं लिखना चाहिए
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1. While fixed-term employment offers an ingenious way to address specific issues faced by both employers and employees, there are also some concerns associated with it. Discuss in the context of India.

Q.1

"Fixed-term employment" refers to the concept of hiring an employee for a specified time period as determined in the contract prior to commencement of the service.

Advantages & Solutions to issues for Stakeholders

① It provides solutions to problems plaguing the employment sector.

Advantage to Employee

- ① Helps in easily procurement & continuous supply of labour
- ② Helps in maintaining good industrial relations by promoting industrial peace.

Advantage to Employers

- ① Provides steady flow of income during the job period
- ② Removes irregularities, "Hire

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and fire concept of Employment.

Challenges in the Fin term Employment

- ① Poor skill building among the employees.
- ② Poor social protection - no pension, employment fringe benefits, accident protection
- ③ Trade Union - Management conflict due to conflicting interests

Way forward

- ① The "labour codes" must provide protection to fin term employees.
- ② Reskilling fund must be set up.
- ③ Social security net must be expanded for fin term employees.

Fin term employment will help in the formation of economy.

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2. An efficient logistics sector with a focus on warehousing is pivotal to the success of the Bharatmala Pariyojana. Discuss.
(150 words) 10

(2)

The World Bank estimates the logistic sector is valued at \$215 billion.

Logistic sector - Warehousing component

① The Bharatmala Pariyojana aims to synergise the multi-modal min in India, by, attaining Total Quality Management and Business Process Reengineering

② Warehousing will play a pivotal role to attain success, by, ensuring adequate supply of goods at proper time & place.

③ Currently, the Central Warehousing Corporation and State Warehousing Corporation

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are involved in providing warehousing facilities

Issues plaguing warehousing sector

- ① Poor inventory management system - non adherence to FIFO principle.
- ② Poor- unscientific storage system / leading to perishability of goods
- ③ Lack of ICT connectivity raising concerns with corruption & leakages.

Way forward

- ① Aadhar seeding and ^{negotiable} electronic, warehousing receipts to catalyse ICT reforms.
- ② Scientific storage, record maintenance will help in attaining efficiencies.

Warehousing will transform the logistic sector and help succeed the Bharatmala Yojana.

3. What do you understand by the term 'irrigation scheduling'?
Bringing out the advantages provided by it, discuss the difficulties faced in applying it on a farm level.

③ Irrigation scheduling is preparing the timeline for providing irrigation to the farm based on scientific determination of the soil moisture availability, the prevailing weather conditions and, the available water resources

The Advantages of Irrigation Scheduling

- ① It helps in maintaining water-moisture content, preventing root-rot due to overwatering, or, shrivelling of crops due to underwatering.
- ② It helps provide more fertilizer delivery, based on scientific study.

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③ It helps maintain the ground water table and surface water levels.

④ It prevents leaching of soil minerals.

Difficulties in farm level

① Most of the farm holdings are small in size (less than 1.54 ha as the NAS study); ~~less~~

② Lack of awareness, financial capacity among the already impoverished farmers.

③ Subsistence style of farming in India which is dependent on monsoon.

Way forward

① "Irrigation scheduling" must be made part of "PM Kisan Sinchayee Yojana".

② The concept of "More Crop per drop" must be popularised among farmers.

Irrigation scheduling will help the farmers double their income as suggested by Ashok Dalwai Committee.

4. While the Pradhan Mantri Fasal Bima Yojana was touted as the largest crop insurance scheme globally in terms of farmer participation, various concerns have arisen since its implementation. Discuss.

(4)

The PM Fasal Bima Yojana was launched with the mandate of providing crop insurance to the farmers.

Recently, it was highlighted that less than 25% of the farmers availed the scheme.

PM - Fasal Bima Yojana - The largest Crop Insurance

① It covered both Kharif, Rabi and multiple agricultural season crops.

② Provided "National Crop Insurance portal" for online registration.

③ It provided coverage for both pre-harvest and post-harvest facilities.

Concerns with the scheme

① Delay in fund/Claim Settlement

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- ② Lackdaisal approach of the state governments in implementing the scheme.
- ③ Limited participation of the private sector insurance companies.
- ④ Regional disparity in the fund scheme - Maximum coverage in Punjab and Haryana only.
- ⑤ Low level of awareness among the sharecroppers.

Way forward

- ① PM Fasal Bima Yojana funds must come under ambit of priority lending sector.
- ② Insurance companies should make) utilise the funds under Corporate Social Responsibility.
- ③ States should adopt proactive implementation by target setting & performance appraisal.

PM Fasal Bima Yojana will help the Indian farmers get sustainable flow of income.

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5. The Stockholm Conference commenced the contemporary "environmental era", which brought a paradigm shift in the environmental governance and set a tone for multi-lateral environmental regime. Discuss.

5

Re The Stockholm Conference, 1972, recently celebrated its Golden Jubilee with the theme "A healthy planet for the prosperity of all".

Stockholm Conference — "Environmental Era"

① Revolutionized and brought into forefront environmental actions by establishing the UNEP.

② Stockholm Conference led to establishment of environmental ministries across the countries.

③ Stockholm Convention, 1972 has 122 member participants, and, they passed 26 resolutions together.

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④ It led to emergence of the concept of "polluter pay principle".

⑤ Was the bedrock for numerous other initiatives like the Rio Convention, UNCCD, UNFCCC, CBD and so on.

⑥ Stockholm Convention introduced concept of multi-stakeholder approach by allowing NGOs, civil society groups, voluntary organisations to participate in it.

Way forward] & the path ahead

① Stockholm +50 should focus on helping countries achieve the INDC targets of Paris agreement.

② Stockholm +50 should strive towards global collaboration in environmental conservation and protection.

Stockholm Convention was a milestone moment in environment protection.

6. The world has witnessed a huge surge in climate-induced disasters, which are largely driven by anthropogenic factors. In this context, analyse the role of early warning systems in mitigating the impact of the disasters.

6

Recent disasters like "Chamoli Dam breach", "Pakistan flood", "China mega drought" have, brought into the forefront, "Climate-induced disasters" and, their grave consequences on human lives.

Climate-Induced disasters - Role of Anthropogenic

① The organisation "Germanwatch", via its, Global Climate Change Risk Index, has, highlighted, that, the risk and hazard due to incessant greenhouse emissions, rampant - reckless mining, has increased exponentially.

② The 6th IPCC report, has, also highlighted that human activities have left permanent scars in the Earth which, lead to impending disasters

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Early warning Systems - Impact on disasters

① Early warning systems help warn the population about approaching disasters, and, helps in Evacuation to safe places.

② Early warning systems also help the government to anticipate the risk of the approaching disaster, and, the preparation to be made in the regard of disaster administration.

③ Cyclone Early warning system, Tsunami, Early warning system by the NDMA has helped saved millions of life lives in disasters like Cyclone Hudhud, Fani, dila.

Way forward

① The ~~upst~~ Early warning systems must be revamped to provide state of the art facilities.

② NavIC must be provided in all disaster prone areas

Early warning systems will help in mitigating the Anthropogenic & induced disasters.

7. Critically examine the implications of leveraging technology in policing.

7

The Mahimath Committee had recommended the use of technology to revamp the policing in India.

Policing in India - Need for Technology

① Policing in India, are, still having colonial mindset, technology will help them usher in new age service delivery.

② Technology will help in better surveillance, crime detection and catching criminals. eg: Facial Recognition Techniques used in, as, suggested in Halder Case.

③ Technology will help in better co-ordination among departments and inter-state police coordination. eg:

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Satellite based communication system will help in seamless connectivity -

④ Technology will help in better record maintenance, such as, Crime records, FIRs filed, data of known criminals. eg. NATGRID can be used by multiple agencies to get information -

⑤ Technology can be used to better train the police personnels to manage crowd, non-criminals & investigate crimes.

Way forward

① 2nd ARC report on public order recommendations like - reforming police HR policies must be made.

② Technology intervention by ICT must be implemented.

Police reforms as per Parkash Singh Case will help transform the institution to a "people-centric" approach.

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8. How far do you agree with the view that climate change poses a threat to international peace and security?

⑧

The 6th IPCC report on Climate Change has highlighted, that, human induced climate change will lead to future conflicts & geo-political tensions.

Climate Change - threat to International Peace

- ① States will disappear, due to rising sea levels - Maldives, Fiji risk getting submerged.
- ② Coastal erosion, rising levels, will, submerge cities like Mumbai, Miami etc.
- ③ Rural Indigenous people, women & children are most at risk, due to, human induced climate change disasters.

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4) These will lead to "statelessness" and "Climate Change Refugees"

5) Climate Change will lead to opening of Arctic Shipping lanes, discovery of Arctic oils and mineral resources will lead to disputes across nations.

6) Antarctica is already home to numerous territorial disputes between UK, Argentina, China etc. Climate Change and melting of ice sheets will heighten these conflicts.

7) Climate change will lead to food scarcity, water shortages leading to disruptions in global trade and supply chains.

Wayforward

① Focus on international collaboration, via, Paris Peace agreement must be made.

② Nansen principles, New York declaration for Climate change refugees to be adopted.

Climate Change must be reversed to protect the human race from perils.

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9. What do you understand by a virtual private network (VPN)? Highlight its advantages and discuss the concerns posed by it.

9. "Virtual private networks" are softwares that "encrypt" and "mask" the IP address of the computer system, to help bypass the country laws.

Recently, the Indian government asked VPN companies to maintain logs of all requests made to it.

Advantages of VPN net connectivity

- ① It helps protect the identity of the user from excessive-unjustified surveillance by the states.
- ② It helps establish the "right to privacy" as under Article 21 of the Constitution, and, the Puttaswamy judgement.

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③ It helps ex journalist, government activists bypass the oppressive regimes of dictators. eg: North Korean journalist use VPN to access free and fair internet.

Concerns of VPN Connectivity

① It can be used to access dark web and trade in illegal arms, drugs etc.

② It harms the e-commerce websites, by bypassing the rules of trades.

③ As the bandwidth of the internet infrastructure is limited, VPN put additional stress on the system.

④ VPN is used for money laundering and terrorist financing.

Wayforward

① VPN must be regulated by gov government.

② Free & fair use of internet must also be ensured.

VPN possess the ability to act as "double edged sword" in the internet infrastructure.

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10. The discovery of the Higgs Boson at the Large Hadron Collider in CERN completed 10 years recently. In this context, discuss the role played by CERN in overall scientific development.

10

CERN is astrophysics promotion organisation based in the France - Switzerland borders. India is an associate member of CERN.

Role played by CERN in scientific development

① "Large hadron Collider" led to discovery of the "Higgs-Boson" which is a subatomic particle. This helped in understanding the formation of the Earth.

② CERN is also involved in funding numerous other scientific studies in its organisation, such as, effect of gravitational waves on subatomic particles, impact on blackholes in destruction of

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atoms. These research, will, help understand the working of the universe.

③ CERN played crucial role in development of the "World Wide Web"

④ It possess huge data of scientific simulations related to subatomic particles, space study and astro-physics which can be utilised to develop further studies.

CERN is a leading organization to promote scientific discovery and study of the working of the Universe and the formation of Earth.

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11. Highlighting the factors that affect the cropping pattern in India, discuss the need for modifying it in the context of the emerging agro-ecological concerns.

11.

The Economic Survey, 2021-22, suggests that Indian agriculture contribute roughly 20% to GVA of India, and, the cropping pattern helps in determining annual contribution.

Factors determining cropping pattern

① Climatic conditions — Rainfall, annual temperature, moisture determine the crop to grow. eg: Rice is grown in such rainfall areas.

② Soil conditions : — Alluvial soil, black soil etc → Wheat is grown in loamy soil, whereas, millets grow in coarse soil.

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③ Water Availability : The amount of water available via monsoon / irrigation also determines cropping pattern.

④ Availability of inputs - like seeds, fertilisers, mechanisation, also determines leads to determination of cropping pattern.

⑤ Government support like MSP, institutional credit eg: Predominance of Rice & Wheat in India due to government support in procurement of cereals.

Need to modify the cropping pattern

① Climate change needs to be addressed via crop diversification.

② Impetus to nutritional security and food security, by growing millets.

③ Protection of soil nutrients and water levels by growing pulses and

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leguminous crop.

(4) Cropping pattern must be changed to induce environment friendly methods like Zero-based natural farming, agro-forestry.

Way forward 1

- ① National mission on Climate Smart agriculture must be promoted
- ② National mission on Crop diversification must be given further impetus.
- ③ Government intervention via, reforms like MSP Signalling must be made.
- ④ Farmers should avail schemes like "Soil health Card" & "KH-Paramparagat Krishi Yojana"

Crop pattern modification will help in growth of Indian farmers, as, suggested in the National Assessment Survey.

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12. While the budgetary reforms undertaken by the Central government in recent years have led to better management of government expenditure, there are some issues that still need redressal. Discuss.

12

The rising ^{fiscal} deficit in India, has led to, calls for better management of government expenditure. As per the Economic Survey 2021-22, the gross fiscal deficit was, at 46.1% of the budget estimates.

Budgetary Reforms to better management of expenditure

① The government has launched its new procurement rules, which, focused on:

- (a) Timely payment of dues to vendors
- (b) Selection based on best quality and lowest cost methodology.
- (c) Establishment of grievance redressal mechanism for solving concerns.

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(2) The government also launched the "e-Marketplace" for procurement by the government ministries and departments. It has made it mandatory to procure ~~for~~ from the gem.

(3) Reforms have being made in the "General Financial Rules" to reform government expenditure.

(4) Rationalization of government schemes by reducing it from 66 to 28 and, establishing 6 "Core of the core" schemes.

Issues that need redressal

① Railways and the armed forces continue to have their own procurement policies.

② Non-adherence to the procurement policies, due to, opaqueness in government tender filing — concerns regarding negotiations.

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③ Wasteful revenue expenditure in government departments and wasteful offices, as highlighted by CAG.

④ Non Implementation of electronic public finance information system, leads, to concern of leakages.

Wayforward

① Reforms in public procurement to mandatory allow " Swiss Challenge method " in all expenditures.

② Implement of ~~electro~~ ICT enabled - public finance ~~inf~~ management system.
eg: deas Public finance management system should serve as role model.

③ Rationalization of grants-in-aids, tied up funds as suggested by 15th finance commission.

• Government expenditure rationalization will help achieve \$5 trillion economy.

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13. For India to create a 'future ready' railway system, it must harness innovation and resource efficiency. Discuss the

statement in the context of the measures enlisted in the National Rail Plan 2030.

13

The Rakesh Mohan Committee has called for reforms in railway system to make it "future ready".

Need to harness innovation & resource efficiency

- ① Very high operating costs (circa 98%) - leads to dwindling revenue streams
- ② Need to rationalize fares for both passengers & freight to increase efficiency in the operations.
- ③ Innovations in rail infrastructure eg. Vista dome coaches, Vande Bharat trains to revolutionize the railway experience.
- ④ Currently, Indian Railways handle 1.5 billion tonnes of freight annually as per Economic Survey-2021-22

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④ Innovation is also required in the management and HR policies of the Indian railways by restructuring the railway board, Indian Railways Management Service.

⑤ Innovation in railway tracks, railway routes via Dedicated freight corridors will make railway future ready.

⑥ State-of-the-art railway stations, customer facilities - sanitation will help transform railway system.

National Rail Plan - 2030

① It aims to usher in new age service delivery by catalysing synergies across railway

② Aims to increase the modal share of the railways

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③ Reducing transit time of freight, by, increasing speed of freight trains to 50kmph

④ Focusing on 100% electrification of the routes.

⑤ Decongestion of crucial lines like Delhi-Hanah, Delhi-Mumbai lines

⑥ Identification of new dedicated freight corridors and high speed rail corridors.

⑦ Increasing private sector participation via PPP model.

Wayforward

① Recommendations of Bilek Delroy committee like increasing capacity handling infrastructure of railway to be adopted.

② International best practices like Amtrak Train (USA) must be implemented

Railway reforms will help usher in "Atmanirbhar Bharat".

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14. Discuss the significance of technology in the Indian agricultural sector. Also, state the challenges in realising its potential to improve agricultural efficiency and increase the income of the farmers.

The Ashok Dalwai Committee has called for use of technology to double farmers income.

Significance of Technology in Indian Agriculture

① It is useful in predicting weather and climatic conditions, for, crop sowing, fertilizer spraying. eg: IMD satellites help in weather bulletin for farmer.

② It helps in providing market for selling the agricultural produce. eg: e-NAM, ^{eAPMC, e-choupal/kyITC} serves as mandi for the farmers.

③ Kisan Call centers launched by govt. helps in providing advice to the farmers.

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- 4) e-gMarknet helps in standardisation, grading of agricultural produce
- 5) Bhuvan platform of ISRO helps in understanding the soil of the farms
- 6) Drones are being used for aerial delivery of fertilisers, pesticides etc.
- 7) ICRISAT, ICAR are using technology to develop HYV seeds, nano urea, farm mechanising tools.
- 8) IFFCO Net serves as online website for buying agricultural inputs.

Challenges in utilising technology

- 1) Lack of literacy among farmers.
around 38% of rural people are digitally literate as per MeitY
- 2) Lack of financial resources to procure

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technologically advanced farm equipments

③ Lack of government support in providing subsidies, as well as, funds for research & development

④ limited role being played by private sector to bolster innovation

Wayforward

① Technology missions must be promoted to increase penetration in Indian farms.

② Private players must be encouraged via PPP models

③ ICRISAT & ICAR must be revamped to promote new age innovation.

Adoption of technology in farming will fulfil food security in India as well as, improve socio-economic conditions of farmers.

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15. Despite the digital transformation in the Public Distribution System (PDS) in India, several challenges still remain. Elaborate. Also, suggest measures to address them. (250 words)

15. The Ministry of food and public distribution has lately ~~be~~ made aadhaar seeding of Ration Cards and setting of e-point of sales in all fair price shops as mandatory.

Digital transformation in PDS

① ~~Dharm~~ Partha Mukhopadhyay committee had recommended implementation of ICT in the pds system of India.

② GPS tagging, electronic record maintenance would ensure tracking and prevent leakages in the system.

③ Biometrics enabled ration card would ensure targeted beneficiaries availing the facilities of the welfare scheme.

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Challenges in PDS system

- ① Lack of digital standardisation, grading of the food & cereals.
- ② Lack of effective inventory management system. eg: non adherence to FIFO principle.
- ③ Diversion of cereals by corruption and leakages in the system.
- ④ "One nation-one ration card" is yet to be fully operational, leading to, concerns for inter-state migrants workers.
- ⑤ Huge wastage of food crops due to inefficient procurement & storage.
eg: ICAR suggests roughly 4-5% of total produce gets wasted annually.
- ⑥ PDS system is causing huge burden on the financial encumbrance due to high procurement prices and lower selling prices.

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Way forward for PDS reforms

① Shanta Kumar Committee reports' recommendations like compulsory linking of PDS shops with online trading system must be done

② "One nation - one ration" card must be made operational. The ration cards must be biometric enabled to ensure targeted beneficiary identification

③ Focus on digital interventions like drones to monitor procurement and storage must be made.

④ National policy on food procurement must be revamped, to, allow private sector participation

Digital Transformation in PDS in India will ensure fulfilment of SDG-2 (Zero hunger) and SDG-10 (Reduced Inequality)

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16. Discuss the various concerns that exist with regard to fuel efficiency regulations for vehicles in India. Also, suggest the measures that can be taken in this regard.

16) The World Resource Initiative and Niti Aayog have recently launched policy to decarbonise the ~~car~~ transport in India and improve fuel efficiency in India.

Concerns that exist to fuel efficiency regulations

① The Bharat Norms-6, which was launched is below standards of the EU norms and the USA guidelines.

② Existence of old vehicles which run on diesels plague the fuel efficiency regulations. These vehicles have internal combustible engines which release toxic fumes into the atmosphere.

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③ Lack of effective phasing-out rules of old vehicles in the government, as well as, private sector. eg. The policy for phasing out old vehicles was introduced recently, but, its implementation isn't being enforced.

④ Ethanol blending ^{at 20%} is being preponed to 2025. However, it requires retrofitting of E20 engines.

⑤ Use of methanol (~~dimethyl ether~~), as, substitute of diesel, is, ~~being~~ still under regulation, as, it is found to be corrosive in nature.

⑥ Biofuels, require, fuel efficiency regulations which is still not developed as per National policy on biofuels.

⑦ Concerns regarding safety of electric vehicles is, raising, inefficiency in the Transport sector.

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Wayforward

- ① Govt should ensure strict implementation of phasing out of old vehicles. Eg- Scrap the 15 year diesel engine car
- ② Reforms in Ethanol blending. to make it compliant with the Bharat-6 standards.
- ③ Electric vehicles must be ensured to be fire resilient and efficient in resource utilisation.
- ④ Niti aayog must ensure success of the forum for decarbonising the full transport sector.
- ⑤ Smart cities must promote public-transport facilities for residents.
- Fuel efficiency regulations will help India achieve its INDC goals and fulfil commitment to Paris agreement.

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17. Urban fire is becoming a serious cause of concern in Indian cities. In this context, highlight the major causes behind urban fires in India. What steps can be taken to build robust fire resilience in Indian cities?

17 Cases like fire in Coaching institute of Surat, Urban slums of Dharavi, and fire in AMRI hospital Kolkata, have, highlighted the threat of Urban fires in India.

Major Causes of Urban fires in India

① Poor Urban Planning

(A) Non adherence of National building Code norms by new constructions

(B) Poor scope of fire resilient structures already existing.

(C) Lack of fire safety / fire fighting tools in apartment complexes.

② Poor resources, skills, and, capability among the fire fighters, due, to poor training and financial constraints

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③ Increase in combustible materials in and around the urban homes — elect faulty electrical lines, combustible construction materials like wood furnitures and soon.

Steps to build robust fire resilience

- ① New buildings must adhere to the National Building Codes set up by BEE.
- ② Existing buildings must be retrofitted with fire fighting tools, like, fire extinguishers, fire exits and water storage tanks.
- ③ Article 243 mandates Urban Local bodies to fight against urban fires. ULBs must strengthen capacity to reduce risk and hazard of fire in urban spaces.
- ④ The fire fighters must be skilled and trained to handle vulnerable situations.

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Modern equipments, like state-of-the-art fire engines must be supplied.

⑤ The Ministry of Urban affairs ^{must} ~~has~~ come up with a comprehensive SOP to ensure resilience to Urban fires.

⑥ State government must co-ordinate with NDMA to build vulnerability mapping of high risk areas and conduct safety drills in schools, hospitals and places of agglomeration.

Urban fires represent 'hazard' to the safety of the people. Building risk resilience will help achieve SDG-11 (Sustainable Cities)

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18. Drones in border areas present a serious threat for border management in India. Elaborate. Also, discuss the different measures taken to regulate the use of drones in India.

18.

The Recent interception of drones across the Punjab border and the LOC, have, highlighted the serious threat for border management.

Drones - A Safety risk

- ① Drones are being used to Transport drugs, narcotics across the border from Pakistan.
- ② Drones are being used to supply weapons, arms to militants in Kashmir.
- ③ Drones are being utilised to survey Indian outposts, military stations, army formations and movements by enemy countries.

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(4) Unmanned aerial vehicles ^{can be} ~~are being~~ utilised to launch attacks on the military and civil population alike.

eg: Drones used to conduct assassination attempt on Venezuelan President Chavez

(5) Drones, ~~are~~, may come in path of Indian army helicopters, aircrafts which may lead to crashes and death of personnels.

Measures taken by India

(1) India ~~has~~ classified "drones" as unmanned aerial vehicles based on weight and size to determine its risk.

(2) Ministry of civil aviation has come out with Drone regulations, which, determine the rules to acquire & fly drones.

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③ Indian armed forces has set up no-fly zones across sensitive areas like airports, military bases, headquarters.

④ DRDO is developing anti-drone systems to engage and destroy anti drones.

⑤ Indian Navy has acquired sea guardians from USA to monitor drones.

Way forward

① Indian armed forces must develop indigenous drone technologies for mitigating risk and vulnerability.

② Cross border engagement talks to prevent non-state actors from misusing drone technology.

③ Lyedhole committee recommendations which suggests using technologies like BOLD-QIT for border management to be implemented.

Drones in border areas must be managed to ensure internal security of India.

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19. Despite a global framework to prevent weaponization of space, it has been increasing in the recent times. Discuss. Also, give an account of the implications of space weaponization.

19 The "Peaceful Use of Outer Space Treaty" bans use of space for military purposes.

Weaponization of Space - Recent Times

- ① The United Nations calls on the use of Space i.e. "common goods" for peaceful use only such as, scientific usage, exploration.
- ② However, countries like USA, Russia, China and India are launching and developing weapons to militarize the space frontier.
- ③ USA launched the "Space force" under Donald Trump presidency, as, an additional wing of its armed forces.

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④ India conducted Mission Shakti — a capability to destroy enemy satellites using kinetic kill technology.

⑤ Withdrawal of USA and Russia from Open Skies Treaty, means, increase in space militancy.

Implications of weaponization of Space

① It will lead to a maddening arms race, as observed previously in the cold war era, leading, to increased scope for geo-political tensions.

② Destruction of space satellites will lead to "Kessler Syndrome" — a phenomena where, we will get trapped in the Earth due to enormous space debris.

③ Nuclear explosions in space and on the moon will have far-reaching impact, leading, to solar storms.

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heightened nuclear radiation and ~~so~~ lead to a nuclear winter.

④ Weaponization of space will have negative impact on scientific discovery and exploration, as, collaboration across countries will take a hit. Eg. Russia has already announced building its own space station.

Way forward

① International community, must, prevent militarization of the space. India can, play role of "Vishwa Gurus" to lead this.

② "Peaceful use of Outer Space Treaty" must be made legally binding for all countries.

③ Nasa, ISRO, ESA must play role of facilitator.

Peaceful use of space will help in advancement of human race and civilization

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20. What do you understand by a bio-economy? Highlight the role that the National Biotechnology Development Strategy 2021-2025 can play in creating a robust bio-economy in India

20. "Bioeconomy" is the utilisation of biological resources and bioprocess to develop sustainable & products like Biofuels, Biotentiles, Biofertilizers, Biopharmaceuticals and soon.

Recently, BIRAC launched the National Biotechnology Development Strategy 2021-25 to create robust bio-economy.

Bio-Economy in India

① Multisectoral Involvement to improve resource utilization and productivity

① Farming: Genetically engineered seeds, Bio-fertilizers and pesticides

② Medicines: Bio Medicines, Bio Syringe

③ Environment Sustainability: BioPlastic, Biotentiles, Bio-energy

Q) India's ~~eco~~ bioeconomy is likely to touch USD 150 billion by 2026.

National Biotechnology Development Strategy 2021-25

- ① It aims to increase scientific research & development in sectors across primary, secondary and tertiary industry.
- ② Schemes like SITARE, to propel, research and help scientists in funding.
- ③ It aims to bridge regional disparities especially, in North East India.
- ④ The strategy has a focus to make India sufficient in GEM crops and become a net exporter in biotechnology.

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⑤ Special thrust on innovation of 2nd & 3rd generation Bio-ethanol has been made in the strategy.

⑥ Aims to resolve ethical and safety concerns with regards to biotechnology, like, concerns regarding cellular dystrophy

⑦ The strategy aims to create proactive platform for collaboration with private sector for advancing scientific research.

Wayforward

① Biotechnology in India must be promoted, by making it more accessible to the poor farmers.

② Strict adherence of international conventions like Carthagna protocol must be implemented

③ PPP model for collaboration to be developed

④ BIRAC to be revamped to ensure more autonomy and financial capability.

Bioeconomy will help India achieve the goal of \$5 trillion economy.