

GS PAPER2- GOVERNANCE-GOVERNMENT POLICIES AND INTERVENTIONS FOR DEVELOPMENT IN VARIOUS SECTORS AND ISSUES ARISING OUT OF THEIR DESIGN AND IMPLEMENTATION.**New rules for police officers under the Bharatiya Nagarik Suraksha Sanhita (BNSS)**

The article explains new criminal laws effective from July 1. It details rules for FIR registration, mandatory videography during searches, provisions for arrest, timelines for investigations, and the responsibilities of police officers under the Bharatiya Nagarik Suraksha Sanhita (BNSS).

What are the new rules for police officers under the Bharatiya Nagarik Suraksha Sanhita (BNSS)?

1. **Zero FIR Registration:** Police officers must register an FIR regardless of jurisdiction issues under Section 173 of the BNSS. This ensures that no complaint is turned away due to territorial concerns. If the incident occurred outside their jurisdiction, they are required to transfer the FIR to the appropriate station.
2. **Electronic Submission:** FIRs can now be filed electronically through platforms like the CCTNS portal, police websites, or official email addresses. This must be signed by the complainant within three days to be officially recorded.
3. **Mandatory Videography:** Sections 185, 176, and 105 of the BNSS mandate videography for searches, crime scenes, and seizures. This is to preserve evidence integrity and support transparent proceedings. Officers are equipped with electronic devices for this purpose, using apps like 'eSakshya' which tags and timestamps images and videos.
4. **Display of Arrest Information:** Information about arrested individuals must be displayed at police stations as per Section 37. This includes names, addresses, and details of the alleged offences, enhancing transparency.
5. **Restrictions on Arrests:** Under Section 35(7), elderly or infirm individuals cannot be arrested for offenses punishable by less than three years without permission from an officer of Deputy Superintendent rank or higher.
6. **Timelines and Reporting:** The medical report in a rape case must be submitted within seven days. POCSO case investigations must finish in two months. Police must update the informant or victim about investigation progress within 90 days.
7. **Special Provisions for Electronic Evidence:** There is a focus on maintaining a chain of custody for electronic evidence to prevent tampering, emphasizing the role of cyber experts in safeguarding digital data.
8. **Defining a Terrorist Act:** A new rule under Section 113 defines 'terrorist acts' and assigns the duty to officers of SP rank or higher to decide on registering such cases, considering several factors like the severity of the threat and the level of investigation needed.

GS PAPER2-GOVERNANCE- ISSUES RELATING TO DEVELOPMENT AND MANAGEMENT OF SOCIAL SECTOR/SERVICES RELATING TO HEALTH.**Controversy Around HPV Vaccination**

The article discusses the promotion, timing, and high cost of India's HPV vaccine, Cervavac. It questions the need for universal vaccination against HPV, highlights delay in development due to patent issues, and criticizes the high price despite potential for lower costs.

What is the HPV Vaccine?

1. The HPV vaccine is designed to prevent cervical cancer by targeting the human papillomavirus (HPV).
2. Only a few out of over 200 HPV strains are linked to cervical cancer, specifically causing precancerous lesions.
3. Despite the vaccine's aim, most individuals with HPV do not develop cancer; infection is common, but progression to cancer is rare.
4. India's Serum Institute developed Cervavac, an indigenous HPV vaccine, using recombinant DNA (rDNA) technology, similar to early vaccines like the Hepatitis-B vaccine. The vaccine targets pre-puberty girls, based on the assumption that preventing HPV transmission at a young age will reduce cancer rates later.

How Have Patents Affected Vaccine Development?

1. Patents have shifted vaccine development from public to private sectors, changing the landscape of innovation.
2. The U.S. Patent Act amendments in the 1980s allowed for the patenting of genetically modified organisms and life processes, facilitating private monopolization of vaccine development.
3. The TRIPS agreement globalized U.S. patent laws, impacting vaccine production and distribution worldwide.
4. This resulted in delayed availability of vaccines like India's Cervavac, which had to wait for key HPV vaccine patents to expire before development could begin.
5. Patented vaccines such as Gardasil and Cervarix were developed under these new conditions, setting precedents in vaccine commercialization.

What Impact Has This Had on India's Vaccine Industry?

1. India's 1970 Patent Act fostered the growth of its domestic vaccine industry by allowing only process patents, not product patents.
2. This enabled rapid development and production of generic drugs and vaccines, positioning India as a global pharmacy.
3. The introduction of product patents under TRIPS slowed down the development of new vaccines like Cervavac, which took two decades after similar vaccines were available globally.
4. Despite infrastructure capable of producing at scale, Cervavac's market pricing remains high, raising concerns about the application of patent laws and their impact on affordability and accessibility in India's vaccine market.

What is the Controversy Around HPV Vaccination in India?

1. **Association with Cancer:** The link between HPV and cervical cancer is controversial. While certain strains of HPV are associated with precancerous lesions, most HPV carriers do not develop cervical cancer.
2. **Moral and Cultural Concerns:** The push to vaccinate pre-puberty girls based on assumptions about their future sexual behavior is seen as problematic. This perspective is viewed as imposing Western values and may be considered a moral issue within the conservative fabric of Indian society.
3. **Gender Bias:** The focus on vaccinating girls and not boys highlight a gender bias, overlooking the fact that men can also be carriers of HPV.
4. **Cost Issues:** The high cost of the HPV vaccine poses a significant barrier. The government price is ₹500 for two doses, but for those not covered by government programs (recommends Cervavac for girls aged nine to 26), the retail price escalates to ₹2,000, making it unaffordable for many.

GS PAPER-2- GOVERNMENT POLICIES AND INTERVENTIONS FOR DEVELOPMENT IN VARIOUS SECTORS AND ISSUES ARISING OUT OF THEIR DESIGN AND IMPLEMENTATION.

New Labelling Regulations for Packaged Food

This article discusses the recent amendment to food labelling regulations by the Food Safety and Standards Authority of India (FSSAI). The amendment intends to improve consumer awareness and public health.

India’s urban growth is boosting consumption of packaged foods, especially among children. By 2030, India could have over 27 million obese children, making up 10% of the global total, as per UNICEF’s “World Obesity Atlas” (2022).

What are the recent amendments brought by FSSAI?

The FSSAI approved changes to the Food Safety and Standards (Labelling and Display) Regulations, 2020. Packaged foods will now show salt, total sugar, and saturated fat details in a bold and larger font. Previously, this information was in small fonts which could have been easily overlooked by consumers.

What is the significance of new regulation?

- 1) **Empowerment**-It will empower the consumers to make informed decisions.
- 2) **Enhancing Public Health** -The proposed changes to food regulations will enhance public health, combatting non-communicable diseases.
- 3) **Export-based Employment**-The portion of processed food in total agricultural exports almost doubled from 2014-15 to 2022-23, reaching around 26%. Adopting global food regulations will create more opportunities for growth and export-based employment.

What are the challenges in food safety regulation in India?

- 1) Simply showing nutritional information in big fonts isn’t enough if consumers don’t understand its importance or the health risks it signals.
- 2) Harmful substances in popular Indian spice brands and extra sugar in baby food were detected through testing done abroad by a foreign NGO.

What should be the way forward?

- 1) Raising public awareness about recommended dietary allowances and their connection to saturated fat, sodium, and sugar is essential.
- 2) Public health departments at both the central and state levels should conduct awareness campaigns to educate the public.
- 3) There is a need to encourage better food choices that can alleviate strain on healthcare systems.
- 4) The food regulator must set clear standards and ensure all food companies follow them to keep consumers safe and maintain trust.

GS PAPER3- ECONOMY -EMPLOYMENT

India’s urgent need for good-quality jobs

The article discusses India’s urgent need for good-quality jobs. It highlights joblessness as a key issue, despite economic growth. The article suggests various policies, including vocational training, wage subsidies, technical assistance for enterprises, and basic income supplements for the poor.

Why is joblessness a critical issue in India?

1. **Persistent Problem Across Decades:** Joblessness has been a consistent issue in India, not adequately addressed by successive governments, indicating its deep-rooted nature in the economy.
2. **Election Concerns:** Recent elections highlighted joblessness as a critical issue, affecting voter decisions and showing public dissatisfaction with existing job policies.
3. **Economic Growth Disparity:** Despite economic growth, employment has not kept pace. National surveys over 50 years confirm that job creation lags behind economic expansion, highlighting the failure to convert economic gains into employment opportunities.
4. **Social Stability Risk:** If unaddressed, the growing joblessness is potentially socially explosive, demanding immediate and focused policy intervention.

What are the issues with previous employment policies?

1. **Delayed Payments and Shortcomings:** There are notable delays in wage payments. Additionally, despite the law stipulating 100 days of work per household, many receive much less, undermining the effectiveness of the scheme.

2. **Conditions of Manual Labor:** The jobs provided are manual and performed in harsh conditions, such as under a scorching sun, making them less appealing and barely sustainable for workers.
3. **Unmet Legal Guarantees:** Workers rarely receive unemployment benefits when a job is not provided within 15 days, a failure to comply with the legal provisions of the schemes.

How can sustainable jobs be created in India?

1. **Vocational Education and Training:** Launch mass-scale vocational programs with business apprenticeships to improve employability, learning from models like Germany's vocational system and the California community college system.
2. **Adjusting Subsidies:** Evaluate existing capital subsidies that currently encourage labor-replacing, capital-intensive investments. Replace some of these subsidies with wage subsidies that encourage firms to create regular jobs.
3. **Support for Non-Farm Enterprises:** Extend technical assistance and management training to non-farm household enterprises, drawing lessons from the software aid provided to ASHA workers in Uttar Pradesh.
4. **Addressing Demand Deficiency:** Address income inequality to boost consumer demand by raising incomes of lower economic sections through a basic income supplement, enabling them to participate more in the economy and potentially seek better jobs.

Tax Reforms: Fund these initiatives by reducing subsidies for the affluent and increasing taxation on the wealthy, including inheritance and wealth taxes.

PRELIM FACT

1. Centre to Revise Classical Language Status Criteria

The Union government plans to revise the criteria for granting classical language status.

Current criteria for Declaring a Language as Classical

- i) **Antiquity:** The language must have early texts or recorded history spanning 1500-2000 years.
- ii) **Literary Heritage:** The language should have a body of ancient literature or texts considered valuable heritage by generations of speakers.
- iii) **Original Literary Tradition:** The literary tradition should be original and not borrowed from another speech community.
- iv) **Distinctiveness:** The classical language and its literature should be distinct from the modern form, and there may be a discontinuity between the classical language and its later forms or offshoots.

Languages with Classical Status: Tamil declared in 2004, Sanskrit declared in 2005, Kannada declared in 2008, Telugu declared in 2008, Malayalam declared in 2013 and Odia declared in 2014.

Benefits of Classical Language Status

- i) **Awards:** Two major annual international awards for scholars of eminence in classical Indian languages.
- ii) **Centres of Excellence:** Establishment of a Centre of Excellence for studies in Classical Languages.
- iii) **Academic Support:** The University Grants Commission is requested to create a certain number of Professional Chairs for the Classical Languages, at least in the Central Universities.

2. Discovery of the World's Oldest Cave Painting

Recently, researchers have found the cave painting in Indonesia which is the world's oldest known evidence of storytelling in art.

1. The world's oldest-known cave painting has been discovered in the limestone cave of Leang Karampuang, located in the Maros-Pangkep region of Sulawesi, Indonesia.
2. This artwork depicts three human-like figures interacting with a wild pig. The painting features a pig measuring 92 cm by 38 cm, painted in a single shade of dark red pigment. There are other images of pigs present in the cave.
3. The painting was created at least 51,200 years ago.
4. Researchers determined this age using a new scientific approach that involves using a laser to date calcium carbonate crystals that formed naturally on top of the painting.
5. The researchers interpret this artwork as a narrative scene, making it the oldest-known evidence of storytelling in art.

7. Significance:

- i) These paintings provide the oldest evidence of storytelling, a fundamental aspect of human culture and identity.
- ii) The depiction of a pig species that still inhabits Sulawesi links past and present wildlife on the island, highlighting the continuity of the natural environment over tens of thousands of years.

3. Anand Marriage Act

Recently, the National Commission for Minorities conducted a video conference meeting, chaired by the Chairman of the Commission, with representatives from 18 States and Union Territories. The purpose of the meeting was to discuss the implementation and registration of Sikh marriages under the Anand Marriage Act.

About Anand Marriage Act

1. The Anand Marriage Act was passed in 1909. It is a legal act in India specifically designed for the Sikh community.
2. This act was enacted to provide separate legal recognition for Sikh marriages, distinguishing them from Hindu marriages. Prior to this act, Sikh marriages were registered under the Hindu Marriage Act.
3. The Sikh community sought distinct recognition of their marriage rituals, particularly the Anand Karaj ceremony.

Key Features of the Anand Marriage Act

1. Legal Recognition of Sikh Marriages: The act officially recognizes Sikh marriage ceremonies, known as Anand Karaj, as a valid form of marriage.

2. Sikh Identity: The act was a step towards recognizing and legitimizing the distinct religious and cultural identity of the Sikh community in India.

3. Registration of Marriages: While the original 1909 act did not specifically provide for the registration of marriages, amendments and legal provisions over the years have facilitated the registration process for Sikh marriages under this act. This enhances legal clarity and security for couples.

4. Cultural and Religious Significance: The act acknowledges the importance of the Anand Karaj ceremony, which is central to Sikh matrimonial rituals and reflects the community's unique religious practices.

5. Significance and Evolution

i) The Anand Marriage Act was a landmark legislation for the Sikh community, affirming their distinct religious and cultural identity within the framework of Indian matrimonial laws.

ii) Over the years, there have been discussions and demands for amendments to the act, focusing on clearer legal provisions for issues such as divorce, alimony, and the registration process.

iii) These amendments aim to further align the act with contemporary legal standards while respecting Sikh traditions.

iv) **Recent Implementation:** In 2023, the Anand Marriage Act was implemented in Jammu & Kashmir, expanding its reach and ensuring that Sikh marriages in the region are recognized and registered under this act.

UPSC Syllabus: Polity and nation

4. Regenerative Braking

The regenerative braking device market is projected to experience significant growth between 2024 and 2031, driven by the increasing popularity of electric vehicles (e-vehicles).

Regenerative braking is a technology used in electric and hybrid vehicles to capture and reuse energy that would otherwise be lost during braking.

How Does Regenerative Braking Work?

1. Normal Braking: In traditional vehicles, braking converts the car's kinetic energy into heat, which is then wasted.

2. Regenerative Braking:

i) In vehicles with regenerative braking, pressing the brake pedal causes the electric motor to run in reverse. This reverse action slows down the car similarly to traditional brakes.

ii) Instead of converting kinetic energy into heat, the motor converts it back into electrical energy. The electrical energy is then stored in the vehicle's battery for later use.

3. Energy Conversion and Storage: The reversed motor converts the kinetic energy of the moving car into electrical energy. This electrical energy is sent back to the car's battery and stored for future use, such as powering the vehicle or running electrical systems.

Significance of Regenerative Braking

i) **Energy Efficiency:** Saves energy by reusing it, reducing the need for frequent battery recharges.

ii) **Extended Range:** Helps electric and hybrid vehicles travel further on a single charge.

iii) **Reduced Wear and Tear:** Reduces wear on traditional brake components, leading to lower maintenance costs.

Shortcomings of Regenerative Braking

i) **Incomplete Stopping Power:** Regenerative braking alone often cannot bring a vehicle to a complete stop and must be supplemented by conventional braking systems.

ii) **Hill Descent:** Regenerative brakes may not prevent vehicles from backsliding downhill.

iii) **Efficiency at Low Speeds:** The efficiency of energy recovery drops as the vehicle's speed decreases, though regenerative brakes are beneficial in stop-start traffic.

5. Vizhinjam International Port

The Adani Group's Vizhinjam Port is now ready to receive its first mothership.

About Vizhinjam International Port

1. Location: The port is located in Vizhinjam, a coastal town in the Thiruvananthapuram District of Kerala.

2. Developed by: It was developed under a landlord model with a Public Private Partnership component on a Design, Build, Finance, Operate, and Transfer (DBFOT) basis.

3. It was primarily designed to cater to container transshipment, the port also handles multi-purpose and break-bulk cargo.

4. It will also be a global bunkering hub, supplying clean, green fuels like hydrogen and ammonia.

5. After completion, the port will be one of the world's greenest ports in the world.

Strategic Advantage

i) The port is a mere 10 nautical miles (NM) diversion from the international east-west shipping route connecting Europe, the Persian Gulf, and the Far East.

ii) It is also close to the national and regional road and rail network.

iii) The port will feature approximately 30 berths, most of which will be capable of handling Mother Vessels.

Significance of the port

i) The port is the only transshipment hub in the Indian subcontinent, strategically located close to international shipping routes and centrally on the Indian coastline. Around 95% of India's foreign trade is conducted via the sea route, accounting for 70% of the trade in value terms.

ii) Nearly 30% of freight movement occurs through the international shipping route south of the Indian peninsula, passing just 10 NM off Vizhinjam.

ANSWER WRITING

Q. Discuss how basic duties of police officers have changed with the new criminal laws coming into effect.

Three new criminal laws—Bharatiya Nyaya Sanhita (BNS), Bharatiya Nagarik Suraksha Sanhita (BNSS), and Bharatiya Sakshya Adhinyam (BSA)—came into effect across India on July 1. These laws brought significant changes to the country's criminal justice system, replacing the colonial-era Indian Penal Code (1860), Code of Criminal Procedure (1973), and Indian Evidence Act (1872). Together, these three laws redefine penal offences, prescribe new processes for investigation and evidence gathering, and govern the trial process in court, fundamentally transforming India's criminal justice jurisprudence.

Changes in Basic Duties of Police Officers:

- **Rules for Registering FIRs:** The officer in-charge is now legally bound to register a **First Information Report (FIR) regardless of jurisdiction**, known as a **zero FIR** under the **Section 173** of the **Bharatiya Nagarik Suraksha Sanhita (BNSS)**. This can be done **electronically**, which is to be taken **on record** by the officer in-charge if it is signed within **three days** by the person giving it. **Non-registration of FIRs may attract penal action under various sections.**
- **Electronic Information Submission and Sensitive Enquiries:** While no one can stop a police officer from enquiring into the information immediately if it is of a sensitive nature, the **electronic mode** by which information may be given must be **decided by the agencies**, such as the Crime and Criminal Tracking Network and Systems (**CCTNS**) **portal**, the **police website** or **officially published email IDs**.
- **Videography Requirements:** The BNS mandates videography during **searches under Section 185, at crime scenes**, and when taking **possession of property**. This helps in maintaining **evidence integrity and transparency**, benefiting both the **investigation and judicial process**.
- **Public display of Arrest Information:** **Information about arrested persons boards (including in digital mode) containing names, addresses and the nature of the offence must be put up outside police stations and district control rooms.**
- **Provisions of Arrest:** **Section 37** of the **BNSS** requires a police officer in every police station, **not below the rank of Assistant Sub-Inspector**, to be responsible for **maintaining and prominently displaying information** about the arrested persons. **Restrictions** are placed on the **arrest of elderly or infirm individuals**, requiring permission from a **Deputy Superintendent of Police (DySP)** for arrests in minor offences. This ensures **humane treatment** of suspects and transparency in custodial processes.
- **Timelines for Medical Examination and Investigation:** Medical reports for rape victims must be forwarded to the **Investigating Officer (IO)** within **seven days under Section 184 (6) of the BNSS**, and **POCSO Act** cases must be investigated within **two months**. These timelines expedite the **judicial process** and ensure **timely justice** for victims.
- **Handling of Electronic Devices:** **Section 193(3)(h)** requires maintaining a **sequence of custody** for **electronic devices** and informing the investigation progress within **90 days** to the informant or victim. This emphasises the **integrity** and careful handling of **electronic evidence**, crucial in modern investigations.
- **Terrorist Acts:** **Section 113** defines 'terrorist act' and mandates that the decision to **register** such cases be made by an officer of **SP rank or higher**. This ensures that cases related to terrorism are handled with the necessary **expertise and scrutiny**.

Issues and Solutions:

- **Resource Limitations:** Many police stations may lack the necessary **technological resources** for **mandatory videography** and **handling electronic evidence**.
 - **Government funding and infrastructure development** to equip police stations with the required technology.
- **Training Needs:** Police officers may need adequate training to handle **new procedures and electronic devices**.
 - **Regular training programs and workshops** to enhance the skills of police officers in line with new laws.
- **Administrative Burden:** New rules may increase the administrative burden on police officers, affecting their efficiency.
 - **Streamlining** procedures and recruiting **additional administrative staff** to assist in **non-core tasks**.
- **Uniform Implementation:** There might be **inconsistencies** in the implementation of new laws across different regions.
 - **Strict monitoring and evaluation** mechanisms to ensure uniform implementation and adherence to the new laws.

The new criminal laws mark a significant shift in the duties of police officers in India, aiming to enhance transparency, accountability, and efficiency in law enforcement. While the new provisions offer substantial improvements, addressing the accompanying challenges through adequate resource allocation, training, and monitoring will

be crucial to achieving the intended benefits. As these changes take effect, continuous evaluation and adjustment will ensure that the police force is well-equipped to uphold justice in a rapidly evolving legal landscape.

MCQS

1. Consider the following statements regarding the criteria for declaring a language as classical in India:
 1. The language should have a history of early texts or recorded history spanning 1,500-2,000 years.
 2. It should possess a body of ancient literature or texts considered valuable by generations of speakers.
 3. The literary tradition must be original and not borrowed from another speech community.
 4. The language and its literature should be identical to their modern forms, with no discontinuity between the classical language and its later versions.
 Which of the statements given above are correct?
 - a) 1 and 2 only
 - b) 1, 2, and 3 only
 - c) 2, 3, and 4 only
 - d) 1, 2, 3, and 4
2. Consider the following statements regarding regenerative braking:
 1. In regenerative braking, mechanical energy converts into electrical energy to charge the battery.
 2. Regenerative braking eliminates the need for conventional hydraulic braking systems in vehicles.
 Which of the statements given above is/are correct?
 - a) 1 only
 - b) 2 only
 - c) Both 1 and 2
 - d) Neither 1 nor 2
3. Consider the following statements regarding the National Security Advisor (NSA):
 1. The NSA regularly advises the Prime Minister on matters related to both internal and external threats and opportunities for India.
 2. The post of NSA was first created by Prime Minister Atal Bihari Vajpayee in 1998.
 3. The National Security Council is headed by NSA.
 Which of the statements given above are correct?
 - a) 1 and 2 only
 - b) 2 and 3 only
 - c) 1 and 3 only
 - d) 1, 2 and 3
4. Consider the following statements:
 1. Prithvi Air Defence (PAD) is an anti-ballistic missile developed by India.
 2. PAD successfully intercepted a ballistic missile target in its first test.
 Which of the above statements is/are correct?
 - a) 1 only
 - b) 2 only
 - c) Both 1 and 2
 - d) Neither 1 nor 2
5. Consider the following statements about People's Biodiversity Register:
 1. It is prepared by forest guards in consultation with local communities.
 2. It is aimed to document and preserve India's rich biological diversity.
 Which of the statements given above is/are correct?
 - a) 1 only
 - b) 2 only
 - c) Both 1 and 2
 - d) Neither 1 nor 2
6. Consider the following statements about the Balance of Payments:
 1. A surplus in the BOP indicates that a country's total receipts from foreign transactions exceed its total payments to foreign entities.
 2. The BOP must always be balanced, with the sum of the Current Account and the Capital Account equaling zero.
 Which of the above statements is/are correct?
 - a) 1 only
 - b) 2 only
 - c) Both 1 and 2
 - d) Neither 1 nor 2
7. Consider the following:
 1. High antiquity of early texts over 1500-2000 years
 2. A body of ancient literature considered valuable heritage
 3. The literary tradition must be original and not borrowed
 4. The language must have at least 10 million native speakers
 How many of the above are the criteria for recognizing a language as a classical language in India?
 - a) Only one
 - b) Only two
 - c) Only three
 - d) All four
8. Consider the following statements:
 1. National Quantum Mission (NQM) aims to accelerate quantum technology-led economic growth and innovation.
 2. High quality polished gold is crucial for quantum research.
 Which of the statement(s) given above is/are correct?
 - a) 1 only
 - b) 2 only
 - c) Both 1 and 2
 - d) Neither 1 nor 2
9. Consider the following statements regarding the Bharatiya Nagarik Suraksha Sanhita (BNSS):
 1. Under the BNSS, officer in-charge of a police station cannot refuse to register an FIR on the basis of lack of jurisdiction.
 2. The BNSS mandates videography during a search conducted by the police.
 3. The word 'terrorist' has been defined by the BNSS.
 How many of the statements given above are correct?
 - a) Only one
 - b) Only two
 - c) All three
 - d) None
10. The primary function of a regenerative braking system in electric vehicles is to:
 - a) Convert kinetic energy into heat energy
 - b) Convert kinetic energy into electrical energy
 - c) Increase the speed of the vehicle
 - d) Reduce the vehicle weight