

# UPSC MAINS 2021

## GS PAPER - 3

Time Allowed: 3 hr.

Max. Marks: 250

1. Explain the difference between computing methodology of India's Gross Domestic Product (GDP) before the year 2015 and after the year 2015. (Answer in 150 words) (10)
2. Distinguish between Capital Budget and Revenue Budget. Explain the components of both these Budgets. (Answer in 150 words) (10)
3. How did land reforms in some parts of the country help to improve the socio-economic conditions of marginal and small farmers? (Answer in 150 words) (10)
4. How and to what extent would micro-irrigation help in solving India's water crisis? (Answer in 150 words) (10)
5. How is S-400 air defence system technically superior to any other system presently available in the world? (Answer in 150 words) (10)
6. Explain the purpose of the Green Grid Initiative launched at World Leaders Summit of the COP26 UN Climate Change Conference in Glasgow in November, 2021. When this idea was first floated in the International Solar Alliance (ISA)? (Answer in 150 words) (10)
7. Describe the key points of the revised Global Air Quality Guidelines (AQGs) recently released by the World Health Organisation (WHO). How are these different from its last update in 2005? What changes in India's National Clean Air Programme are required to achieve these revised standards? (Answer in 150 words) (10)
8. Discuss about the vulnerability of India to earthquake related hazards. Give examples including the salient features of major disasters caused by earthquakes in different parts of India during the last three decades. (Answer in 150 words) (10)
9. Discuss how emerging technologies and globalisation contribute to money laundering. Elaborate measures to tackle the problem of money laundering both at national and international levels. (Answer in 150 words) (10)
10. Keeping in view India's internal security, analyse the impact of cross-border cyber attacks. Also discuss defensive measures against these sophisticated attacks. (Answer in 150 words) (10)

11. Do you agree that the Indian economy has recently experienced V- shaped recovery? Give reasons in support of your answer. (Answer in 250 words) (15)
12. "Investment in infrastructure is essential for more rapid and inclusive economic growth." Discuss in the light of India's experience. (Answer in 250 words) (15)
13. What are the salient features of the National Food Security Act, 2013? How has the Food Security Bill helped in eliminating hunger and malnutrition in India? (Answer in 250 words) (15)
14. What are the present challenges before crop diversification? How do emerging technologies provide an opportunity for crop diversification? (Answer in 250 words) (15)
15. What are the research and developmental achievements in applied biotechnology? How will these achievements help to uplift the poorer sections of society? (Answer in 250 words) (15)
16. The Nobel Prize in Physics of 2014 was jointly awarded to Akasaki, Amano and Nakamura for the invention of Blue LEDs in 1990s. How has this invention impacted the everyday life of human beings? (Answer in 250 words) (15)
17. Describe the major outcomes of the 26th session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). What are the commitments made by India in this conference? (Answer in 250 words) (15)
18. Describe the various causes and the effects of landslides. Mention the important components of the National Landslide Risk Management Strategy. (Answer in 250 words) (15)
19. Analyse the multidimensional challenges posed by external state and non-state actors, to the internal security of India. Also discuss measures required to be taken to combat these threats. (Answer in 250 words) (15)
20. Analyse the complexity and intensity of terrorism, its causes, linkages and obnoxious nexus. Also suggest measures required to be taken to eradicate the menace of terrorism. (Answer in 250 words) (15)



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1. Explain the difference between computing methodology of India's Gross Domestic Product (GDP) before the year 2015 and after the year 2015.

*Hint:*

- Gross domestic production (GDP) is the final value of the goods and services which is produced within the geographic boundaries of a country during a specified period of time, normally a year.
- GDP is the most commonly used measure for the size of an economy.
- **GDP calculation in India before 2015:**
  - ▶ In India before 2015 GDP calculation was based on GDP at Factor cost with base year as 2004-2005.
- **GDP calculation in India after 2015:**
  - ▶ Post 2015 India has shifted GDP calculation from factor cost to market price with base year as 2011-2012.

2. Distinguish between Capital Budget and Revenue Budget. Explain the components of both these Budgets.

*Hint:*

- Budget consists of two parts that is revenue and capital budget with vertical sub-division of revenue and expenditure receipts.
- Capital budget covers capital items which are of non-recurring nature.
- Revenue budget covers revenue items which are of recurring nature and are non-redeemable.

3. How did land reforms in some parts of the country help to improve the socio-economic conditions of marginal and small farmers?

*Hint:*

- Land reform refers to efforts to reform the ownership and regulation of land in India by elimination of zamindari, ryotwari etc.
- Land reforms improved socio-economic condition of marginal farmer in following ways:
  - ▶ removal of intermediaries has strengthened the status of true landowners
  - ▶ Access to land for cultivation
  - ▶ Provided security of tenure

- ▶ Social Upliftment
- ▶ Fundamental changes
- India should now move towards second generation of land reforms focusing on digitization.

**4. How and to what extent would micro-irrigation help in solving India's water crisis?**

*Hint:*

- India is facing a harsh water crisis due to increasing corporate privatization, lack of proper planning, industrial and human waste.
- **Micro-irrigation help in solving India's water crisis**
  - ▶ clear solution to water wastage
  - ▶ process of **slow water application**
  - ▶ drip irrigation being up to 90 percent more efficient than flood irrigation
- **Issues:**
  - ▶ difficult to incentivize farmers
  - ▶ inadequate education and support of farmers
  - ▶ Slow spread of Micro Irrigation
- It has been found that the promotion of drip irrigation and a collaborative approach to tackling large scale water problems is the solution to the looming water crisis India faces.

**5. How is S-400 air defence system technically superior to any other system presently available in the world?**

*Hint:*

- Developed by Russia, the S-400 Triumf is a long-range surface to air missile (SAM) system.
- The different ranges and varying altitudes create a layered air defence net.
- The American-made Patriot and Russian S-400 Triumf air defense systems are currently the closest rivals.
- **Superiority:**
  - ▶ Four different types of missiles.
  - ▶ can destroy cruise missiles
  - ▶ Max. target speed is 4.8 kilometres per second
  - ▶ It is a fraction of the cost of THAAD or patriot.
- The S-400 has emerged as a major flashpoint between Russia and the U.S.
- S-400 fills important gaps in India's national air defence network and would complement India's indigenous Ballistic Missile Defence system.

**6. Explain the purpose of the Green Grid Initiative launched at World Leaders Summit of the COP26 UN Climate Change Conference in Glasgow in November, 2021. When this idea was first floated in the International Solar Alliance (ISA)?**

*Hint:*

- India had first proposed connecting solar energy supply across borders at the International Solar Alliance in 2018.
- A 'green grids' initiative—the One Sun One World One Grid (OSOWOG) project was launched on the sidelines of the COP26 summit.
- The project will connect energy grids across borders to facilitate a faster transition to the use of renewable energy.
- **Purpose of the project:**
  - ▶ Interconnected transnational grids are future.

- ▶ addressing the issue of reliability of supply from solar power plants
- ▶ addressing the issue of high cost of energy storage
- ▶ will reduce the costs of the energy transition

**7. Describe the key points of the revised Global Air Quality Guidelines (AQGs) recently released by the World Health Organisation (WHO). How are these different from its last update in 2005? What changes in India's National Clean Air Programme are required to achieve these revised standards?**

*Hint:*

- **New Guidelines:**
  - ▶ New WHO Global Air Quality Guidelines (AQGs) provide clear evidence of the damage air pollution inflicts on human health.
  - ▶ WHO has adjusted almost all the AQGs levels downwards in comparison to its last updates of 2005
  - ▶ Aims to reduce 48 % of total global death burden due to PM2.5 solely.
  - ▶ WHO's new guidelines recommend air quality levels for 6 pollutants
- **New Air Quality Guidelines vs global update 2005**
  - ▶ lowered the average concentration of all the six pollutants
  - ▶ light good practices for the management of certain types of particulate matter
- **India's National Clean Air Programme**
  - ▶ NCAP is a long-term, time-bound, national level strategy to tackle the air pollution.
  - ▶ 122 non-attainment cities have been identified.

**8. Discuss about the vulnerability of India to earthquake related hazards. Give examples including the salient features of major disasters caused by earthquakes in different parts of India during the last three decades.**

*Hint:*

- An earthquake is caused by a sudden slip on a fault.
- **Vulnerability of India:**
  - ▶ increase in earthquake risk is due to a spurt in developmental activities
  - ▶ Disruption due to relatively moderate ground shaking.
  - ▶ Approximately 11 percent area falls in zone V, 18 percent in zone IV, 30 percent in zone III and remaining in zone II.
- **Earthquakes in India during the last three decades:**
  - ▶ Bihar - Nepal Earthquake of 1988
  - ▶ Uttarkashi Earthquake of 1991
  - ▶ Jabalpur Earthquake of 1997
- Between March 2020 and February 2021, a total of 1,013 earthquakes with magnitude 3 and above have been reported. Most of the earthquakes have occurred in the Himalayan arc region, Indo-Myanmar region and Andaman-Nicobar region

**9. Discuss how emerging technologies and globalisation contribute to money laundering. Elaborate measures to tackle the problem of money laundering both at national and international levels.**

*Hint:*

- Money laundering is the illegal process of concealing the origins of money obtained illegally by passing it through a complex sequence of banking transfers or commercial transactions.

- **Technologies and globalization has given impetus money laundering in several ways:**
  - ▶ anonymous online payment services and peer-to-peer (P2P) transfers
  - ▶ use of proxy servers and anonymizing software
  - ▶ **Trade-based laundering is one of the newest and most complex forms of money laundering**
  - ▶ alternate banking systems allowing undocumented money transfers across regions
- **Measures Taken by the Government to prevent Money laundering:**
  - ▶ Constitution of the Special Investigation Team (SIT)
  - ▶ The Black Money (Undisclosed Foreign Income and Assets) and Imposition of Tax Act, 2015
  - ▶ Benami Transactions (Prohibition) Amendment Act, 2016
  - ▶ Prevention of Money Laundering Act, 2002 (PMLA)
- **Global initiatives to curb money laundering"**
  - ▶ Vienna convention
  - ▶ Basle committee's statement of principles
  - ▶ Financial Action Task Force (FATF)
  - ▶ United Nations Global Programme Against Money Laundering (UNGPMML)

**10. Keeping in view India's internal security, analyse the impact of cross-border cyber attacks. Also discuss defensive measures against these sophisticated attacks.**

*Hint:*

- Cross border cyber-attack can weaken, disrupt or destroy another nation.
- **Impact of cross border cyber-attack on India:**
  - ▶ result in victims being outside the legal jurisdiction
  - ▶ can cause electrical blackouts and failure of military equipment
  - ▶ theft of valuable, sensitive data like medical records
  - ▶ Data breaches have cost organizations in India 12.8 crore during 2018-19.
  - ▶ loss of brand value
- **Initiatives taken:**
  - ▶ National Crisis Management Committee (NCCM)
  - ▶ National Critical Information Infrastructure Protection Centre (NCIIPC)
  - ▶ National Cyber Coordination Centre (NCCC)
  - ▶ MoUs related to Cyber
  - ▶ CERT-In
- **Suggestive measures:**
  - ▶ Acceding to Budapest convention
  - ▶ Implement a Cyber Crisis Management Plan
  - ▶ Cyber Security mock drills
  - ▶ push for an international court to prosecute transnational cyber crimes

**11. Do you agree that the Indian economy has recently experienced V- shaped recovery? Give reasons in support of your answer.**

*Hint:*

- In a V-shaped recovery, an economy that has suffered a sharp economic decline experiences a fast and strong rebound.
- A V-shaped recovery can be thought of as a best-case scenario for an economy in recession.



- **India experienced V shaped recovery:**
  - ▶ The economy contracted by 17% in Q1 of 2020 which narrowed down by second quarter with GDP growth rate of -7.5%.
  - ▶ India's GDP figures showed the growth at 3 per cent in Q4 of FY20.
  - ▶ Economic Survey has also projected a strong V shaped recovery with an 11% growth in FY22.
- **Reasons for the V shaped recovery**
  - ▶ Easing down of COVID imposed lockdowns
  - ▶ monetary measures by RBI
  - ▶ Increase in government investment
  - ▶ robust recovery in the services sector

**12. "Investment in infrastructure is essential for more rapid and inclusive economic growth." Discuss in the light of India's experience.**

*Hint:*

- The infrastructure contributes 4% to GDP.
- **Investment in infrastructure is essential for more rapid and inclusive economic growth:**
  - ▶ Employment generation
  - ▶ Sustained Growth
  - ▶ Increase in FDI
  - ▶ GDP Growth
  - ▶ Sustainable Growth
  - ▶ Decrease in Logistic Cost
  - ▶ Ease of Living
  - ▶ Social Sector Development
  - ▶ Bridge Rural-Urban Divide
- Over the past two decades, India's contribution to global economic growth has doubled to almost 15 percent.
- The Government has taken efforts to promote world class infrastructure through various missions such as NIP, PM Gati Shakti Master Plan etc. which assures a prompt growth with required investment.

**13. What are the salient features of the National Food Security Act, 2013? How has the Food Security Bill helped in eliminating hunger and malnutrition in India?**

*Hint:*

- National Food Security Act, 2013 aims to provide subsidized food grains.
- **Salient features of the NFSA are:**
  - ▶ Coverage and entitlement
  - ▶ Maternity benefit
  - ▶ Nutritional support
  - ▶ Subsidised food
  - ▶ Women empowerment
  - ▶ Grievance Redressal
  - ▶ Food security allowance
- **NFSA role in eliminating hunger and malnutrition:**
  - ▶ Wide coverage of the 2/3rd population
  - ▶ Improved access to food grains

- ▶ food security and nutrition support.
- ▶ Monetary compensation

**14. What are the present challenges before crop diversification? How do emerging technologies provide an opportunity for crop diversification?**

*Hint:*

- In the aftermath of technological changes encompassing bio-chemical and irrigation technologies, the agronomic niches are undergoing significant changes.
- **Challenges before crop diversification**
  - ▶ Crop diversity is not possible without a guaranteed MSP.
  - ▶ Dependence on rainfall
  - ▶ over-use of resources
  - ▶ Inadequate supply of seeds
  - ▶ Fragmentation of land holding
  - ▶ Poor basic infrastructure
  - ▶ Inadequate post-harvest technologies
  - ▶ Weak agro-based industry.
  - ▶ Poor database for horticultural crops.
  - ▶ Decreased investments.
- **Technologies provide an opportunity for crop diversification:**
- Farm mechanization
- Yield level of most crops has witnessed an upward shift
- agriculture become drought proof
- enhancing plant productivity, quality, health and nutritional value

**15. What are the research and developmental achievements in applied biotechnology? How will these achievements help to uplift the poorer sections of society?**

*Hint:*

- Applied biology encompasses the industrial application of the inventions made in the field of biotechnology.
- **Recent advancements in Biotechnology:**
  - ▶ Bio-production of sustainable chemicals, energy, and other materials
  - ▶ Genetically modified crops to increase sustainable food production
  - ▶ Rapid and precise development and manufacturing of medicine and vaccines
  - ▶ Biotech improvements to environment
- Industrial use of biotechnology may pave the way to solve or minimize the impact of almost every problem that any common human being faces.

**16. The Nobel Prize in Physics of 2014 was jointly awarded to Akasaki, Amano and Nakamura for the invention of Blue LEDs in 1990s. How has this invention impacted the everyday life of human beings?**

*Hint:*

- Light emitting diodes (LEDs) are components of electrical circuits that produce light.
- In 2014 Isamu Akasaki and Hiroshi Amano worked together on producing high quality gallium nitride, a chemical that appears in many of the layers of blue led.



- **Significance of blue LED is:**
  - ▶ enabled the use of LEDs to make white light
  - ▶ converts more than 50% of the electricity into light
  - ▶ White LED saves money and electricity
  - ▶ street lightening
  - ▶ used in screens of smartphones and laptops
- Government has capitalized the potential of LED through programmes like UJALA and LED Street lightening national programme.

**17. Describe the major outcomes of the 26th session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC). What are the commitments made by India in this conference?**

*Hint:*

- **Major outcomes:**
  - ▶ Adopted Glasgow Climate Pact
  - ▶ Asked countries to strengthen their 2030 climate action plans
  - ▶ Called for an annual synthesis report
  - ▶ efforts to reduce usage of coal
  - ▶ Called for phase-out of fossil fuels.
  - ▶ Asked the developed countries to at least double the money being provided for adaptation
- **India's Commitments at COP 26**
  - ▶ Panchamitra of climate actions
  - ▶ Indian Railways' commitment of net-zero by 2030
  - ▶ climate adaptation should be at the centre of all developmental schemes and policies
- In a time marked by uncertainty, mistrust and escalating climate impacts, COP26 has affirmed just how essential collective global action is to address the climate crisis.

**18. Describe the various causes and the effects of landslides. Mention the important components of the National Landslide Risk Management Strategy.**

*Hint:*

- Landslide is downward movement in the slope under the influence of gravity with a velocity ranging from very slow to very rapid.
- **Causes of landslides:**
  - ▶ consequence of a complex field of forces
  - ▶ urbanisation
  - ▶ massive deforestation
  - ▶ Road construction and mining activities
  - ▶ heavy rain
- **Effects of Landslides:**
  - ▶ Lead to economic decline
  - ▶ Decimation of infrastructure
  - ▶ Loss of life
  - ▶ Affects beauty of landscapes
  - ▶ Impacts river ecosystems
- **National Landslide Risk Management Strategy:**

- ▶ Landslide Hazard Zonation
- ▶ Landslide Monitoring and Early Warning System
- ▶ Awareness Programmes
- ▶ Capacity Building and Training of Stakeholders
- ▶ Preparation of Mountain Zone Regulations and Policies
- The national imperative towards safety due to landslide initiation is increasing in view of the higher rate of human settlement in the mountain slope across the country.
- It is estimated that economic loss due to landslides may reach between 1-2% of the gross national product.

**19. Analyse the multidimensional challenges posed by external state and non-state actors, to the internal security of India. Also discuss measures required to be taken to combat these threats.**

*Hint:*

- The emergence of non-state terrorist actors and their international influence is accelerating.
- **Threats posed by external state actors to the internal security of India:**
  - ▶ Indian security is marred by legacy issues that include unresolved boundary disputes
  - ▶ No mutually agreed line of control
  - ▶ internal peace and external security are inextricably intertwined due to 11 neighbouring countries (including four across the seas)
- **Threats posed by non-state actors to the internal security of India:**
  - ▶ Threat to multi-religious, multi-ethnic, and pluralistic societies.
  - ▶ Strategies need to be evolved to counter the threat of Weapons of Mass Destruction (WMD)
  - ▶ fake currency
  - ▶ smuggle weapons and drugs
  - ▶ propagate religious hatred
  - ▶ incite people for regionalism
- **Suggestions:**
  - ▶ comprehensive strategy
  - ▶ focussed resource-rich responses in dismantling the various links in the terror chain
  - ▶ creation of Special Forces
  - ▶ coastal border security must be strengthened

**20. Analyse the complexity and intensity of terrorism, its causes, linkages and obnoxious nexus. Also suggest measures required to be taken to eradicate the menace of terrorism.**

*Hint:*

- Terrorism found in India includes religious terrorism, separatist terrorism, state sponsored terrorism and left wing terrorism.
- Terrorist groups have the potential to utilize many different types of terrorism tactics.
- Forms of terrorism faced by India include hijacking and blowing up of aircrafts, sabotaging railway tracks, kidnapping, bombings, and suicide attacks.
- **Linkage and obnoxious nexus of terrorism:**
  - ▶ In India's north-east, almost all militant groups run a parallel government.
  - ▶ In Kashmir, the linkages between terrorists and organised crime exist at a different level.
  - ▶ Sporadic incidents in other parts of India, like the Mumbai blasts, have exposed the connection between terrorism and organised crime.

- **Suggestions to negate the menace of terrorism:**
  - ▶ suppressing the financing of terrorism
  - ▶ Promoting dialogue and co-operation on counter-terrorism issues
  - ▶ protecting human rights
  - ▶ efforts to implement non-proliferation of weapons of mass destruction
- Terrorism is one of the most significant threats to peace, security and stability, as well as to the enjoyment of human rights and social and economic development, in India and beyond.

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GS SCORE