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GENERAL STUDIES (TEST CODE : 856)

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Medium Eng./Hindi	ENGLISH	Registration Number	35605
Center		Date	7/1/2017

INDEX TABLE

Q. No.	Maximum Marks	Marks Obtained
1	12.5	
2	12.5	
3	12.5	
4	12.5	
5	12.5	
6	12.5	
7	12.5	
8	12.5	
9	12.5	
10	12.5	
11	12.5	
12	12.5	
13	12.5	
14	12.5	
15	12.5	
16	12.5	
17	12.5	
18	12.5	
19	12.5	
20	12.5	

Total Marks Obtained:

Remarks:

INSTRUCTIONS

- Do furnish the appropriate details in the answer sheet (viz. Name, Registration Number and Test Code).
उत्तर पुस्तिका में सूचनाएं भरना आवश्यक है (नाम, प्रश्न-पत्र कोड, विद्यार्थी क्रमांक आदि)।
- There are TWENTY questions printed in ENGLISH & HINDI इसमें बीस प्रश्न हैं अंग्रेजी और हिन्दी में छपे हैं।
- All questions are compulsory.
सभी प्रश्न अनिवार्य हैं।
- The number of marks carried by a question/part is indicated against it.
प्रत्येक प्रश्न/भाग के अंक उसके सामने दिए गए हैं।
- 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.
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।
- Word limit in questions, if specified, should be adhered to.
प्रश्नों में शब्द सीमा, जहाँ विनिर्दिष्ट है, का अनुसरण किया जाना चाहिए।
- Any page or portion of the page left blank in the Question-Cum-Answer Booklet must be clearly struck off.
उत्तर पुस्तिका में खाली छोड़ा हुआ पृष्ठ या उसके अंश को स्पष्ट रूप से काटा जाना चाहिए।

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103, 1st Floor, B/1-2, Ansal Building, Behind UCO Bank, Dr. Mukherjee Nagar, Delhi – 110009

EVALUATION INDICATORS

1. Alignment Competence
2. Context Competence
3. Content Competence
4. Language Competence
5. Introduction Competence
6. Structure - Presentation Competence
7. Conclusion Competence

Overall Macro Comments / feedback / suggestions on Answer Booklet:

1.

2.

3.

4.

5.

6.

All the Best

Answer all the questions in NOT MORE THAN 200 WORDS each. Content of the answers is more important than its length. All questions carry equal marks.

12.5X20=250

1. Explain the reasons for the following: (a) Erosional forms dominate in the west coast while depositional forms dominate in the east coast of India. (b) Western Ghats in Karnataka receive more monsoon rainfall than Maharashtra and Kerala.

निम्नलिखित के कारणों की व्याख्या कीजिए: (a) भारत के पश्चिमी तट में अपरदनजन्य रूपों की अधिकता या बाहुल्य पाया जाता है, जबकि पूर्वी तट पर निक्षेपण रूपों का बाहुल्य पाया जाता है। (b) कर्नाटक में पश्चिमी घाट महाराष्ट्र और केरल की तुलना में अधिक मानसूनी वर्षा प्राप्त करते हैं।

(a) Reasons for the domination of erosional land forms on the west coast like estuaries, narrow river mouths ~~and of deposits~~ while that of depositional landforms on the east coast are:-

(i) Narrow western coast:- Coast on the western side being narrower doesn't allow deltas to expand and rivers have generally low deltas.

(ii) Increasing no. of rivers flowing eastwards:- Most of the large rivers flow towards eastern coast as general slope of

the peninsula being eastwards
(iii) low sedimentation carrying
west flowing rivers :- West
flowing rivers like Narmada, Tapi
or other smalls rivers flow
through rift valley generally
carrying low sediments compared
to east flowing rivers being
large travelling large distances
and carrying huge amount
of sediments.

(iv) western coast having hard
rocks, rivers have to cut
through the rock eroding
them. ~~Because of the same~~
(v) wave landforms also due to
hard rocks and steep cliffs
on western coast erode
more than deposit, opposite
being the case for eastern coast.

(b) Western Ghats in Karnataka receive more rainfall than Maharashtra and Kerala, because:-

(i) Presence of certain gaps in western ghats in Kerala and Maharashtra does not act as a barrier as effectively as in Karnataka

(ii) Karnataka having more landmass compared to Kerala has moisture containing SW monsoon winds for a comparatively longer ~~distance~~ ^{hence} raining more.

(iii) Karnataka facing SW monsoon wind almost perpendicular to the coast ~~but~~ hence ranges there acting as an effective barrier whereas some part of Kerala and Maharashtra becoming parallel to winds hence getting by-passed.

2. What do you mean by bad ozone and what are the causes for its formation? Explain the reasons for the depletion of ozone, with special reference to formation of Ozone hole over Antarctica.

बैड ओजोन से आप क्या समझते हैं एवं इसके निर्माण के क्या कारण हैं? अंटार्कटिका के ऊपर ओजोन छिद्र के निर्माण के विशेष संदर्भ में ओजोन अवक्षय के कारणों की व्याख्या कीजिए।

Ozone layer in the stratosphere act as a protective covering for the earth from harmful uv rays from the sun.

→ The ozone ~~which has lost its effectiveness and is being depleted~~ due to various reasons. can be termed as bad ozone

→ ~~Also~~ ozone acting as protective layer in stratosphere can be harmful at other places like in lower atmosphere ~~as it can be~~ it's bad ozone. It can be formed due to reaction of oxygen with certain emissions from our earth's surface.

→ In recent past it has been found that ozone layer is depleting due to certain anthropogenic reasons and over special areas like ozone hole in Antarctic due to combined effect of natural & anthropogenic reasons.

Reasons can be

- (i) Increased pace of development leads to emission of certain substances which react with ozone causing its depletion
- (ii) Chlorofluoro Carbons (CFCs) emitted from ~~use~~ use of refrigerating and air conditioning devices react in stratosphere to form free chlorine ions which cause ozone depletions.

(iii) Also recently it has been found that the alternative to CFCs or otherwise, HFCs (Hydrofluorocarbons) emission also cause ozone depletion.

(iv) Antarctica being an isolated region has been the major area bearing the brunt of ozone depletion.

↳ It doesn't have certain other elements in atmosphere being isolated to cover up the reaction of ozone depletion hence a hole being identified there.

↳ Also the conditions, there aid the formation of free chlorine which leads to the depletion.

Way forward :- There needs to be curb on CFCs and HFCs emission and a balance to be maintained b/w ^{developed} and env. for which Montreal & Kigali meetings were held.

3. Weather and climate information plays a significant role in increasing agricultural productivity as well as minimising crop losses. Comment. In light of the increasing instances of extreme weather events, examine the ways in which information system can be made more effective and inclusive.

मौसम और जलवायु संबंधी सूचना कृषि उत्पादकता को बढ़ाने एवं साथ ही साथ फसल के नुकसान को कम करने में महत्वपूर्ण भूमिका निभाती है। टिप्पणी कीजिए। चरम मौसम की बढ़ती हुई घटनाओं के प्रकाश में सूचना प्रणाली को अधिक प्रभावशाली एवं समावेशी बनाने के तरीकों का परीक्षण कीजिए।

Agriculture is the economic activity which is largely dependent on weather and climatic conditions as the parameters like temperature, moisture content hence rainfall, pressure, etc. having direct implications for type of agriculture & its productivity.

→ Farmers, if aware of the parameters of weather and climate can decide effectively to choose the crop type, amount of irrigation needed, time of sowing, amount of nutrients (fertilizers) to be added (according to soil type), and other things which can

definitely improve productivity and also can minimise losses due to untoward incidences not expected and be prepared for before. For instance, farmers growing water intensive crops in drought prone or water deficient areas can lead to increased need for irrigation and if not available leading to crop loss or decreased productivity.

→ Also water logging due to increased irrigation can lead to increase in soil salinity due to evaporation or in hot and dry climate hampering fertility of soil.

eg:- Punjab & Haryana region's salinity increased due to increased irrigation as they started cultivating water intensive crop like paddy in dry and hot climatic region.

→ ways to make information system
effective ~~z~~ and inclusive ~~z~~

- (i) Periodic information dissemination
by weather forecasting departments
like IMD.
- (ii) encouraging private weather
forecasters to come up to
provide information at local
level about region specific
climatic or weather changes.
- (iii) Improving technology and infrastru-
-cture to incorporate best
practices about effective forecasting
as well as dissemination,
like recent dynamic forecasting
model mandated by IMD.
- (iv) encouraging youth and local people
to do research and invest in R&D
to make technological advancement
like recent UAVs to survey
paddy fields by North Eastern
Space Application Centre (NESAC).

4. India's first National Disaster Management Plan may fulfill the legal requirement of having a plan but it may not be very effective in achieving its objective of building resilience. Critically analyse.

भारत की प्रथम राष्ट्रीय आपदा प्रबंधन योजना, भले ही एक योजना होने की विधिक आवश्यकता को पूर्ण कर सकती है किन्तु यह प्रत्यास्थता निर्माण करने के अपने उद्देश्य को प्राप्त करने में अधिक प्रभावी नहीं हो सकती। आलोचनात्मक विश्लेषण कीजिए। -1

India recently adopted its first National Disaster Management Plan under section 11 of DMA, 2005.

It covers all the ~~plan~~⁴ aspects

Sendai Framework of UNISDR of,

- (i) ~~Identify~~¹ Understanding Disaster Risk.
- (ii) Improving risk reduction governance
- (iii) Investing in risk reduction infra. (structural & non structural)
- (iv) Better Building back and recovery.

→ It fulfilled the legal requirement of having a plan under DMA 2005 but has both advantages and certain ~~inefficient~~ potential inefficiencies,

Advantages:-

- (i) Covers all the phases of disaster management: preparedness, mitigation

~~also~~ response & recovery.

- (ii) Charts out responsibilities of all the level of governments up till local urban bodies and Panchayat levels.
- (iii) Focuses on better building back and improving risk reduction framework
- (iv) Charts the activities like response, medical aids, transport, search & rescue, etc. to serve as a checklist for the immediate acting agency on disaster.

→ But it is not free from disadvantages or challenges or inefficiencies left out :-

- (i) It mandates a top-down approach, similar to, a general modus-operandi of all our major policies and plan. It also Disaster management should be a bottom-up approach
- (ii) Not much emphasis on role of civil organisations & NGOs which come in handy during any incident

- as seen recently during Chennai floods.
- (iii) Not much focus on the core
aspect of Sendai framework or
~~other~~ otherwise to if
risk reduction.
- (iv) Much emphasis is on ^{specifying} role
of government bodies with
neglect of increasing awareness
among the civil society and
making improving preparedness.

Way Forward:- Disaster management
Plan should focus on risk
reduction, preparedness more and
increasing role of civil society
organisations like NGOs to
give effort to a bottom up
management and response
approach with government
helping in preparedness & response
infrastructure development.

5. A better prepared community is key to effective disaster risk reduction. Citing specific examples, examine the importance of the role of local government and community in dealing with disasters.

प्रभावी आपदा जोखिम न्यूनीकरण के लिए एक बेहतर रूप से तैयार समुदाय महत्वपूर्ण है। विशिष्ट उदाहरण देते हुए आपदाओं से निपटने में स्थानीय सरकार एवं समुदाय की भूमिका के महत्व का परीक्षण कीजिए।

Disaster Management has always been about the immediate responders of the untoward incident which is facing community, local government and ^{active} civil society organisations

→ Importance of local community :-

- (i) They are the first responders, hence better prepared and better informed community can effectively take immediate measures to reduce risk.

eg:- Prepared community in Chennai^o floods could've started evacuation (as NE monsoon ~~is~~ a yearly phenomenon) from sensitive areas reducing risk and destruction it caused.

(ii) Better prepared community could come with civil society organisations (NGOs) / volunteers ~~for~~ remaining alert and monitoring any risk or vulnerability periodically and also providing relief and essential commodities during any misadventure incident.

→ Importance of local governance &

(i) ~~Adapt~~ Responding immediately with specific regional conditions kept in mind as ~~the~~ this level of government better understands local, region specific risks.

(ii) Acting as a chief line of communication during any event between local community and national or state level response team (like NDRF)

(iii) ~~And~~ Providing an enabling environment for civil organisations.

6. Oceanic crustal rocks are much younger than the continental crust rocks. Explain with the help of the concept of sea floor spreading.

महासागरीय पर्पटी की चट्टानें महाद्वीपीय पर्पटी की चट्टानों की अपेक्षा अधिक नवीन हैं। सागरीय अधस्तल विस्तार की अवधारणा की सहायता से व्याख्या कीजिए।

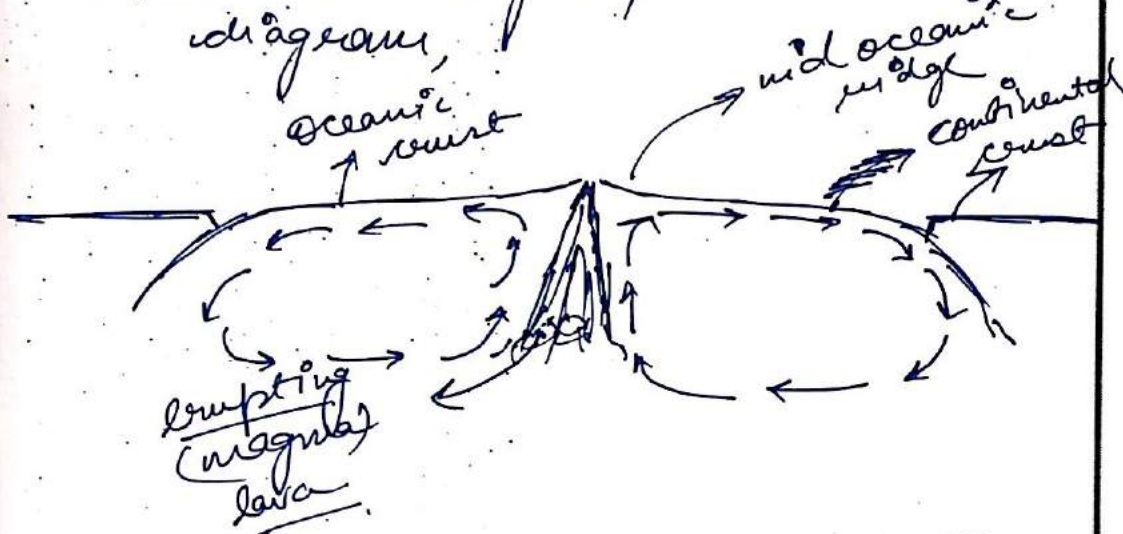
Oceanic crustal rock is generally basaltic, much younger than continental crust, ~~the~~ none being more than around 300 Mn Years old.

~~Oceanic bottom~~

→ Reason could be understood by the understanding of the concept of sea floor spreading:-

- * Ocean bottom relief has various landforms like the ~~oceanic~~ continents, including continental shelf, continental slope, continental rise, Deep sea trench, Abyssal Plains.
- In ~~between~~ the middle of abyssal Plains there lies, Mid oceanic Ridges, which are the active volcanism ~~sites~~ sites. (MOR)

- Understanding by the below diagram,



- As shown by the cells, below the crust, MOR is located on the ascending limb of convection cell of heated magma beneath the crust.
- As pressure develops, magma is in continuous eruption at the MOR.
- Lava being basaltic, flows larger distances and reaches the ocean - continent crust boundary.
- Also the oceanic crust being basaltic and heavier subducts under the continental crust as shown along the trench.

Hence as ~~we~~ seen shown, continuous
eruption of ~~40~~ new lava (basaltic)
along the MOR and at the
same time ~~subduction~~ of its
spreading along the ocean floor
and subduction at the trench
beneath continental crust
causes oceanic crust to ~~be~~
have younger rocks (basaltic)
as the older layers getting
subducted at the trench
margin beneath continental
crust.

7. The composition of lava materials determines the types of volcanoes. Illustrate. Also give an account of intrusive landforms formation due to volcanic activities.

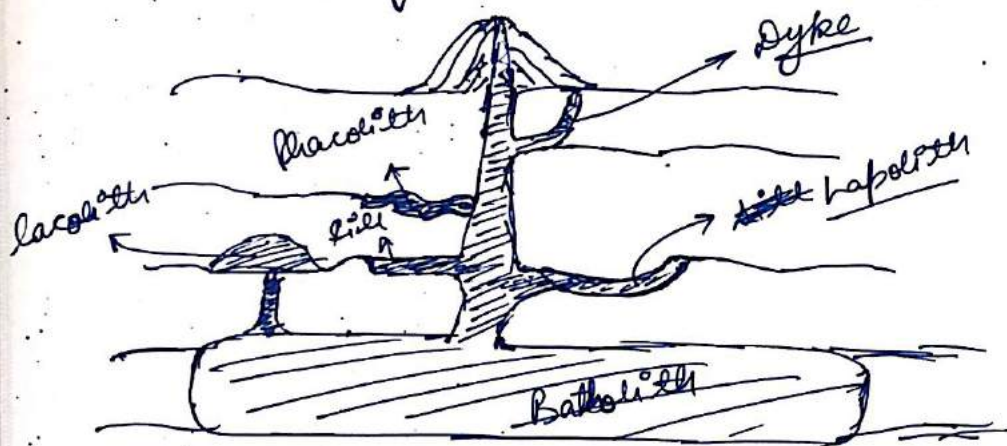
लावा पदार्थों का संघटन ज्वालामुखियों के प्रकारों को निर्धारित करता है। उदाहरण देकर स्पष्ट कीजिए। साथ ही, ज्वालामुखीय क्रियाओं के कारण अंतर्वेधी आकृतियों के गठन का विवरण भी प्रदान कीजिए।

The properties of the lava ~~like~~ ^{viscosity, density, fluidity, etc.} ~~material~~ getting erupted ~~also~~ in volcanism determines the volcano type.

Types of volcanoes :

- (1) Shield volcano → If the lava material is fairly ~~fluid not~~ ^{viscous} it will flow less and get accumulated around vent making volcanic cone.
- (2) Flood spreading volcano → If the lava material is ~~at~~ least viscous having high fluidity will flow large distances ~~no~~ layer over layer and make lava plains or plateaus. (eg:- deccan plateau).
- (3) Caldera → If lava material is dense and heavy enough also the eruption is violent then erupted

material collapse upon itself making depressions. It turns into a lake when filled with water.
 → Volcanism makes leads to the development of various landforms at times lava. cooling below the surface only or in cracks developing intrusive landforms.



- (1) Dyke:- Almost perpendicular conduit like landform for cooling & freezing beneath the surface
- (2) Batholith:- A ~~small~~ large reservoir like accumulation of lava from which several eruption conduits come out
- (3) Lapolith, Sill & Sill :-

Freezing of lava in cracks and
layers beneath.

Concave to sky → Lapoli

Almost parallel to layer → Sill

Wavy → Phacoli

- (4) Lacoli → A small accumulation
of lava material
freezing in dome shape, flat
bottom and a conduit of
lava below.

These are the various intrusive
landforms formation due to
volcanic activities.

8. What do you understand by sea farming? Analyse its prospects and potential to provide sustainable livelihood within the country. Also bring out the challenges in adoption of this technique.

सी फॉर्मिंग (सागरीय कृषि) से आप क्या समझते हैं? देश के लिए संधारणीय आजीविका प्रदान करने हेतु इसकी संभावनाओं और क्षमता का विश्लेषण कीजिए। इस तकनीक को अपनाने में आने वाली चुनौतियों को भी स्पष्ट कीजिए।

Sea farming :- Farming activities
carried out under sea
water, like aquaculture or
farming of certain sea
needs.

Its potential :-

(i) Can provide sustainable
livelihood to certain section of
the population like landless
labourers or those on infertile
coastal regions or islands where
traditional land agriculture is
not possible due to natural
reasons.

(ii) Large companies adopting sea
farming on large scale can
give employment to the unemployed
as it is not much explored

sector so far.

Certain challenges :

- (i) Expertise in the sector yet not developed fully and certain domain skills are required
 - (ii) should be done ~~in~~ in accordance with provisions for protection of marine ecosystem so as to not lead to ecological disruption
 - (iii) Advanced ~~in~~ equipments and tools ~~at training~~ for skill nascent.
 - (iv) Skill development and proper understanding of the technique required.
- can prove to be a boon for the country. but prior to that certain prerequisites need to be kept in mind like skill development, domain knowledge & training and most importantly ecological preservation.

9. Explain the origin of earth's magnetism. Discuss its significance with special reference to its interaction with solar particles as well as artificial satellites.

पृथ्वी के चुंबकत्व की उत्पत्ति की व्याख्या कीजिए। सौर कणों और साथ ही कृत्रिम उपग्रहों के साथ इसकी अंतरक्रिया के विशेष संदर्भ में इसके महत्व पर चर्चा कीजिए।

Earth being a celestial body composed of various types of elements, materials and compounds exhibit magnetism, with separate north and south poles.

- Its composition of several magnetic materials and elements give rise to specific magnetic field
- Also the ^{volcanic} eruptions, mainly along the mid oceanic ridges erupts materials which acquire magnetism after eruption due to prevailing condition forming different magnetic bands adds to earth's magnetism (Palaeomagnetism)

Significance of earth's magnetism:-

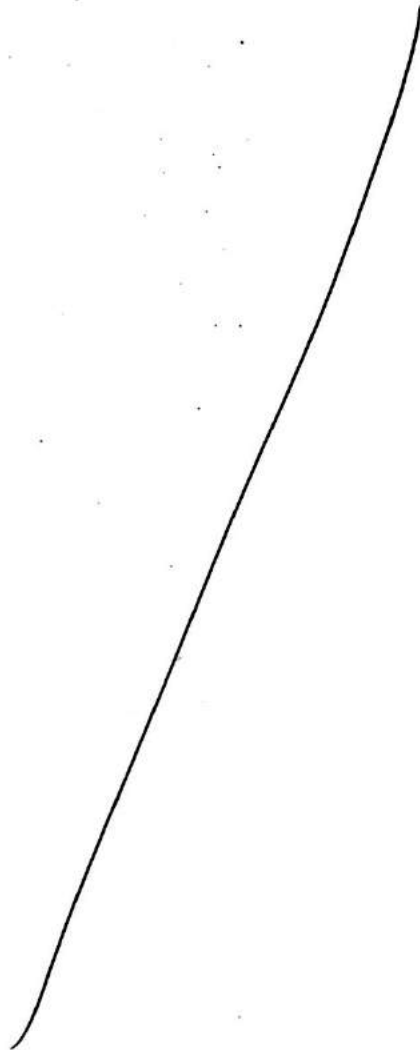
(i) → It enables various instruments useful for navigation and other utility like compass to work and calibrate

(ii) Interaction with solar particles:-

At the polar regions, troposphere being lower in height and presence of charged ions due to presence of magnetic fields lines interact with solar particles developing/emitting colourful light which is ~~a pleasure to~~ called Auroras, which is a pleasure to see hence favourable for tourism.

(iii) Interaction with artificial satellites:-

Supports calibration of satellites to function effectively.



10. An emissions-reduction approach to fighting global warming is not enough. Alternative solutions involving climate engineering might have to be deployed sooner than we think. Defining climate engineering, critically examine the statement.

ग्लोबल वार्मिंग से निपटने के लिए केवल उत्सर्जन-न्यूनीकरण उपागम (दृष्टिकोण) पर्याप्त नहीं है। संभवतः हमें अनुमानित समय से पूर्व ही, क्लाइमेट इंजीनियरिंग को सम्मिलित करने वाले वैकल्पिक समाधान को अपनाने की आवश्यकता पड़ सकती है। क्लाइमेट इंजीनियरिंग को परिभाषित करते हुए, इस कथन का आलोचनात्मक परीक्षण कीजिए।

Increased pace of industrial development and other anthropogenic activities have increased the emission of GHGs which lead to global warming.

→ Recently there has been concerns raised about rising temperature levels and high level meetings like Paris COP21 under UNFCCC being held to adopt emission reduction measures.

→ Emissions-reduction approach though adopted with consensus needs to be supported and aided by other solutions

as well.

One of them being climate engineering.

→ It is an approach focussing on understanding the core causes of climate change and applying innovative engineering methods like ^{artificial} carbon ^{dioxide} sinks, sequestration technologically.

→ Recent approach of ^{mandated} emission-reduction has positive prospects but certain efficiency challenges as well.

Pros:-

- (i) It will concentrate on reducing GHG emissions by adopting non-conventional energy and renewable approaches.
- (ii) Collective responsibility could help reduce harmful GHG concentration in atmosphere which traps terrestrial long wave radiations.

Q. 0
(10)~~Q. 0~~

Additional Alternative solutions
needed because :-

- (i) The current level of ~~temp~~ and pace of development will make it challenging for emissions-reduction approach only to control ~~of~~ temperature rise.
- (ii) we have come a long way forward and controlling just emissions can't right the past mistake of unsustainable development.
- (iii) According to certain researches and studies, ^{even} the commitments under COP 21, Paris, which is most favourable agreement ever on climate change ~~can~~ if ever followed completely cannot be able to control temperature rise of 1.5°C over pre-industrial levels (even ideally).

Way Forward: Hence innovative, technological alternative solutions also needed to aid the most celebrated ~~treaty~~ commitments.

11. While India embarks upon building urban infrastructure such as smart cities over the coming years, it is important that cities and infrastructure being built take into account the vulnerability of the area to various hazards. Discuss in context of recent flooding in major cities of the country.

भारत द्वारा आने वाले वर्षों में, स्मार्ट शहरों जैसी शहरी अवसंरचना का निर्माण प्रारम्भ करने को ध्यान में रखते हुए यह महत्वपूर्ण है कि शहर एवं अवसंरचनाओं के निर्माण के समय विभिन्न खतरों के प्रति क्षेत्र की जोखिम सुभेद्यता को ध्यान में रखा जाए। देश के प्रमुख शहरों में हाल में आयी बाढ़ों के संदर्भ में चर्चा कीजिए।

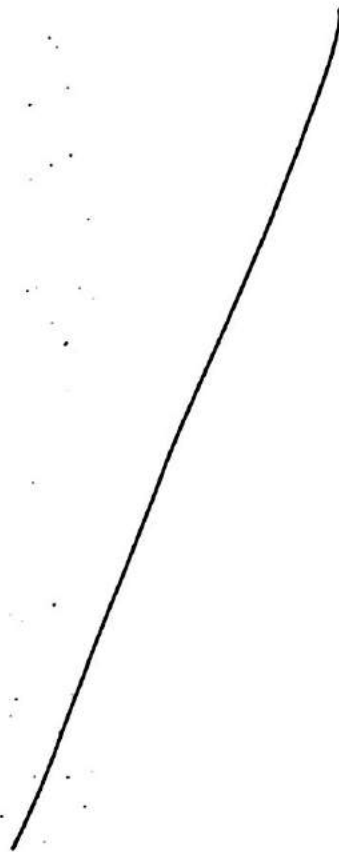
Recent push on the development of urban infrastructure under various optimistic missions such as smart cities plan or AMRUT ~~mission~~, though developmental needs to consider risk or vulnerability associated as well.

→ As seen recently in many untoward incidents or that it were mainly anthropogenic ~~st~~ reasons which aggravated the situation (of floods) due to lack of planned development or blind urbanization, increasing the pressure on resources and infrastructure.

→ Each region has its own geographical conditions, risks and vulnerabilities. ^{many} Each regions being prone to certain hazards should be kept in mind and development planned accordingly.

→ As seen recently in the Chennai floods, coastal encroachments and poor planning aggravated the situation. Rather if coastal regulation would have been proper keeping in mind the vulnerability ^{to} of floods due to NE monsoon in winters or tropical cyclones in late summer situation would have been not so damaging.

→ Way forward - Separate planning for different regions should be done with proper vulnerability Zonation and having the approach of "One Size fits All".



12. Explain how anthropogenic activities effect the intensity and magnitude of landslides. Discuss with special reference to impact of climate change on landslides in India.

व्याख्या कीजिए कि मानवीय गतिविधियाँ भूस्खलन की तीव्रता और परिमाण को कैसे प्रभावित करती हैं। भारत में भूस्खलनों पर जलवायु परिवर्तन के प्रभाव के विशेष संदर्भ के साथ चर्चा कीजिए।

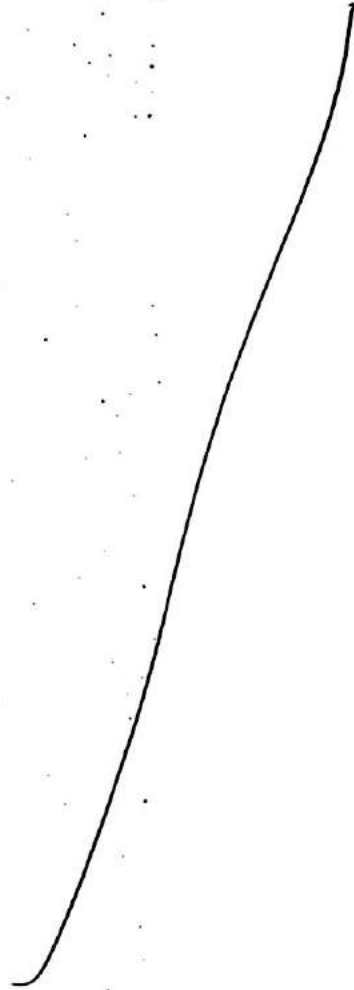
Landslides, a natural phenomenon, ~~of mass~~ a geomorphic process of mass movement becomes a major natural calamity due to various natural, incl anthropogenic reasons.

Anthropogenic activities effecting landslide intensity :

- (i) Developmental activities over the vulnerable areas like hilly terrain or not so strong base rock or in mountainous regions.
- (ii) Not adopting measures like building retention walls or terrace farming or retention nets, in vulnerable areas, hence landslides. ~~then occurring~~ causing blocking of rivers (causing floods) or roads and road

accidents.

(iii) Also the climate change
leading to global warming, increased
temperature (caused mainly
due to human activities)
leads to melting of glaciers
hence ^{water} acting as ^{an} agent of
~~causing~~ mass movement.



13. Discuss the impact of climate change on agriculture and food security in India. How are these aggravated during the times of disasters? Mention the steps that need to be taken in order to ensure adequate and affordable food supply for this impending crisis.

भारत में कृषि और खाद्य सुरक्षा पर जलवायु परिवर्तन के प्रभाव की चर्चा कीजिए। आपदाओं के दौरान इनसे संबंधित समस्याएँ किस प्रकार और अधिक बढ़ जाती हैं। इस आसन्न संकट के लिए पर्याप्त और वहनीय खाद्य आपूर्ति सुनिश्चित करने हेतु उठाए जाने वाले आवश्यक कदमों का उल्लेख कीजिए।

Impact of climate change on agriculture and food security :

- (i) Unpredictable rainfall, ~~for~~
~~disasters~~ can lead to loss
in productivity and hence
challenging food security
- (ii) Increased temperature can
encourage evaporation increasing
soil salinity and hampering
fertility.
- (iii) In absence of proper storage,
unpredictable weather event
can cause post harvest loss.
- (iv) Complete loss to the rainfed
agriculture without irrigation
facilities during dry years due to

climate change

During the times of disasters:-

- (i) Increased need of relief material to be supplied to affected region leading to increased demand and hence pressure on food security
- (ii) Production of that area affected which faces disaster.
- (iii) Events like drought or floods cause agricultural ^{output} loss ~~also~~ reducing purchasing power of farmers challenging their food security

~~Steps~~ Steps that can be taken:-

- (i) Improving cold storage facilities.
- ~~like and~~
(ii) Transportation facilities to transport the produce from one region to the region in crisis ~~like~~ to be improved, eg:-
refrigerated transport vans.

- (iii) Information dissemination to be improved to make the farmer aware of the ~~change~~ climatic situation
- (iv) Training for farmers to adopt best practices like proper choice of crop according to the conditions.
- (v) Improved infrastructure for providing irrigation facilities to currently ~~uncovered~~ rainfed regions (currently out of 141 Mn Ha Net Sown Area only ~ 63 Mn Ha under irrigation)
- (vi) Providing (disaster) drought resistant and high yielding seeds to farmers.
- (vii) Adopting various measures like those committed under COP21 so as to control global warming in turn climate change.

14. Discuss how drought is more of a man-made disaster than a mere deficiency of rainfall. Elaborate on the consequences of desertification that drought prone regions face. Also, bring out the preventive steps to be taken in light of targets to curb desertification as mentioned under the SDGs.

चर्चा कीजिए कि किस प्रकार सूखा केवल वर्षा की कमी से पैदा आपदा न हो कर मुख्य रूप से एक मानव-निर्मित आपदा है। सूखा प्रवण क्षेत्रों द्वारा सामना किए जाने वाले मरुस्थलीकरण के परिणामों को विस्तार से बताइए। साथ ही, मरुस्थलीकरण पर अंकुश लगाने के लिए SDGs के अंतर्गत उल्लिखित लक्ष्यों के प्रकाश में उठाए जाने वाले निवारक कदमों को स्पष्ट कीजिए।

~~Harmful consequence of drought
can be curbed as it is
not a disaster~~

Condition of drought is
aggravated due to man-made
reasons as the deficiency in
rainfall could be tackled
with effective water resource
management.

→ Blind use of water resources and
also activities leading to
pollution of resources ~~aggravate~~,
intensifies the situation.

→ Water bodies which are in

rainfall has been polluted or disappeared due to indiscriminate use and industrial effluents discharge. Eg:- Aral sea in central asia

→ Also the situation gets aggravated due to famine situation created during droughts due to lack of storage and transport facilities.

• Desertification is the phenomenon of desert expansion due to wind erosion of sand on the desert and its deposition in other areas.

Consequences of desertification

- (i) loss of fertile land in the adjoining areas due to ^{apparent} expansion of desert
- (ii) causing the rise in air pollution due to sand particles

suspended in air. ~~due to~~

iii) Damage to ecology of the nearby region.

Preventive steps that can be taken :-

- i) Building retention walls around desert boundary to prevent carrying of sand by wind
- ii) Planting of trees along the boundary of the desert which controls soil erosion hence desertification, Also it can keep drought prone areas or desert regions to retain moisture in the soil
- iii) Transverse farming :- Planting trees in direction perpendicular to wind direction.

15. What is the role of NDRF in managing disasters in the country? Highlighting the challenges that NDRF has been facing, discuss why it is still the armed forces which end up being the most visible force at hand during disasters.

देश में आपदाओं के प्रबंधन में NDRF की क्या भूमिका है? NDRF द्वारा सामना की जाती रही चुनौतियों पर प्रकाश डालते हुए चर्चा कीजिए कि आपदाओं के दौरान केवल सशस्त्र बल ही क्यों अभी भी सहज और सर्वाधिक उपलब्ध बल के रूप में दृष्टिगोचर होते हैं।

National Disaster Response Force, created under the Disaster Management Act, 2005. has the mandate to perform ^{search,} rescue and relief operations during the times of disasters.

Challenges faced by NDRF :-

(i) Lack of Manpower :- The occurrence of frequent disasters with large area getting affected ~~it~~ often seen lacking the force needed.

(ii) Resource Crunch :- Unlike army, NDRF doesn't possess state-of-the-art.

resources like that for transportation, evacuation, and etc.

(iii) Lack of autonomy - Army being the independent wing, away from government control can function effectively as compared to NDRF which is created under a statute

(iv) Army has too huge capacity to respond to the crisis situation whereas NDRF needs capacity building to effectively function

Hence, the role mandated for NDRF of search, rescue and rehabilitation, covering providing relief and essential commodities to the affected populace requires more resources, autonomy and capacity building to work effectively.

16. Give an account of the different types of earthquakes based on their zone of occurrence. Identify the earthquake prone regions of the world with special reference to India. Also explain the reasons for the occurrence of earthquakes in geologically inactive regions like Peninsular India.

घटित होने वाले क्षेत्र के आधार पर विभिन्न प्रकार के भूकंपों का विवरण प्रदान कीजिए। भारत के विशेष संदर्भ में विश्व के भूकंप प्रवण क्षेत्रों की पहचान कीजिए। साथ ही, प्रायद्वीपीय भारत जैसे भूवैज्ञानिक रूप से निष्क्रिय/स्थिर क्षेत्रों में भूकंपीय घटनाओं के कारणों की भी व्याख्या कीजिए।

Earthquake is the violent shaking of the earth's lithospheric surface due to apparent movement of tectonic plates.

→ Earthquakes can be classified depending on the zone of occurrence or rather position of its focus.

(i) Shallow focus EQ - If the focus of the EQ is in shallow depth then it causes is called shallow focus EQ, causing more destruction

(ii) Deep focus EQ - Focus is

deep inside the surface

(iii) ~~If the focus is~~

~~on oceanic crust~~

(ii) Focus below oceanic crust :-

If the focus of the EQ
is below oceanic crust

It can cause tsunami

→ EQ can also be classified
based on plate movement :-

(i) Convergence boundary :- If

plates move towards each
other (fold mountains are
formed)

(ii) Divergence boundary :- If plates

are moving away from each
other (fault formation)

(iii) Transverse Boundary :-

If plates move along their
sides (Transverse
faults formation)

→ EQ prone regions of the world :-

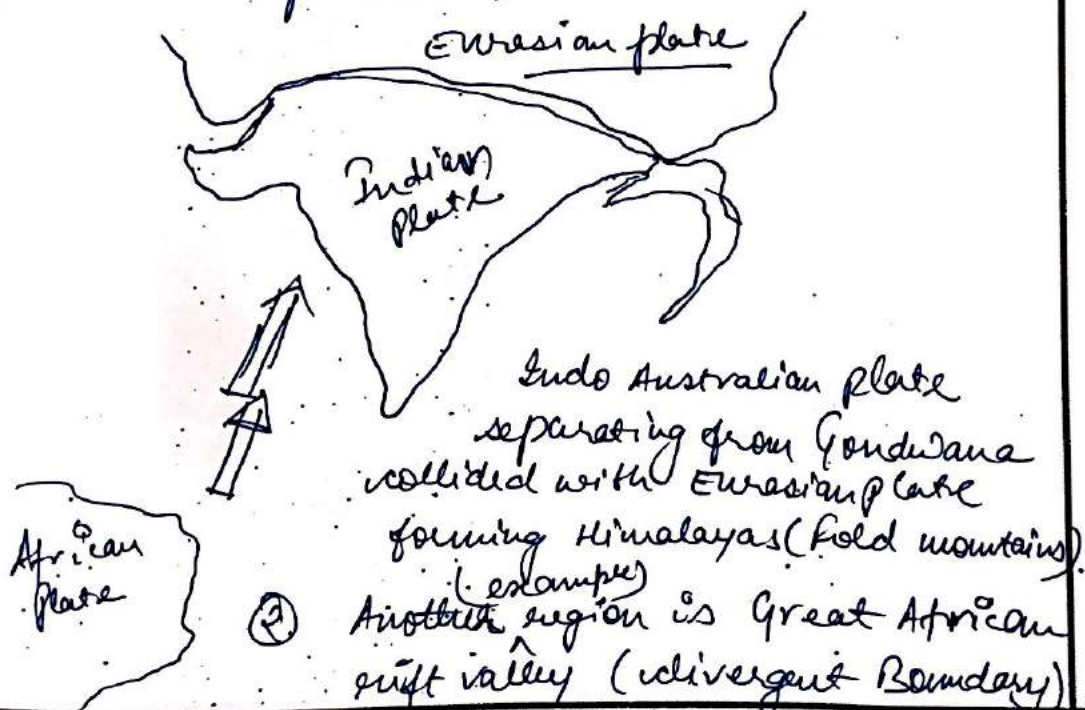
All the regions which occur
at plate boundaries are
EQ prone regions of the
worlds.

There are various

Eg:- Indian plate

Eg:- ① Himalayan region in India

is along the converging
boundary of two active plates -
Eurasian and Indo-Australian
plate.



17. Temperature, density and salinity are three most important physical properties of Ocean. Explain how these all are interdependent. Also examine the impact of climate change on these properties.

तापमान, घनत्व और लवणता महासागर के तीन सर्वाधिक महत्वपूर्ण भौतिक गुणधर्म हैं। व्याख्या कीजिए कि ये सभी किस प्रकार अन्योन्याश्रित हैं। साथ ही, इन गुणधर्मों पर जलवायु परिवर्तन के प्रभाव का भी परीक्षण कीजिए।

Temperature, density and salinity
are the properties of ocean water
which affect, water
movt., marine ecosystem,
navigation and many other
~~things~~ things.

Interdependence :-

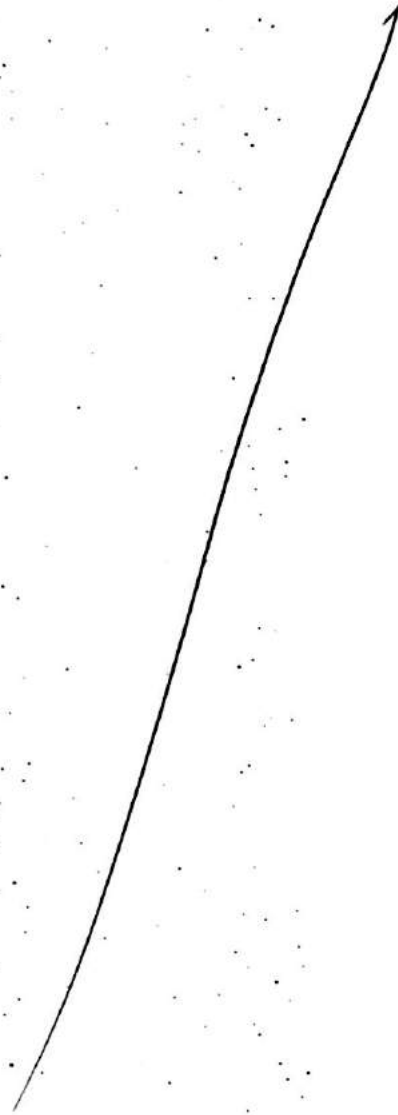
(i) Temp. & Density :- with
increasing temperature
density of water decreases.

(ii) Temp. & Salinity :- Increasing
temp. increases salt (holding)
dissolution capacity. Hence salinity
also due to evaporation.

(iii) Salinity & Density :- More
saline water is
more dense.

Impact of climate change on
these :-

- (i) Increased average sea surface temperature due to global warming (intense heating) increases salt dissolution capacity hence salinity also by increased evaporation.
- (ii) Melting of glaciers due to climate change adds more fresh water to the ocean hence having reducing salinity.
- (iii) Density changes in accordance with the net effective impact on salinity according to interdependence.



18. Critically discuss the effectiveness of initiatives such as "odd-even" and "Car free day" in coping up with the issue of urban air quality and traffic congestion.

शहरी वायु गुणवत्ता और यातायात संकुलन (भीड़-भाड़) जैसे मुद्दों का सामना करने में 'ऑड-ईवन' (सम-विषम) और 'कार फ्री डे' जैसी पहलों की प्रभावशीलता पर आलोचनात्मक चर्चा कीजिए।

Initiatives such as "odd-even" scheme and "car free day" have ~~both~~ ~~are~~ ~~effective~~ though slated to be effective have certain challenges and ~~loop~~ as well.

Pros:-

- (i) Reduced ^{vehicular} emission on certain days and hence reduced concentration of particulate matter in air
- (ii) Decongestion of traffic, which can have positive impact of reduced accidents
- (iii) Also traffic decongestion

would reduce delays ~~to~~ in metro cities like Delhi hence in a way increasing productivity.

Challenges or Inefficiencies:

(i) Lack of proper public transport facility.

(ii) Recent adoption by Delhi Government showed marginal benefit or at times ^{proving} not effective at all.

(iii) Can't be adopted as a continuing measure ~~as~~ as experienced by previously adopting cities like ^{the} Mexican city or Singapore

(iv) Other polluting sources at times have higher share

Way Forward: These kind of schemes can be used ~~in~~ along with other pollution controlling measures but the facility

and infrastructure of public
transport should be improved
first

19. Despite having large deposits of coal, we continue to import it for our domestic use. What are the challenges which we face in meeting our domestic demand? Do you think meeting the social commitments of our country would be challenging in light of our INDC commitments?

कोयले के विशाल भण्डार होने के बाद भी, हम अपने घरेलू उपयोग के लिए इसका आयात करते हैं। अपनी घरेलू मांग को पूरा करने में हम किन चुनौतियों का सामना करते हैं? क्या आप यह सोचते हैं कि हमारी INDC प्रतिबद्धताओं के प्रकाश में अपने देश की सामाजिक प्रतिबद्धताओं को पूरा करना चुनौतीपूर्ण होगा?

Challenges we face in meeting domestic demand :-

(i) Availability of large coal reserves but lack of high quality coking coals and peat coal used as coking coal in industries.

(ii) Lack of proper equipments (for underground mining) and infrastructure leading to increased mine hazards affecting production as well as risk to human life.

(iii) Lack of encouragement to private players to explore and mine from new reserves.

(iv) Increased political intervention and ~~scams~~ in corruption in coal block allocation.
Eg:- Coal Block Scam

(v) Ineffective in curbing coal mafia leading to production lost to theft or smuggling

→ India's International Nationally Determined Contributions (INDC) under Paris agreement target for emission reduction. ~~Through~~ these commitments focus on reducing the usage of fossil fuels (conventional) energy to reduce emissions.

For a developing country like India on a bright development path it can be a detriment to achieve growth targets as fossil fuels like coal are the major source of energy (thermal energy) for our industries.

But the challenge can be overcome by investing more in renewable energy sources like solar, wind, HEP as India has a huge potential in these.

20. Forest fires have become a regular feature during summers in the Western Himalayas. What are the causes behind this phenomenon? Critically examine the efforts made by authorities in countering this problem. Do periodic forest fires have any benefits associated with them?

पश्चिमी हिमालय में ग्रीष्म ऋतु के दौरान दावानल/वनाग्नि (फॉरेस्ट फायर) एक नियमित घटना बन गयी है। इस परिघटना के पीछे क्या कारण हैं? इस समस्या से निबटने के लिए प्राधिकरणों द्वारा किए गए प्रयासों का आलोचनात्मक परीक्षण कीजिए। क्या समय-समय पर होने वाली दानावल की घटनाओं के कुछ लाभ भी हैं?

Forest fires are the large scale burning of forest trees due to various reasons both natural and anthropogenic.

Causes:-

- (i) Increased summer temperature due to climate change & global warming
- (ii) Low rainfall in western Himalayas as moisture content of SW monsoon winds is almost lost ~~due to travel~~ from east to west

Q.6
(14)

~~Benefits associated with periodic
forest fires can be that~~

(1) ~~they can help~~

