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(To be filled by candidate)

Code : TC047

Name of Candidate : RAHUL HIJAM

Roll No. : GSPM23B13025

Registration Number : ..... Date of Examination : 30/6/23

Exam Centre : Old Rajinder Nagar ☑ Bhopal ☐ Online ☐

MTS - Sectional Length Test (Plus)-1 : 2023

GENERAL INSTRUCTIONS

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Candidates should attempt the questions strictly in accordance with the instructions specified in the question paper and in the space prescribed under each question in the booklet. Any answer written outside the space allotted may not be given credit.

Question paper will be provided separately and can be taken by the candidates after conclusion of the exam.

.....

SUBJECT/PAPER
GENERAL STUDIES

Invigilator's Sign. : .....


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Evaluator Code :

Q.No	Pg No.	Maximum Marks	Marks	Total
1	5			
2	7			
3	9			
4	11			
5	13			
6	15			
7	17			
8	19			
9	21			
10	23			
11	25			
12	28			
13	31			
14	34			
15	37			
16	40			
17	43			
18	46			
19	49			
20	52			
Grand Total				

Signature

MACRO COMMENTS

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2. Write your registration number and other particulars, in the space provided on the cover of QCA Booklet.
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5. If you wish to cancel any work, draw your pen through it or write "Cancelled" across it, otherwise it may be evaluated.
6. Handover your QCA Booklet personally to the invigilator before leaving the examination hall.

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Q.1 रूसी क्रांति को प्रभावित करने वाले कारक कौन–कौन से हैं तथा इस क्रांति के क्या–क्या परिणाम हैं ? भारतीय राष्ट्रीय आंदोलन पर इसके प्रभाव की विवेचना कीजिए। (150 शब्दों में उत्तर दीजिए) 10 अंक

What are the factors that led to the Russian revolution and what are the consequences of this revolution? Discuss its influence on the Indian national movement. (Answer in 150 words) 10 Marks

With the rise in competition due to various industrial revolution in Europe and America, and the occurrence of world war I, various events took place during the time period. Among such was Russian Revolution.

Factors leading to Russian Revolution

(1) Economic Reason : The steps taken by Czar Nicholas I to participate in world war led to financial crisis in the county.

(2) Social Reason : The workers in the country were in a ~~mean~~ miserable condition due to the financial crisis and starvation and hunger, exploitation was prevalent.

(3) Political Reason : The rule under Czar Nicolas I was not sensitive towards the masses and was silent in the matters concerning ~~solut~~ the plight.

(4) Role of Intellectuals : Various intellectuals lead the role in spreading awareness about the exploitation to the masses and bringing ~~communal~~ marxian ideology to the people.

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Consequences of the Revolution.

(1) While in other revolution, though working class participated, they were sidelined later. But here, the working class plays major role after the revolution.

(2) Ideology of communism was prevalent across the country.

(3) The concept of private property was replaced by public property with everyone getting according to their share.

Influence on Indian National Movement.

(1) The revolution lead to the realisation of fault lines in the European countries and revealing that Europe is not invincible.

(2) Many young revolutionaries were inspired by the idea of communism and led to various revolts including formation of HSRA.

(3) The CPI in India did not support Quit India movement as it was supporting Russia and communism.

Thus, not only the revolution affect Russia but its influence were seen in various parts of world including India.

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Q.2 स्वतंत्रता पश्चात् के भारत की पहचान विज्ञान और प्रौद्योगिकी के क्षेत्र में इसकी उल्लेखनीय प्रगति रही है। इस काल में हुए वैज्ञानिक विकास ने भारत को किस हद तक आधुनिकता के पथ पर अग्रसर किया?

(150 शब्दों में उत्तर दीजिए) 10 अंक

'The hallmark of post-Independent India has been its remarkable strides in science and technology'. To what extent did scientific development during this period put India on the path of modernity?

(Answer in 150 words) 10 marks

After Independence, India was in a natured condition due to the exploitations and partition. However, science and technology helped India in developing and striding on path of modernity.

Various Strides in Sciene and Technology

① Green Revolution : With the country plight with hunger and dependent on import, the use of HYV seeds lead of to self sufficiency.

② Nuclear Test : As the country started developing, the new step took place with the development of nuclear power and nuclear test. Thus becoming one of the nuclear state.

③ Space : With the development of rockets like PSLV, GSLV and indegenisation of rockets, India started becoming one of the top country in Space Mission.
Eg:- Mars orbital Mission.

Candidates must not write on this margin

(4) Biotechnology : The evolution in GM crops and adoption of BT cotton and further R&D is making the sector competitive in the world.

(5) Defence : India is now trying to make indigenous ~~the~~ defence equipments, ships and aircrafts. Eg:- Developments by HAL (light weight helicopter).

(6) AI and Nanotechnology : India is moving forward in AI and Nanotechnology sector also. with the development of chat GPT and Param and huge advancement in quantum computing, India is going along with the trend.

Therefore ~~to~~ India has positioned itself as one the the upcoming leader and major competitor in the world post-independence.

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Q.3 पृथ्वी की सतह पर तापमान के असमान वितरण के लिए उत्तरदायी विभिन्न कारकों की चर्चा कीजिए।

(150 शब्दों में उत्तर दीजिए) 10 अंक

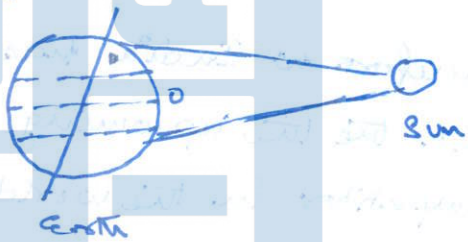
Discuss the various factors responsible for the uneven temperature distribution on Earth's surface.

(Answer in 150 words) 10 Marks

The Earth's surface has uneven temperature with some region cold, other hot & while some other region being dry.

Factors responsible for the uneven temperature are:

(1) Insolation of Sun : The angle in which the sun rays touches the earth surface plays a major role in determining the temperature.



(2) Various particulate matters in atmosphere.

The atmosphere consist of various particulate matter affecting in absorption of the reflected ray from ground.

(3) Upwelling of Ocean Current : The cold upwelling leads to dry area near western margin of continent while eastern margin of continent receives rain.

Candidates must not write on this margin

(4) Trade winds : The trade winds plays a major role in bringing clouds and rainfall thus affecting the temperature.

(5) ITCZ and Horse Latitude : The formation of low pressure near equator and formation of horse latitude due to air mass circulation also plays a role in distribution of temperature.

(6) Various other factors : Other factors like Ocean currents, El Nino, La Nina and Global warming also changes temperature.

This lead to various climate and temperature around the world.

E.g's (1) Amazon forest, Congo forest → Tropical Rainforest with rainfall whole year and temperature around 24-26°C.

(2) Taiga climate along Siberian Region with temperature below 0°C.

Thus, various factors leads to uneven distribution of temperature leading to various climatic region around the world.

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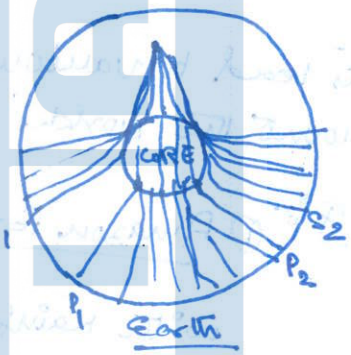
Q.4 पृथ्वी की आंतरिक संरचना की हमारी समझ में भूकंपीय अनुसंधान किस हद तक योगदान करता है? इसके महत्त्व का विस्तार से विश्लेषण कीजिए। (150 शब्दों में उत्तर दीजिए) 10 अंक

To what extent does seismic investigation contribute to our understanding of the Earth's interior structure? Analyze its significance in detail. (Answer in 150 words) 10 Marks

The interior structure of Earth is very deep and we cannot dig deep enough to understand it. But Seismic investigation helps in understanding it.

Seismic Waves are energy waves created due to sudden movement inside earth. These can be body wave or surface waves.

- Body wave
  - P waves
    - longitudinal wave
    - can travel both solid and liquid.
    - fast speed.
  - S-waves
    - transverse wave
    - can travel only solid
    - slower wave.

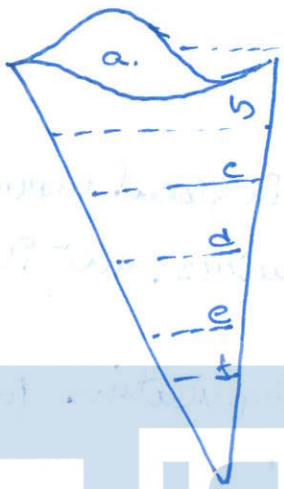


When P waves travels inside earth's interior structure, they are refracted due to difference in density. The P_1-P_2 region is called shadow zone of P-wave.

When S waves travels, they cannot pass through the core and are reflected. The S_1-S_2 region is called shadow zone of S-wave.

Candidates must not write on this margin

The change in speed due to difference in density inside Earth's interior is called line of discontinuity.



This discontinuity leads to identification of :

a) Conrad
b) Mohorovic
c) Lenguine
d) Repitite
e) Guttenberg
f) Oldham

Thus, the difference in speed and the refraction and reflection of s-wave and p-wave creating shadow zone helps in identifying the inner structure of the Earth.

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Q.5 जलवायु परिवर्तन के कारण हिमनदों के पिघलने का पारिस्थितिकी तंत्र और मानव समाज पर गंभीर प्रभाव पड़ता है। हिमनदों के पिघलने के कारण पर्यावरण पर पड़ने वाले प्रभावों और इस मुद्दे के समाधान के लिए किए जा सकने वाले उपायों पर चर्चा कीजिए। (150 शब्दों में उत्तर दीजिए) 10 अंक

The melting of glaciers due to climate change has serious implications for the ecosystem and human society. Discuss the effects of melting glaciers on the environment and the measures that can be taken to address this issue. (Answer in 150 words) 10 Marks

With the rise in global warming, there is rapid melting of glaciers. and it has serious implications.

Some of the implication for ecosystem and human society are :

(1) Rise in level of sea and ocean leading to submergence of continent.

(2) glacier melting leads to loss of habitat to many polar animals.

(3) It leads to uncertainty in areas weather condition causing and unpredictable rain and ~~grow~~ drought.

(4) It can cause disbalance in salinity and thermohaline circulation

(5) ~~Have~~ with disturbance in ocean currents, navigation becomes difficult. and

(6) Rise in Tsunamis and Super cyclone.

Candidates must not write on this margin

Measures to address the issue:

1. Implementation of proper protocols to follow in order to keep CO_2 level maintained.
2. Increase in plantation and decrease in deforestation.
3. Proper awareness among masses about the climate change
4. Shift towards renewable energy.
5. Less use of products which are emitting gases responsible for global warming.

~~Note~~

All the people must join hands together in order to come out of this situation and remember that "The Earth is One Family" i.e Vasudeva Kutumbakam.

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Q.6 श्वेत क्रांति भारत के पश्चिमी भाग में सर्वाधिक सफल रही। श्वेत क्रांति की इस क्षेत्रीय सफलता के कारकों की विवेचना कीजिए। (150 शब्दों में उत्तर दीजिए) 10 अंक

The White Revolution was most successful in the Western part of India. Discuss the factors for this regional success of the White Revolution. (Answer in 150 words) 10 Marks

White Revolution is the movement that brought change in the milk manufacturing industry.

It was successful in the western part of India due to following :

(1) The milk industry was situated in the western part. Eg :- AMUL in Gujarat.

(2) It was easy for implementation of the project as there were established industry and people are more specialised.

(3) The revolution aims at formalising the milk industry where there is proper distribution system and everyone is receiving milk. Since the infrastructure was well prepared in western part, it was a regional success.

(4) Operation Flood of Verghese Kurien was supported by AMUL and other regions was taking such industry.

Candidates must not write on this margin

Thus, the White Revolution was successful in western region inspiring other regions also in formalising various industries.

Candidates must not write on this margin

Q.7 कोयला आधारित विद्युत संयंत्रों से नवीकरणीय ऊर्जा उत्पादन की ओर गमन का संरचनात्मक परिवर्तन कोयला समृद्ध राज्यों में मानव विकास को कैसे प्रभावित करेगा? (150 शब्दों में उत्तर दीजिए) 10 अंक

How will the structural shift from coal-based power plants to renewable energy generation impact human development in coal-bearing states? (Answer in 150 words) 10 marks

There is need of time to change from coal based power plant to renewable energy generation with the rise in global warming.

However, it will have different impact on various aspects of society, mainly in Human development of coal bearing states.

(1) The coal bearing states mainly rely on coal as their resource for growth of the state.

(2) It is their form of employment, & industry and livelihood.

(3) If the shift happens abruptly, it will lead to rise in unemployment and reduce income of the state.

(4) Rise in hunger, Malnutrition and health issues

(5) Rise in riots, restlessness and anger as no one likes changes

Candidates must not write on this margin

However, if proper implementation of policies and gradual change takes place then,

(1) with proper awareness and availability of alternative jobs.

(2) Increase in outreach of government policies

(3) Rise in the infrastructure development,

the disadvantages caused can be reduced and remove and the state can move towards sustainable economy.

Thus, proper implementation of policies and inclusive growth is required for change.

Candidates must not write on this margin

Q.8 तापमान और वर्षण किस सीमा तक मृदा के गुणधर्मों को निर्धारित करने वाले सबसे महत्त्वपूर्ण कारक हैं?

(150 शब्दों में उत्तर दीजिए) 10 अंक

To what extent temperature and precipitation are the most important factors that determine soil properties?

(Answer in 150 words) 10 marks

Soil is the uppermost part of Earth's lithosphere. There are various types of soil according to climatic ~~Heavy~~ region.

Temperature and Precipitation plays a huge role in following ways -

(1) Alluvial soil → Formed by river deposits. It is found in northern plains of India where there is proper monsoon

(2) Black soil → Found in Deccan Plateau region due to volcanic eruptions and rise in temperature.

(3) Red Soil → found in areas where there is low rainfall and high temperature.

(4) Laterite soil → found in region where there is heavy rainfall and thus due to ~~water~~ it it is acidic.

(5) Regur Soil → found in ~~a~~ coastal area where there is more salt.

Candidates must not write on this margin

Thus different property of soil can be determined by different variety of temperature and precipitation -

Candidates must not write on this margin

Q.9 अरब सागर में प्रचंड और तीव्र चक्रवात एक नियमित घटना क्यों बनते जा रहे हैं? उदाहरणों सहित सिद्ध कीजिए।
(150 शब्दों में उत्तर दीजिए) 10 अंक

Why are severe and intense cyclones becoming a regular phenomenon in the Arabian Sea? Substantiate with examples.
(Answer in 150 words) 10 marks

Cyclones are eastastropic storm formed due to presence of low pressure above ocean water.

Severe and intense cyclones are becoming regular in ~~becaus~~ Arabian Sea because:

(1) Rise in temparature due to global warming,

(2) Increase in intensity of Eastern Jet stream which led to diverging the path of cyclone towards Arabian Sea.

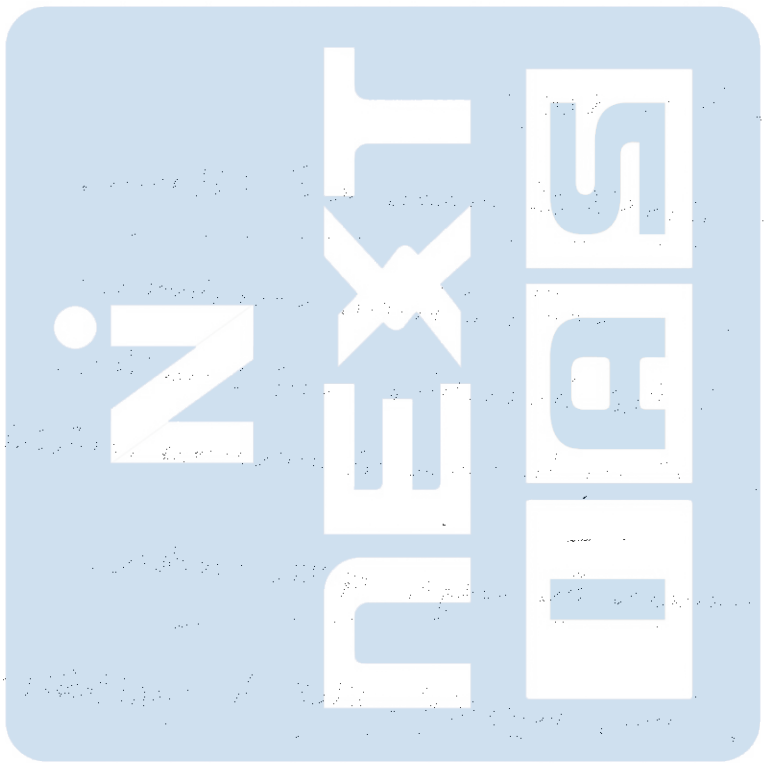
(3) The rise in temparature intensifies low pressure area and also makes more evaporation

(4) The trade winds which changes the directions are changing due to chnge in pressure.

This can be seen with the recent occurance of cyclone Biparjoy and this with changing environmental impacts,

The cyclones are becoming stronger and changing direction.

Candidates must not write on this margin



Candidates must not write on this margin

Q.10 इंग्लैंड की औद्योगिक क्रांति ने न केवल आर्थिक परिदृश्य को बदल दिया बल्कि इसके दूरगामी सामाजिक और सांस्कृतिक प्रभाव भी पड़े। विवेचना कीजिए। (150 शब्दों में उत्तर दीजिए) 10 अंक

'England's Industrial Revolution not only transformed the economic landscape but also had far-reaching social and cultural impacts'. Discuss. (Answer in 150 words) 10 marks

The Industrial Revolution in England does not transformed economic landscape only. It had social and cultural impacts too

Some of them are:

(1) Rise in status of women and children

The women and children now started working in the industries while earlier they are mainly involved in household activities.

(2) The increase in wage of the workers.

(3) Turning from feudalistic state to capitalist mindset

(4) Increase in Research and Development for increasing inventions to ease doing business.

Candidates must not write on this margin

(5) The monarchy system was replaced by parliamentarian system.

(6) The impact was also seen in the dresses & and way of living of people.

Thus it changes peoples' mindset and way of living, perception of society and economic status in Britain.

Candidates must not write on this margin

Q.11 स्वतंत्रता पश्चात् भारत को कई युद्ध लड़ने के लिए विवश किया गया था। हमारे द्विपक्षीय संबंधों पर भारत–पाक और भारत–चीन युद्धों के कारणों और प्रभावों पर प्रकाश डालिए। (250 शब्दों में उत्तर दीजिए) 15 अंक

India was forced into numerous wars post Independence. Highlight the causes and impact of the Indo-Pak and Indo-China wars on our bilateral relationships. (Answer in 250 words) 15 Marks

As India was healing post Independence from the partition and exploitation during British rule, ~~it~~ India also faces various challenges including multiple wars.

Indo-Pak Wars.

The reason of Indo Pak Wars are:

(1) During process of integration, the integration of Junagadh and Hyderabad into India led to Pakistan's feeling of enmity.

(2) Signing of Instrument of Accession further created fuel in burning with signing of instrument of Accession, Kashmir was asking for help when Pakistan with the help of Afghan tribals, raided and attack Kashmir.

(3) The idea of Pakistan that India is in a weak state since it was appealing for peace and Panchsheel policy.

Candidates must not write on this margin

4) The second Indo Pak war was due to exploitation of East Pakistan by West Pakistan.

5) Also, the disagreement regarding borders and territories in LOC and Kargil led to Kargil war.

India-China war.

The reasons for cause of the war were:

1) Boundary Dispute along the McMohan line.
2) Betrayal of Panchseel Policy by China.
3) Attack on strategic locations in Indian Border.

Impact of the war.

1) Many lives were lost during the war.
2) Increased rise in food price and and subsequent drought leads to more inflation.
3) Increase in malnutrition among children.
4) Famine was prevalent.
5) The creation of LOC and LAC along borders of Jammu and Kashmir.

Candidates must not write on this margin

Impact on Bilateral Relationship.

(1) Increase in proxy war ~~after~~ post war.

(2) Trade with Pakistan become less or and lesser

(3) Distrust between the countries increases.

(4) There is ongoing border dispute with China till today. Eg:- Doklam Crisis and encroachment in Arunachal Pradesh, Galwan Valley Battle etc.

(5) However trade with China is still dominant as India is dependent on China for various resources and China finds huge market in India.

India is now trying to rebuild the relation by establishing talks, increasing the connection, and trade keeping in mind sovereignty of the country.

Candidates must not write on this margin

Q.12 'आर्थिक रूप से सर्वाधिक सक्रिय गलियारे (कॉरिडोर) आज भारत में पूर्व हरित क्रांति क्षेत्रों के साथ अतिव्यापित करते हैं'। स्वतंत्रता पश्चात् के भारत के संदर्भ में हरित क्रांति ने भारत में किस प्रकार कृषि उत्पादकता में योगदान दिया है, लेकिन पीछे मुड़कर देखने पर लगता है कि इसने असमान विकास के भूगोल को जन्म दिया?

(250 शब्दों में उत्तर दीजिए) 15 अंक

'The most economically active corridors today overlap with the former green revolution regions in India'. In the context of post-independent India how has Green Revolution in India contributed to agricultural productivity but in hindsight produced a geography of uneven development?

(Answer in 250 words) 15 Marks

The dependency on import for survival post-~~indepen~~ independence was removed with the help of Green Revolution creating India as a self sufficient country.

Green ~~Revolu~~ Revolution is the process of using high yielding variety seeds in Punjab, Haryana and western Uttar Pradesh in order to yield more crop (rice and wheat) and increase productivity.

Contribution of Green Revolution

(1) The HYV seeds increases the productivity of rice and wheat.

(2) Increase in irrigation facilities.

(3) Use of modern inputs in the field.

(4) Reduction in imports and rise in exports.

However, the rise in productivity in certain regions led to an uneven development in the country.

Candidates must not write on this margin

(1) The trend of monoculture started leading to various externalities like:

(a) Loss of fertility of soil

(b) Heavy use of fertilisers

(c) Heavy use of electricity for irrigation.

(2) The area suitable for particular crop are not planting that crop due to huge MSP available to Rice and wheat.

(3) Increased in industrialisation only in parts of Green Revolution with macadamized roads and markets.

(4) Crop Diversity and Mixed cropping declines and productivity also reduces.

(5) Dependency for other crops like pulses and oilseeds

(6) Farmer's income also is different among various regions.

(7) Manufacturing industry was not rising as all the people are involved in agriculture.

Candidates must not write on this margin

The government is trying to reduce the uneven development with following measures.

(1) MSP increase in oil seeds and pulses

(2) PM PRANAM → use of natural fertilisers.

(3) Encouraging plantation of millets etc.

Thus, while the Green Revolution increases agricultural productivity, it was not even in whole country and lead to increase in gap between the people.

Candidates must not write on this margin

Q.13 प्रथम विश्व युद्ध की घटनाओं और उसके तत्काल बाद की घटनाओं ने अफ्रीका और एशिया में राष्ट्रवाद के पुनरुत्थान को किस तरह से बढ़ावा दिया? (250 शब्दों में उत्तर दीजिए) 15 अंक

In what ways did the events of World War I and its immediate aftermath foster the resurgence of nationalism in Africa and Asia? (Answer in 250 words) 15 Marks

Africa and Asia were colonised by the European and were exploited for the natural resources and labour.

The events of world war I and its immediate aftermath brings more nationalism in the people. Some of them are:

(1) With the defeat of Russia by Japan and crisis in Ottoman Empire, the perception was clear that Europe was not invincible.

This lead to the rise in nationalism and movement for freedom. The people started revolting more.

(2) The Russian Revolution lead to rise of many communist countries around the world with the marxian ideology in their mindset.

(3) After the loss of Germany in world war, various regions in Africa were free from hands of Germany. This also lead to rise in many leaders in Africa exposing the exploitation to the masses.

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(4) The treaty of Versailles created ~~a~~ rift between the European countries further weaking them.

(5) The League of Nation was already weak with members not following the treaty.

(6) Rise in Nazism and Fasism in Germany and Italy further weakens the European countries.

(7) The Great Depression also add to the woes of the europeans.

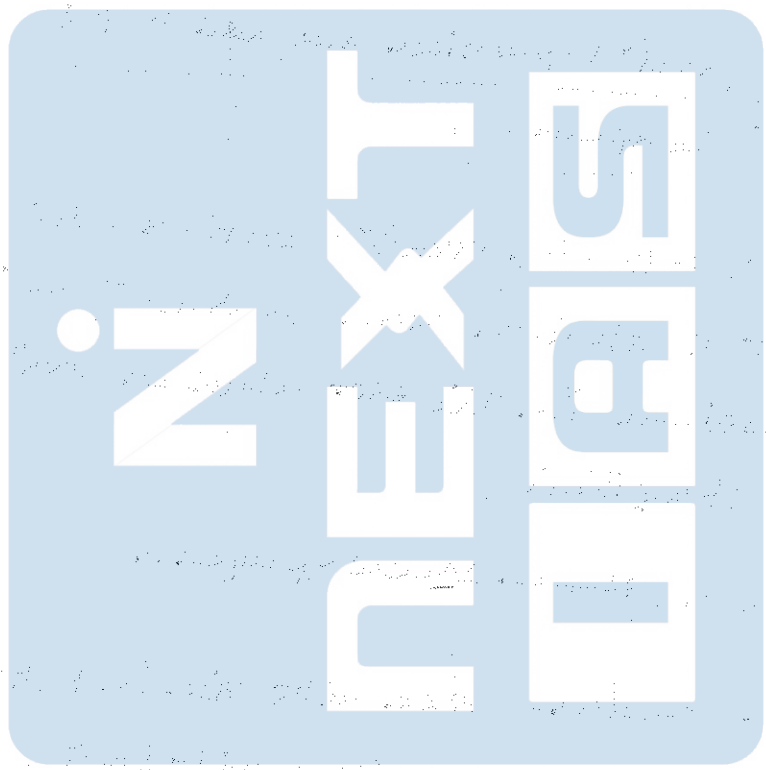
With the following events occuring, the strength of colonisers were weakened and the nationalism in the colonised countries further strengthens.

~~In Africa, Nelson Mandela played a~~

Various leaders rose with rise in Nationalism like China became communist state, in India, creation of HSRA, CPI etc.

It introduced a new zeal among masses and created increased in participation in freedom stugle movement.

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Q.14 महासागरीय नितल का विन्यास उन भूगर्भीय प्रक्रियाओं के बारे में आवश्यक जानकारी प्रदान करता है जिन्होंने पृथ्वी की सतह को आकार दिया है। महासागरीय नितल की प्रमुख विशेषताओं और समुद्र विज्ञान के अध्ययन में उनके महत्त्व की चर्चा कीजिए। (250 शब्दों में उत्तर दीजिए) 15 अंक

The configuration of the ocean floor provides essential information about the geological processes that have shaped the Earth's surface. Discuss the major features of the ocean floor and their significance in the study of oceanography. (Answer in 250 words) 15 Marks

Various Studies had been conducted and various theories were popularised to provide information about the geological process that shaped Earth's surface.

The oceanic surface played major role in Theory such as Convectional Current Theory, Sea floor spreading Theory and Plate tectonic theory.

The distribution of Ocean can be into:

(1) Continental Shelf.
(2) Continental Slope
(3) Continental Rise.
(4) Abyssal Plain.

The Abyssal Plain or deep sea is where major geographic features are present such as ridges, ocean mountains, Knolls, guyots etc.

The continental shelf is the extension of continent towards sea. It ranges upto 200 m and about 75 km width.

The continental slope creates an angle of about 3°-5° (sometimes 20°-25°) towards

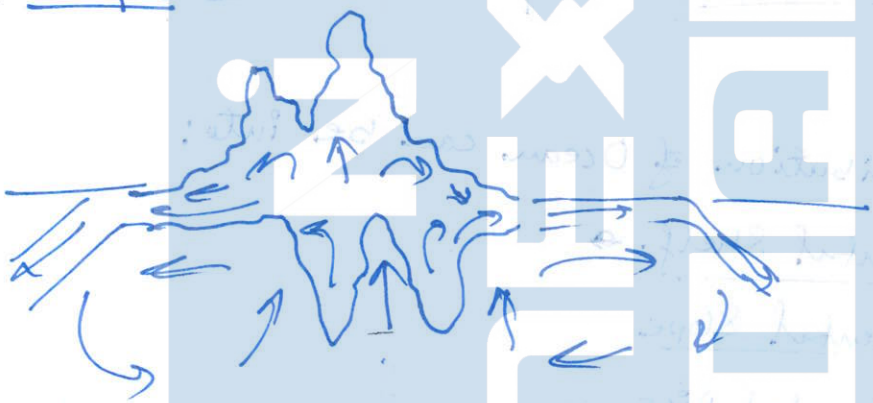
Candidates must not write on this margin

Ocean and is an erosional feature.

The continental rise is the depositional feature due to sediments of both ocean and continents.

After this, is the deep sea and trenches.

The hot magma inside the earth's interior when reached critical point transfers heat convectionally. when it rises through faults, it leads to creation of ridges.



The hot mantle plume also creates tension creating rift valleys. when it cools and form lateral plume, it helps in sea floor spreading and acts as conveyor belt. This leads to downward movement of floor through trenches further melting the sediments and continuing the cycle.

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This was evident with the concept of Convectional Current Theory Seafloor Spreading and Plate Tectonic Theory.

The creation of ridges and emption of mantle plume creates convergent plates and divergent plates leading to earthquakes, volcanoes and formation of islands.

~~Thus the~~

The convergence and divergence also leads to formation of mountain ranges, guyots, knolls and ocean mounts.



Thus the various features helps in study of geological structure and oceanography.

Candidates must not write on this margin

Q.15 भारतीय मानसून विभिन्न जलवायविक कारकों से प्रभावित एक जटिल परिघटना है। भारत में मानसूनी वर्षा की तीव्रता और वितरण के निर्धारण में महासागरीय और वायुमंडलीय कारकों की भूमिका का आलोचनात्मक परीक्षण कीजिए।

(250 शब्दों में उत्तर दीजिए) 15 अंक

The Indian monsoon is a complex phenomenon influenced by various climatic factors. Critically examine the role of oceanic and atmospheric factors in determining the intensity and distribution of monsoon rainfall in India.

(Answer in 250 words) 15 Marks

Indian monsoon is the reversal of seasonal winds. However, various climatic factors also played a crucial role in determining the intensity of rainfall.

Various atmospheric and oceanic factors.

(1) Trade winds : The trade winds flows from high pressure area to low pressure area causing rainfall in low pressure area.

(2) Westerly Jetstream (SWJT) → The shift of ITCZ during summer season (June - Oct) leads to shift of Westerly Jetstream towards Tibet-Plateau creating required condition for monsoon.

(3) Role of Tibet Plateau → The formation of Easterly Jetstream (EJT). also helps in diverting the moisture.

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(4) Role of El Nino & La Nina. : When there is El Nino, it creates rise in temperature in Peru coast leading to ~~more~~ less moisture in ~~Aus~~ Australian coast and South China sea. This helps bring ~~more~~ less moisture in Indian Ocean. causing less rainfall.

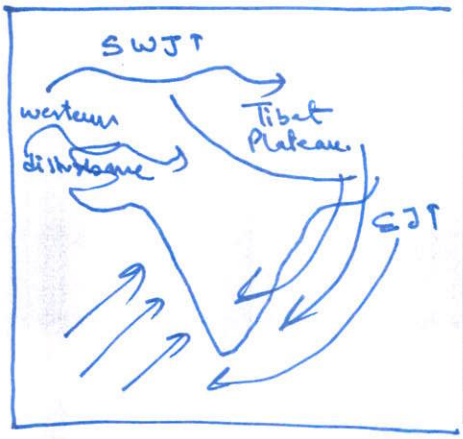
La Nina creates cold upwelling intensifying it leading to more moisture and more rainfall.

(5) Indian Ocean Dipole (IOD) creates high pressure and low pressure area in ~~Somalian region~~ and ~~Indian~~ ~~R~~ O west and East margin of Indian Ocean creating difference in pressure. Positive IOD creates more rainfall in India. and Negative IOD creates less rainfall.

(6) Madden Julian Oscillation creating low pressure area in ~~the~~ equatorial region.

Thus the different factors creates difference in intensity and distribution of rainfall.

Some of the effects are :



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(1) El Nino reduces ~~to~~ monsoon and brings drought but if there is presence of positive IOD, it can cancel the effect of El Nino.

(2) La Nina increases intensity of monsoon but negative IOD can cancel its impact.

(3) Presence of triple dip La Nina can cause more rainfall like these past years.

(4) The presence of Mountains ~~to~~ obstructs the trade winds and causes rain shadow effect in Leeward side creating less rainfall.

(5) Western Disturbances can create winter rainfall in Northern India.

Therefore, ~~we can~~ Monsoon is a complex phenomena impacted by various climatic factors.

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Q.16 तापमान व्युत्क्रमण वायुमंडलीय दशाओं को कैसे प्रभावित करता है और स्थानीय मौसम प्रतिरूप और वायु प्रदूषण स्तरों के लिए इसके क्या निहितार्थ हैं? (250 शब्दों में उत्तर दीजिए) 15 अंक

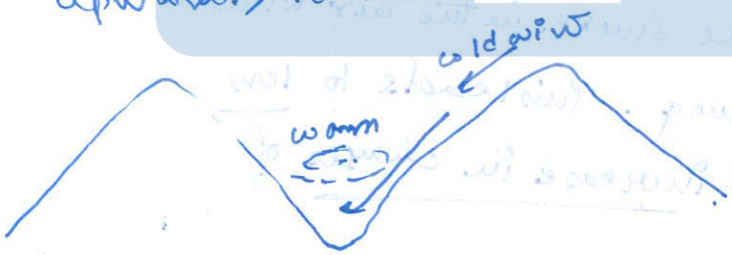
How does temperature inversion affect atmospheric conditions and what are its implications for local weather patterns and air pollution levels? (Answer in 250 words) 15 Marks

Temperature reduces with increase in height at the rate of 6°/km. This is called lapse rate. But when temperature increases with height it is called temperature inversion.

Causes:

1) Radiational ~~adve~~ inversion : When there is presence of high radiation reflected from the ground, it leads to cooling of ground and rise of temperature in air. It happens when there is clear sky, less wind and stable atmosphere.

2) Orogenesis : When cold wind from mountain moves down and moves the ~~wate~~ warm air upwards, it leads to temperature inversion.



3) Frontogenesis : When a cold front and warm front interacts leading to rise of warm front.



Candidates must not write on this margin

Atmospheric Condition.

Temperature inversion leads to :

(1) High pressure on ground due to presence of cold air.

(2) Rise in particulate matters in the atmosphere due to less wind.

(3) Clear sky as there is no formation of cloud.

(4) Rise in temperature due to presence of warm wind in atmosphere.

Implication on Local Weather Pattern and Pollution

(1) It leads to rise in pollution level as the particulate matter traps the pollutants and stable weather do not disperse it.

(2) In winter, the smoke in the air with fog leads to smog. This leads to less visibility and increase in chances of accident.

(3) The economic activities can also be delayed due to decrease in visibility and more traffic.

(4) Less clouds leads to less rainfall and increase in probability of drought.

Candidates must not write on this margin

(5) The rise in level of CO_2, CO, NOx and SO_2 can lead to increase in global warming creating further amplification in climate change.

Thus, temperature inversion as a phenomenon impacts local weather, pollution and personal life.

Candidates must not write on this margin

Q.17 दुर्लभ पृथ्वी तत्त्वों (दुर्लभ मृदा धातुएँ) की बढ़ती माँग के साथ, उनका वितरण वैश्विक अर्थव्यवस्था का एक महत्त्वपूर्ण पहलू बन गया है। वैश्विक स्तर पर दुर्लभ पृथ्वी तत्त्वों के वितरण, उनके उपयोग और उनके निष्कर्षण के पर्यावरणीय प्रभावों पर चर्चा कीजिए। (250 शब्दों में उत्तर दीजिए) 15 अंक

With the growing demand for rare earth elements, their distribution has become a critical aspect of the global economy. Discuss the distribution of rare earth elements across the world, their uses, and the environmental impact of their extraction. (Answer in 250 words) 15 Marks



Rare earth Material are groups of ~~elements~~ 17 elements comprising of lanthanides, yttrium etc. The rise in demand of Rare Earth Elements (REE) makes the distribution a critical aspect in global economy.

Some of the regions where REE are found are:

(1) North America → In area of Canadian Shield, Applachian Mountain and near Great Lakes

(2) South America : Bolivia, Argentina and Chile are known as Lithium Triangle. Also there is rich in REE in parts of Venezuela, Brazil and Paraguay.

Candidates must not write on this margin

(3) African : The lower part of Africa including Congo, Kenya, South Africa has ~~had~~ reserves of REE.

(4) Europe has comparatively lesser REE as they are dispersed all over France, Norway, Russia etc.

(5) Asia : China has the highest reserve of REE. India has reserves and with new found Lithium reserve in Jammu and Kashmir, it has became of one of the highest reserve country.

Uses

(1) Use in manufacturing of Semi conductors.

(2) Use in manufacturing of batteries.

(3) With rise in usage of solar energy, the manufacturing of photovoltaic cells also uses REE.

(4) The increase in new technology and quantum computing also needed REE for construction of required material.

(5) ~~REE like~~ Rise in use of e-vehicles also makes the demand more higher.

Candidates must not write on this margin

Environmental Impacts

(1) The finding of reserves does not mean it is ready to be extracted and use. Without proper technology it can disbalance the ecosystem.

(2) It can lead of to land subsidence, earthquake, landslide and many other disasters.

(3) Loss of habitats of wildlife, flora and fauna due to extraction.

(4) ~~Loss of~~ Displacement of people and rehabilitation can cause rise in deforestation.

Thus, proper technology, implementation of proper safeguard measures and readily available mitigation measures are required while extracting REE.

Candidates must not write on this margin

Q.18 चीनी उद्योग की अवस्थिति को प्रभावित करने वाले भौगोलिक और आर्थिक कारक कौन–कौन से हैं, और वे भारत और विश्व के विभिन्न भागों में इस उद्योग के विकास में किस प्रकार योगदान करते हैं?

(250 शब्दों में उत्तर दीजिए) 15 अंक

What are the geographical and economic factors that influence the location of the sugar industry, and how do they contribute to the growth of the industry in India and different parts of the world?

(Answer in 250 words) 15 Marks

Sugar industry is becoming one of the major industry in the world with the rise in demand.

Sugar cane needs water to grow and thus they are grown in climate with high water absorption capacity and temperature of around 22-26°C.

Geographical and Economic factor for location of Sugar industry:

(1) Climate: Proper availability of water is required with proper atmosphere for their growth.

(2) Market: Since sugarcane cannot be stored for long, market should be near.

(3) Transport: The transport facilities must be easily available for transportation of raw materials and finished goods

(4) Labour → Availability of labour plays a major role.

(5) Demand: The industry mainly is near where there is huge demand.

Candidates must not write on this margin

Contribution of Sugar Industry:-

(1) In India, Sugar Mills are mainly in South India. where there is black soil with high water absorption capacity. It leads to:

(a) Increase in export of sugar around the world.

(b) Employment increases thus causing rise in growth of GDP.

(c) The industry ~~was~~ also boom with the proximity to ports. It increases the avenues of business with port industry booming.

(d) The transportation sector i.e. roadways and railways also get benefited.

(e) ~~Loss~~ Rise in production thus leads to rise in employment and growth.

(2) The Sugar Production mainly is in Northern India. This causes more supply of raw material to Mills in increase in infrastructure and connectivity.

Candidates must not write on this margin

(3) Around the world, Brazil is the highest producer of sugar. It is making the economy grow with the export.

(4) The Sugarcane - by product is also used in making ethanol and helps in the use of ethanol as fuel.

(5) Torrefication ~~and~~ & and Palletisation of used sugarcane can also help in reducing pollution.

Thus the sugar industry helps in growth of industry, economy and environment.

Candidates must not write on this margin

Q.19 पहाड़ी राज्यों में पर्यटन, इस क्षेत्र की पारिस्थितिक वहन क्षमता से अधिक हो जाने का खतरा है। इस प्रवृत्ति के लिए योगदान करने वाले कारकों का विश्लेषण कीजिए और इस घटना के संभावित पर्यावरणीय प्रभावों का मूल्यांकन कीजिए। इन राज्यों में धारणीय पर्यटन को सुनिश्चित करने के लिए क्या उपाय किए जा सकते हैं?

(250 शब्दों में उत्तर दीजिए) 15 अंक

Tourism in the hilly states is threatening to exceed the ecological carrying capacity of the region. Analyze the factors contributing to this trend and evaluate the potential Environmental impacts of this phenomenon. What measures can be taken to ensure sustainable tourism in these states?

(Answer in 250 words) 15 Marks

Tourism sector is one of the most valuable sector which can increase country's growth, and reduce current account deficit. It can also act as soft power.

However, there is various threats due to excess of tourism :

1) The recent land subsidence in Uttarakhand and flash flood in Kedarnath, the increase in landslides in hilly region, these all shows the vulnerability of the hilly region if ecological carrying capacity is exceeded.

2) With the rise in tourism, there is increase in hotels and restaurants construction. If the proper evaluation of land structure is not done, it can lead to landslide, earthquake etc.

Candidates must not write on this margin

(3) The increase in infrastructure like road construction can also lead to imbalancing of sensitive areas.

(4) With rising footfall, there is rise in demand of services which lead to deforestation, increase use of plastics and more carbon foot print.

(5) ~~The~~ To supply the required energy, there is increase in power plants which can destabilize the environment.

~~Thus~~

Measures which can be taken are:

(1) 1. Diversifying the tourism destination by creating more spots.

Eg:- Vibrant Village Programme.

(2) Proper Environmental Impact Assessment before construction.

(3) Proper mitigation strategy readily available if disaster occurs.

Candidates must not write on this margin

(4) Awareness among people to use environmental friendly resources.

(5) Proper regulations for timings of visit.

Eg:- Restriction during rainfall region ~~during~~ where landslides are preominent.

Thus, though tourism is a huge sector, proper mechanism should be adopted to support sustainable tourism.

Candidates must not write on this margin

Q.20 भारत में मैंग्रोव वनस्पति के लिए उत्तरदायी भौगोलिक कारक कौन–कौन से हैं? जलवायु परिवर्तन भारत में मैंग्रोव वनस्पति के लिए कैसे खतरा पैदा कर रहा है? (250 शब्दों में उत्तर दीजिए) 15 अंक

What are the geographical factors responsible for mangrove vegetation in India? How does climate change pose a threat to mangrove vegetation in India? (Answer in 250 words) 15 Marks

Mangroves are very important vegetation which helps in balancing ecosystem and ~~mitigat~~ reducing disasters.

Geographical factors responsible for mangrove vegetation are:

(1) Deltaic area: Area where river meet ocean and form delta creates a great ecotone for mangrove plantation.
Eg: Sundarbans.

(2) Shallow water: Mangroves mainly grows in shallow brine water.

(3) Salinity is moderate: If the salinity increases, mangroves cannot survive.

(IV) Mangroves plays a major role in following ways

(1) It increases ecosystem by increasing marine ecosystem.

(2) It binds its roots with the mud, thus there is less erosion

Candidates must not write on this margin

(3) It makes impacts of cyclones and tsunamis less by acting as barriers.

(4) It helps in increasing ecological carrying capacity.

However, climate change poses a threat to Mangrove vegetation

(1) Global warming leads to rise in water level of Ocean.

(2) Increase in salinity of water due to climate change is bad for mangrove as it can only grow in certain limit.

(3) Frequent change in temperature causes imbalance in the climatic condition.

(4) With the rivers drying, ecotones are becoming lesser.

Thus, Various steps taken by Government.

(1) MISHTI Project to increase mangrove Plantation.

Candidates must not write on this margin

(2) Mangrove Alliance formed in COP-27 for protection of Mangrove.

Thus, keeping in mind the advantages of mangrove plantation, proper measures must be taken to increase its vegetation.

Candidates must not write on this margin

Rough Work