GSSCORE

An Institute for Civil Services

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TEST COPY

CHANDRAKANT BAGORIA

AIR - 75

(CSE 2022)

GEOGRAPHY OPTIONAL

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GS SCORE

Geography Test Series 2022

TEST - 02

127

GEOGRAPHY

Time Allowed: 3 Hrs. *Max. Marks: 250*

Instructions to Candidate

- Please read each of the following instructions carefully before attempting questions.
- There are EIGHT questions divided into TWO SECTIONS and printed in ENGLISH.
- The candidate has to attempt FIVE questions in all.
- Question Nos. 1 and 5 are compulsory and out of the remaining, THREE are to be attempted by choosing at least ONE question from each Section.
- The number of marks carried by a question/part is indicated against it.
- 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 a medium other than the authorized one.
- Word limit in questions, wherever specified, should be adhered to.
- Illustrate your answers with suitable sketches/maps and diagrams, wherever considered necessary. These shall be drawn in the space provided for answering the question itself.
- Attempts of questions shall be counted in sequential order. Unless struck off, the attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the Question-cum-Answer Booklet must be clearly struck off.

Name CHANDRAKANT

Mobile No _____

1. *Invigilator's Signature* _____ *Date* _____

2. *Invigilator's Signature* _____ *Signature* Chandrakant

Roll No. 71940

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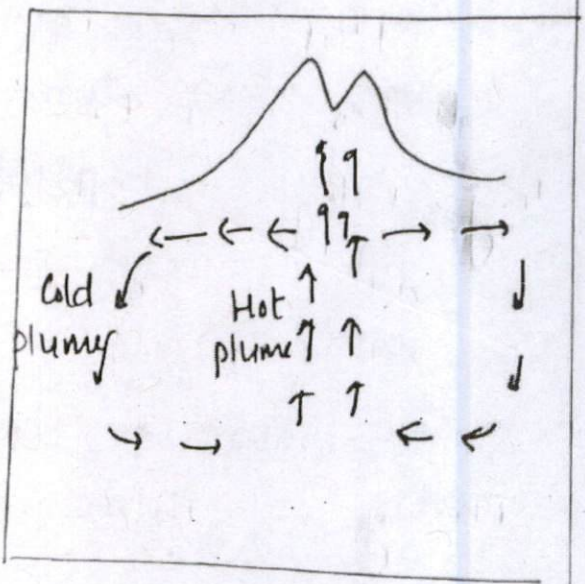
Section - A

1. (a) Write a short note on convectional current theory of Arthur holmes in context to geosynclinal formation. (150 Words) (10)

Convectional current theory of Arther Holmes provides an important driving mechanism for movement of lava inside earth's crust.

Their introduction.

Geosynclines are the geological troughs where sedimentation occurs and due to convectinal currents, formation of mountain occurs.



4.5

The lava is driven by convection current in conveyor belt fashion.

This theory also gives plusible mechanism of forcing the plates in

Remarks

4 mention how these convectional current theory helps in Interconnecting views for geosynclinal formation.

plate tectonics theory.

The idea of convectional current as driving force for mountain building is also taken by wegener in his continental drift (modified in 1929).

However, there have been certain shortcomings too :-

e.g. why hot plume and cold plume, occur at their respective places, has not been well explained.

However, convectional current theory of Holmes complemented the theories of origin of mountain.

fair conclusion.

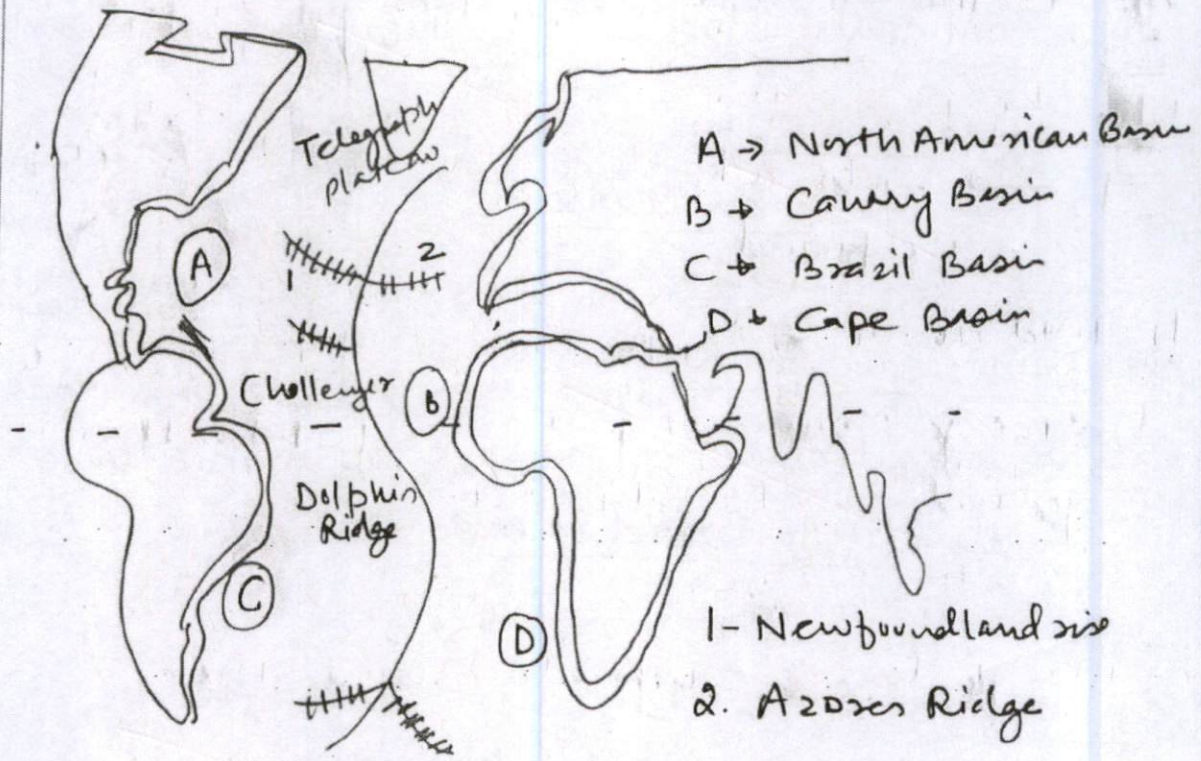
Remarks

1. (b) Ocean bottom relief of Atlantic Ocean (150 Words) (10)

Atlantic Ocean is a 'S' shaped ocean. It started forming around 750 million years ago. The movement of North American & South American plates westwards and of African plate - North-east ward is responsible for it.

fair Introduction

Soft



Trench = Puerto Rico Trench

Remarks

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Bottom Relief of Atlantic

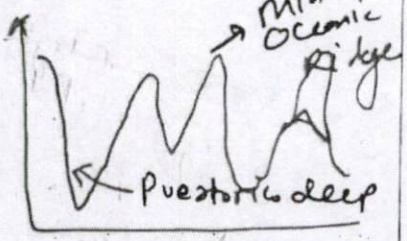
Primary Relief & Secondary Relief

a) Continental Shelf :- Wider continental shelf along Greenland., Along Brazilian coast, shelf is relatively wider.
→ Along African coast it is narrow.

→ mention various marginal seas on these continental shelf.

b): Continental Slope = Grand Canyon is present.

c): Deep Sea Plain
↳ Guyots and Seamount are found.



Cross Section profile of North Atlantic

d) Mid-oceanic Ridge
↳ divergent boundary from Greeland upto Bouvet island in South.

e) Marginal Seas = Labrador, and other water bodies

f) Trench - since divergent boundary so less, trench in Atlantic.

Remarks → mention various benefits of these deposits & landforms in brief.

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1. (c) Write a Short note on Karst landforms. (150 Words) (10)

Karst landform refers to landforms of the limestone topography. Named after karst region in yugoslavia.

their introduction:-

Karst Landforms

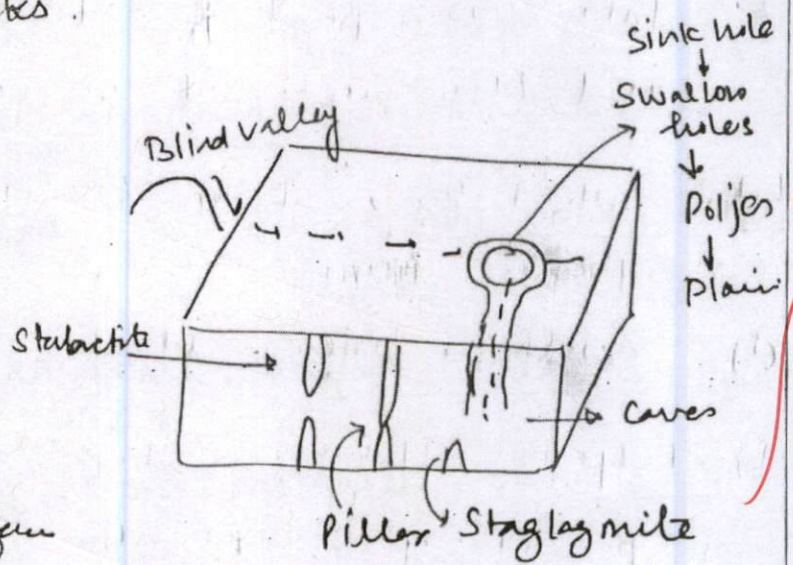
origin - Formed under certain conditions :-

a): Limestone topography

b) Subterranean streams.

c): Permeable rocks.

Landform (depositional)



their presentation given here

a): Stalagmite

They occur on the ground surface and grow upwards

b): Stalactite = They are droppings from upside

Remarks

- mention Characteristics of these landforms.

c):- Halagmite = They grow nearby the Stalagmite

d). Halactite = They grow along with stalactite

e):. pillars = Stalagmite and stalactite join to form pillar

(5)

Erosional Landform

a) Limestone Caves = They are formed through erosion eg W.M. Davis 2 cycle theory states Caves first formed in Phreatic zone and then uplifted in Vadose zone.

b):- Sink holes → through them water passes down.

c): Swallow holes - these are larger sink holes

d) Poljes = They are plain shaped feature formed by karst action of water in Karst areas.

* mention various location of karst topography regions around the world.

Remarks

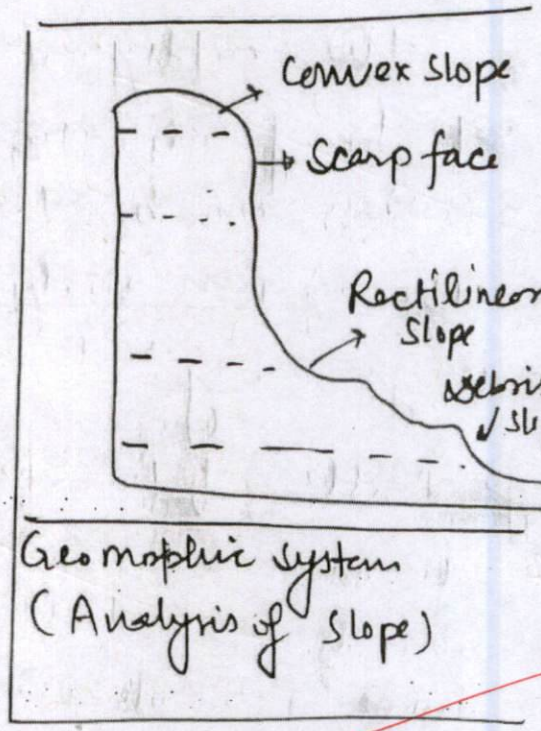
1. (d) Geomorphic System (150 Words) (10)

Geomorphic system refers to a physical system, which is connected through its environment by various links or relationships. e.g. mountain-rivers system

fair Introduction :-

5

On the slope-response system, the slope element is divided into multiple parts and then analysis of slope- and topographical aspect is done.



Geomorphic System (Analysis of Slope)

On geomorphic system various process-response system e.g. impact of climate change on glaciers can also be studied.

Remarks

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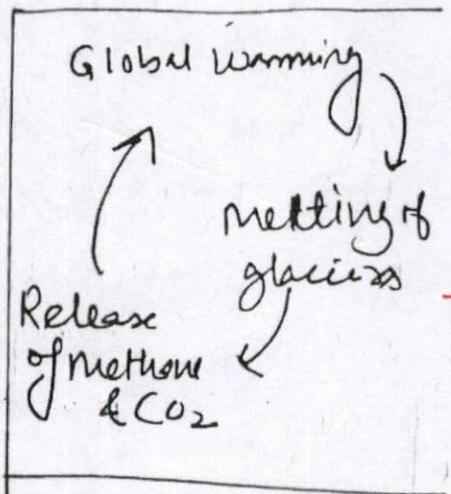
Geomorphic system aims to simplify the study of geomorphological aspect by analysing it in terms of a system, with feedback relationship (positive and negative)

The Geophysical aspects of climatic models are based on the system analysis in geography.

E.g. Melting of Permafrost, would release methane, in Arctic and this will promote further melting.

fair example.

Thus Geomorphic system helps in analysis of Geographical phenomenon.



fair example given.

fig- Cascading effect in process response system

Remarks

* mention various advantages & shortcomings of application of these system in geography.

1. (e) Write a short note on 'Peneplain' (150 Words) (10)

Peneplain is the end product of Davisian cycle. It refers to the featureless plain.

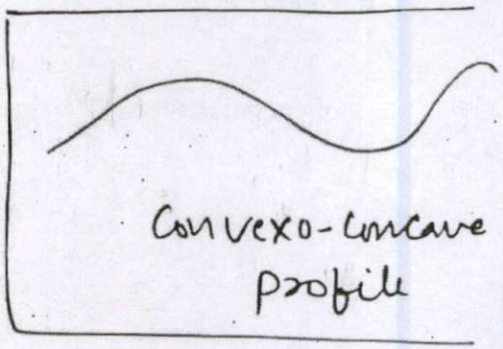
Fair Introduction given here.

Peneplain is the penultimate (final) stage. According to Normal cycle of Erosion of Davis, landform can't degrade beyond this.

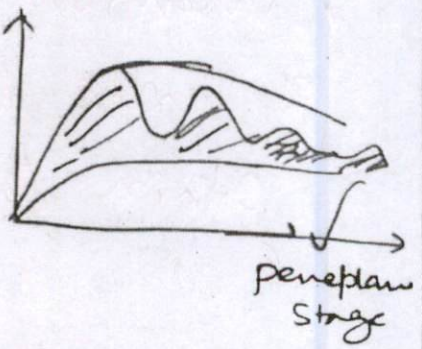
5

Features of peneplain

- They have convexo-concave profile
- formed, when energy is low and entropy is high.



- Types of peneplain



Remarks

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a): uplifted peneplane - Ranchi Plateau

b): multi-peneplane - formed by the coalescence of multiple peneplains.

The idea of peneplain was criticised by many scholars [e.g. Crickmay gave the idea of Panplain [It is a plain which may from at any stage not only the product of old stage, as peneplane given by Davis]

Similarly, Etchplain, Endzumpf, Pediplain are other erosional surfaces more or less same like Peneplain

Fair Ideas given here

* mention various advantages & shortcomings of these landforms & mention various other forms of peneplain in brief.

Remarks

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2. (a) Discuss the various theories and models on evolution of continents and oceans. (250 Words) (20)

Continents and oceans have evolved gradually after the formation of earth around 4.6 Billion years ago.

fair Introduction given :-

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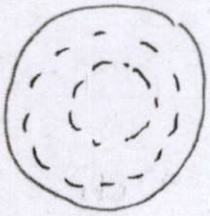
Models

a) Succomposition model → Homogeneous Accretion model → they exhibit that earth's crust and continent has evolved through the accretion of material



b): Catastrophic model

- Big Bang Theory ⇒ Earth formed due to collision and gradually continents and ocean formed.

Theories

a):- Continental Drift Theory of Wegener ⇒ It provides the hypothesis that

- mention various evidences given by Wegner.

Remarks

* Add views of Kobers geosynclinal views on formation of continents & Oceans.

due to dynamic shifting of continent, the present day topography has developed

e.g. Phase 1:- Carboniferous phase = All Continent where at present day Durban [Pangea]

Phase 2 → Pangea moved towards north due to poleward forces and westward forces

Phase 3 = Breaking down into Angaraland & Gondwanaland.

(b) Sea floor spreading

by H. Hess ⇒

Formation of oceanic crust.

↳ Along Trenches, crust is consumed, along ridges new crust is formed

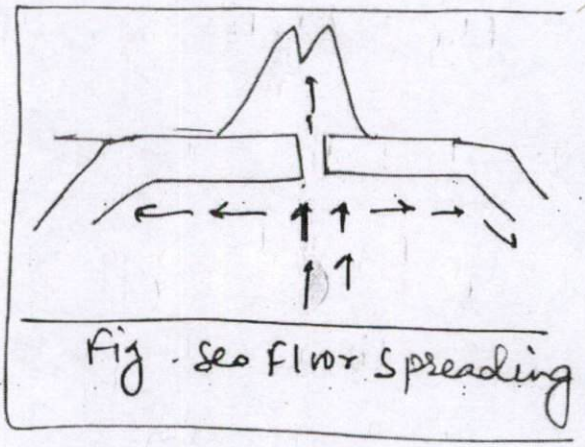


Fig. Sea Floor Spreading

(c) Plate Tectonics

a):- Micro-plate Tectonics :- Micro plates

Remarks After continental drift theory try to bring in a passing refrence of views of Arthur holmes convectional current theory etc..

were formed due to upheaval of granitic magma. Granitic nuclei formation occured.

(2): Surge-plate Tectonics (b/w 200 million years to 50 million years) = Micro-continents collided with each other and formed surge plates.

(3) Modern Tectonics (After 200 million years ago)

↳ 7 major plates and other minor Plates

↳ As plates collided, formation of Continent and ocean took place

↳ Types of Boundaries ⇒ Convergent, divergent and Transform

Mountains are formed through various interactions among plates

e.g. Continent-Continent collision, Continent-ocean collision etc

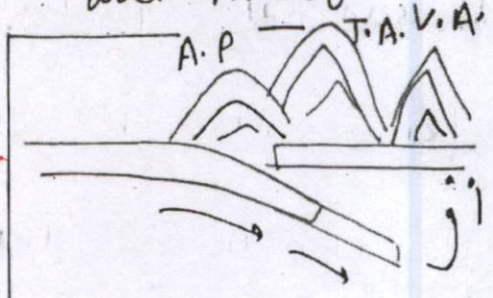


Fig - Subduction

AP = Accretionary prism

TA = Tectonic Arc

VA = Volcanic Arc

mention different types of plate & different plate collision & use diagram here.

Remarks

However, there have been other major theories too ⇒

a): Tidal Hypothesis of Jean & Jeffry

b): Geosynclinal theory by Kober = which highlights the evolution of continental mass in various stages.

Thus, various theories & models have tried to explain formation of continents & oceans. Most satisfactory among them is Plate Tectonics.

could have written about this in brief at the starting only

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2. (b) Geomorphological technologies have increasingly influenced economic aspirations of Nations. Elaborate with suitable examples. (200 Words) (15)

Geomorphological technologies play an important role in growth and development of Nation. As suggested by Ackerman, technology is an important compment of attaining growth.

similarly Rostov model of Economic transition also mentions the role played by technology, which mentions development of technology is necessary ~~is the~~ condition for economic transition. However, in current times most of the countries rely on imported technology (e.g India's reliance on GPS of USA earlier (before IRNSS).

good Inter connection of Ideas

fair Inter connection of Ideas mentioned here.

good examples given here.

Geomorphological technologies

a):- Disaster Resilient Architecture ⇒ National Building code, 2005 of India highlights

* mention how geomorphological technologies have helped disaster management of various prone areas ie (in) coast topography, hilly regions

Remarks

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the need for installing disaster resilient infrastructure and the buildings should be in consistent with local topography.

b): Slope management ⇒ During road construction in hilly areas, slopes should not be cut at 90° angle

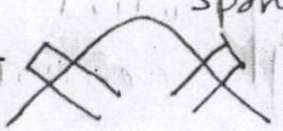
e.g. use of technology like retainers, and suitable material for road construction like cold mix technology will help.

fair example given

c): Aquifer management (Groundwater) = Through Aquifer mapping, the ground water resources can be identified for suitable economic development.

good example given here

e.g. Sikkim's Dhara-Vikas project to revive springs



(d). Use of Geographical information system

e.g. In soil mapping. [Soil health card], and management of soil fertility.

Remarks

(e) Surveillance by drones of any geomorphic hazard.

D.K.C. Jones have also suggested that technology will play an important role in geomorphic considerations.

8

Further, in applied geomorphology in exploring minerals, the use of advanced technology is of great importance

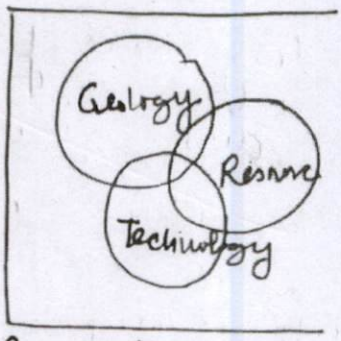


Fig:- optimum resource exploration

good examples given in your answer

e.g. Shale gas technology.

e.g. India lack the Technology for Rare Earth mineral extraction.

Case study } India has got license for exploration in Central Indian ocean, but due to limited technology, we have not yet started this efficiently.

good case study given here

Technology will help in equitable growth and development. It is technology with make resources.

fair conclusion give here.

Remarks ↗ You have written a well structured answer with good examples in your answers keep it up.

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2. (c) Critically examine the coral reef formation theory as proposed by Darwin. (200 Words) (15)

fair introduction given here

Coral Reefs are the symbiotic relationship of Sea Anemone (Coral polyp) with Algae, where polyp provides shelter and algae makes food.

Due to their high productivity they are termed as "Rainforest of the Ocean".

Coral Reef formation Theory of Darwin

- Darwin in 1842, gave his subsidence theory for evolution of corals.
- According to this theory corals evolved in gradual stages and the three type of corals (e.g. Fringing reef, Barrier reef and Atoll evolved in a sequence.

Theory

Phase A = In this stage fringing reef is formed

- They are formed due to

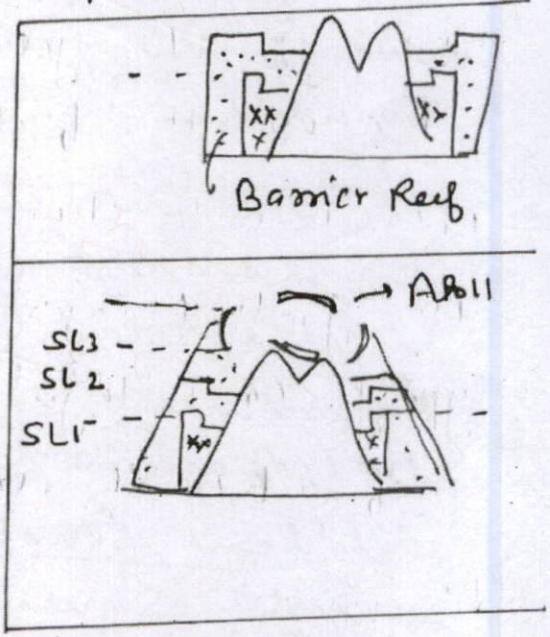
Remarks

→ mention various assumptions made in the theory of Darwin in formation of coal reef.

interactive relationship b/w Coral polyp and algae and the need for nutrient and sunlight is the reason for their growth.

Phase 2 = In this phase Island further subsides and Coral further grow upwards.
• In this stage Barrier Reef is developed.

Phase 3 = Atolls are developed, which are ring like formation and island completely subsides.



Critical evolution

a):- Murray rejected the subsidence theory and gave his model and mentioned Corals originated in submarine craters.

b):- Pleistocene Theory ⇒ Sea level during

Remarks

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pleistocene Sea level dropped and continental shelves were exposed

e.g. Hard rock = Fringing Reef
Soft Rock = Barrier Reef.

(c):. Pacific has thousands of coral reefs, but subsidence of these many islands is illogical.

(d). Further, Pacific is stubbier plate, any activity happens at plate boundaries, while middle of plate undergoing any subsidence is not logical.

(e) physiographic Theory of Davis, through his experiments found that not all coral reefs can be explained through subsidence.

(f). In many coasts fringing and Barrier reefs are found simultaneously., while Darwin suggested Sequential development

Thus, though Darwin's ideas were revolutionary but it sought many modifications.

Remarks

* mention how Daly & Dana's theory overcame the problems in the theories by Darwin's Ideas.

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4. (a) What is Isostasy? Discuss the views of Airy and Pratt on Isostasy. (250 Words) (20)

Isostasy concept was given by "Dutton". Later "Bouger" studied isostasy in detail.. Isostasy refers to mechanical equilibisium between various reliefs, as they exist over the earth crust.

their introduction given here.

Views of Airy

Basic Postulates

a): The SIALIC layer floats over the Sinatic layer

b): Law of floatim ⇒ He suggested that Himalayas are floating over the mantle substratum (lava).

c): Root formatim ⇒ all mountains and plains have roots.

d) Force of Buoyancy occurs in the mountain, plains etc.

Remarks * mention briefly on Idea of gravitation al-anamolies, which paved the way for Isostasy theory.

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Main concept

- Density of various columns remains same while the depth varies.
- Greater the column, greater the depth occupied.

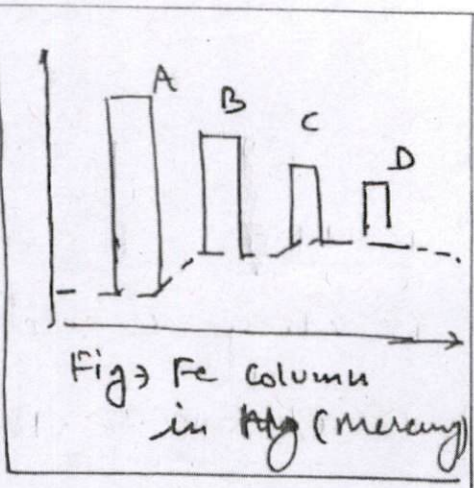


Fig → Fe column in Hg (mercury)

Views of Pratt

It is claimed that Pratt's model was independant but it aimed to refute the basic postulates of Airy.

Theory ⇒ a) He rejected law of floatin.

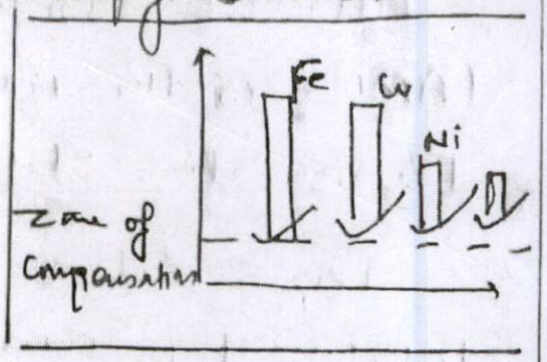
b):- He gave the idea of zone of compensation - along which the density of all columns is equal.

c): He rejected root formation theory.

d):- His main idea was → density varies

Remarks

With the height of column and all mountain column occupy similar depth.



Later isostasy was evolved and many scholars like Heiskanen has modified the concept. He combined the concept of Airy and Pratt and postulated with depth density varies and all columns occupy different height.

Fair Inter connection of Ideas.

(10m)

Current Application ⇒ Himalayas are gaining height, this can be explained with the help of isostatic adjustment.

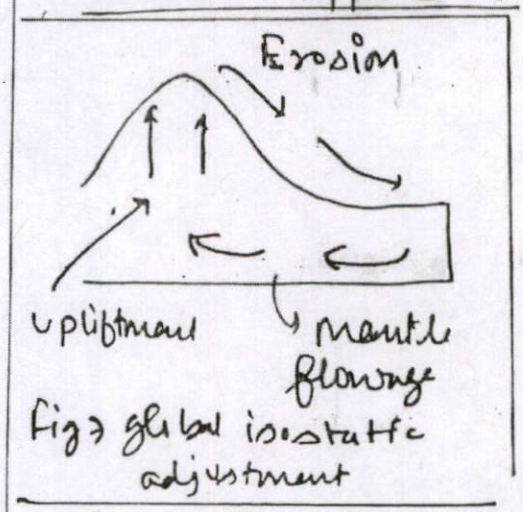


Fig: global isostatic adjustment

⇒ Plate Tectonics also supports this, isostasy may work along the plate boundaries.

→ mention loopholes in both of these views & write the criticism of these views.

Remarks

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4. (b) The decline of the Atlantic Meridional Overturning Circulation (AMOC) might cause global existential threats to humanity in myriad ways. Analyze. (200 Words) (15)

Atlantic Meridional overturning circulation (AMOC) is the Atlantic part of Thermohaline Circulation.

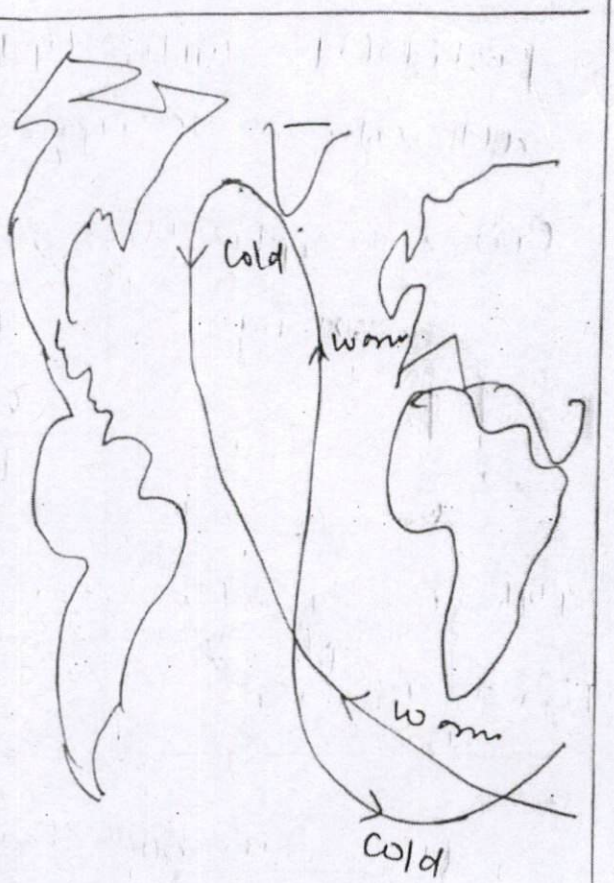
Thermohaline circulation refers to movement of water due to change in density and salinity, along with temperature change.

fair definition given here :-

AMOC

origin → It originate near Norweigen coast due to sinking of denser water, and flows in conveyor belt fashion.

Recent changes ⇒ due to global warming.



Remarks

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it has been found that AMOC has slowed down.

Impact of slowing down of AMOC

a):- Oceanic current - It will also cause slowing of oceanic currents and thus nutrient availability to various water would be restricted

e.g. Fishing at Labrador coast, Dogger Bank, British Isles may severely get affected.

b). Marine heat Budget will be disturbed. It will disturb various bio-geochemical cycles.

c). More frequency of adverse weather phenomenon like hurricanes in Atlantic in recent years due to warming (caused by stagnation of water)

(8)

Remarks

* mention more of its consequences of monsoon, forest fires in the region of California & western europe region.

(d). Marine heat waves are the recent phenomenon

Case study ⇒ Florida saw the worst marine heat wave and resultant terrestrial heat waves of last 1200 years in past year.

good case study written.

(e) Permafrost and Arctic melting ⇒ This unequal distribution of heat will cause melting of Arctic by 2100 as suggested by IPCC.

(f). Cascading effect ⇒ due to ice melting the salinity in polar areas will be reduced, thus lesser sinking of water and slowing down of AMOC further, which will affect the global climates.

melting of ice ↑ → Release of CO_2 → Global warming → melting of ice

good presentation of Idea here.

Thus any change in AMOC will affect humanity in myriad ways, (hypoxic zone, loss of Biodiversity and many more)

fair conclusion written here.

Remarks

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4. (c) The successful implementation of the Sendai framework for disaster risk reduction for Urban areas lies on accurate collection of geomorphological information. Elucidate. (200 Words) (15)

Sendai Framework for disaster risk reduction [2015-30] aims at reducing the risk of disaster and mitigating the serious impacts. (8)

Targets under SENDAI

a):- Reducing the loss of lives and livelihoods

b) Minimising the economic losses

c):- Creating more disaster resilient infrastructure

d) Bringing community support

good mentioning of various components.

Geomorphic information

a):- Morphological considerations

→ Arrangement of houses, lanes and their relationship.

→ Level of growth ~~(e.g.)~~ Horizontal / Vertical Sprawl.

Remarks → Use diagram to show various regional trends in various urban areas impacted by various geomorphological activities.

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b) ↳ kinds of underlying terrain for making it earthquake resistant

↳ Consideration of river channel morphology (e.g. Patna., Chennai

↳ population occupancy analysis (Adyar river)

fair usage of various ideas of geomorphology

b):- Geomorphological information collection based on technology will help in sound regional planning.

e.g. Thenmala in Kerala has been developed as eco-tourism hub of Kerala [First in India]. This has been done considering unique topography and related geomorphic information, considering carrying capacity of land and responsible tourism is being promoted.

good examples given

c): In Chennai the Urban Flood occured due to lack of planning and research

Remarks

Geomorphological information is important for disaster resilient planning.

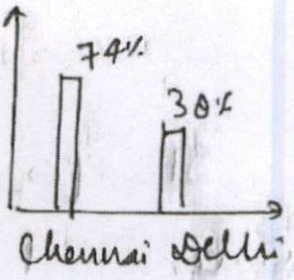

Fig → Urban wetland lost since 1960s

→ give examples of various regions across the world as well.

- In Gujarat, the major part is under severe or very Severe earthquake area (Bhuj Earthquake). Sound planning has helped in developing the epicentre of Bhuj earthquake.

Way Forward

Approach for disaster Management

Structural	Non-Structural measures
→ Construction of disaster resilient infrastructure	→ Sound planning
→ promotion of climatically Suitable technology	→ deployment of GPS, GIS, Remote Sensing

Remarks

→ try to bring in more content on the disaster Impacted regions across the world

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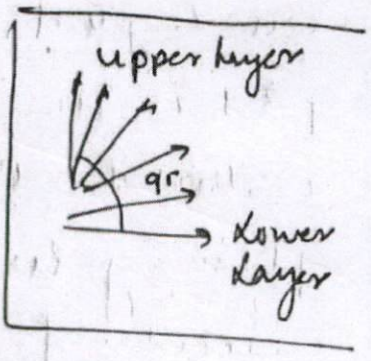
Section - B

5. (a) Ekman Transport (150 Words) (10)

5

It refers to the piling of the water and resultant movement of oceanic current.



Various mechanisms or forces addressed

Due to friction between the different layers the speed and direction of waves vary in different layers.

If upper layer is having a certain direction, the lower layer due to laminar flow, may ~~xxx~~ not be able to accompany the above layer and may get slowed down and left behind in direction.

Similarly this increases as we move

Remarks

downwards, and this leads to Ekman pumping, especially visible near Equator i.e. North Atlantic Equatorial current and its offshoots.

It plays an important role in oceanic transport by dynamically moving the water and also maintains the nutrient availability, prevents the formation of hypoxic zone (low oxygen zone)

fair conclusion written here

* mention various benefits of these ekman transport or spiralling winds in upwelling.

Remarks

GS SCORE

5. (b) Write a short note on 'Development of Palimpsest Landscapes'. (150 Words) (10)

Palimpsest Topography refers to the earliest topography on, which development has occured

Characteristics of Palimpsest

a) Pre-Cambrian in nature

b) multiple cycle of evolution

c) Polygenetic

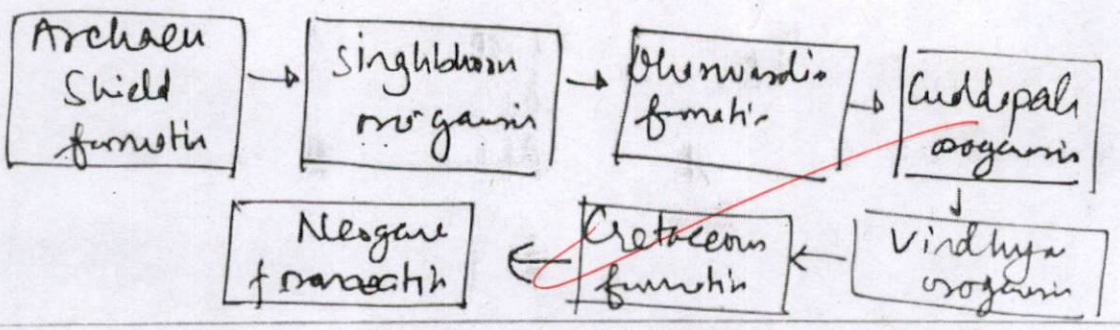
d) polyclimatic

e) Convexo-concave in profile.

Development

It passes through various stages

Case study :- Ranchi Plateau (Jharkhand)



Remarks

* mention the causes for these palimpsest landforms & mention their characteristics.

GS SCORE

Ranchi Batholith developed in Pre-Cambrian period. Later it passed through several phases of Singhbhoom orogeny and Dharwadian and latest one being the neogene formation.

The study of Polimpsest helps in denudation chronology and reaching the ancient level of landform with relative and absolute dating techniques.

fair mentioning of benefits & way ahead of these landforms.

Remarks

5. (c) Write a short note on different relief features on the earth's surface with suitable examples. (150 Words) (10)

Relief refers to various heights and depth on earth surface.

Relief Features

a) Primary Relief → continent and ocean

b) Secondary Relief = mountain, plains

↳ mountains → Fold mountain
→ Fault mountain
→ Volcanic mountain (Mt. Hawaii)

↳ Plains → Alluvial plains (Ganga)
→ Lava plains

↳ Plateaus → Lava plateau (Deccan)
→ Karst plateau
→ Piedmont

4.5

Remarks

GS SCORE

(c). Tertiary Relief.

Refers to various valleys and minor topographies developed on primary and secondary relief features.

Eg → Grand Canyon of USA

→ Rift valley of Narmada, Tapi, Damodar etc

Relief feature developed through various exogenetic and endogenetic processes.

*use diagram to show various of these landforms & mention the causes/force behind these landforms.

Remarks

GS SCORE

5. (d) Elastic Rebound Theory of earthquake. (150 Words) (10)

Fair Introduction given

Earthquake occurs through elastic rebound (release of pressure) from earth crust, or when the elastic limit of the rocks is breached it causes elastic rebound and earthquakes occur

Elastic rebound theory acts across different plate margins and it forms a plausible mechanism for earthquake along with other factors like :-

→ Radioactivity

→ Collision of inner material causing convection current

Rocks are considered Brittle in nature as they break they tend to ~~repb~~ readjust themselves this is the

Remarks

GS SCORE

basic hypothesis behind Elastic rebound theory.

3.5

Remarks

5. (e) Write a short note on 'Ocean deposits'. (150 Words) (10)

* fair introduction given here.

As per Murray the oceanic deposits can be divided into Terrigenous and pelagic deposits. Further Jenkins has categorised them into shallow, deep sea and littoral deposits.

3.5

Oceanic deposits

- Terrigenous
  - Sand
  - Gravel
  - Silt
  - clay
  - mud
- Pelagic
  - Ooze
    - Calcerous ooze
      - Pteropod
      - Globigerina
    - Siliceous ooze
      - Radiolaria
      - Diatom
  - mud
    - Blue
    - Green
    - Red
  - Red clay

Sand, Silt, clay, Gravel are found along the

Remarks

* use diagrams to show various of these depositions.

continental shelf area.

Ooze are the organic deposits found along deep Sea plains

Red Clay → 27% of total oceanic deposits.

Further Polymetallic Nodules, Gas hydrates are the other oceanic deposits., they complement the land resources.

* mention various projects launched across the world to harness these deposits.

Remarks

GS SCORE

7. (a) Any disruption to the abyssal ecosystem of the ocean significantly impacts pelagic and mesopelagic ecosystems. Discuss with respect to deep sea mining. (250 Words) (20)

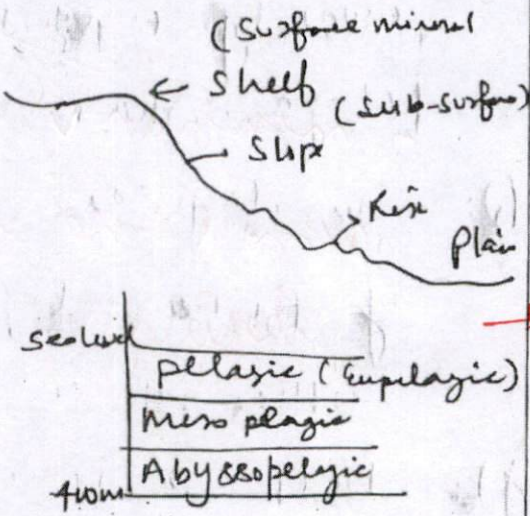
Intro- given here.

Currently many countries including India are undergoing deep sea projects. Any change in sea bed topography (Abyssal ecosystem) will have consequences for pelagic and mesopelagic system

Impact of deep sea mining

a):- Marine pollution

↳ Drilling causes severe turbidities and sedimentation



good presentation done here.

b): It will also cause loss of Biodiversity

↳ many pelagic animals / fishes are dependent on bottom living plants / phyt zooplanktons etc.

Remarks

GS SCORE

c) Deep sea mining will affect coral reefs

d):- In Pacific ocean it was found that drilling (experimental) causes severe pollution in several sq. km range & thus it has multiplier effect.

e):- Chinese construction of Artificial island in South china sea is severely impacting the topography and pelagic system.

f):- In deep sea mining areas, the migration of fishes (pelagic) may occur to other places.

g):- Deep sea mining may disturb global oceanic circulation due to release of methane hydrates [e.g.] methane gas may release into atmosphere. It will affect all zones of ocean.

Remarks

(h). Release of CO_2 due to deep sea mining will cause oceanic acidification

11

There is need to promote Sustainable mining and check pollution. International sea bed authority should act responsibly and global alliances like Blue Nature alliance should cooperate for minimising pollution

UNCLOS under its charter has mandate to regulate oceanic pollution. this should be effectively used. Initiative like Clo Litter project along with sustainable mining technology development should be promoted.

Fair conclusion written here

* mention how Illegal unregulated unsustainable fishing is also causing threat to the fragile abyssal ecosystem, mention how deep trawler usage is causing threat to these ecosystem.

Remarks

GS SCORE

7. (b) Compare the views of W.M. Davis and Penck on the cycle of erosion. (200 Words) (15)

W. M. Davis gave the cyclic evolution of Landforms model, while Penck gave Geomorphic cycle of evolution

Fair Introduction given.

W. M. Davis	Penck
• It is based on Trio of Davis → Structure, process and time	• Based on phase ↳ It is time independent model based on processes.
• Time dependent	
• Upliftment is rapid and episodic	• Upliftment is slow.
• Focussed mainly on Exogenetic forces during later stages	• Gave enough importance to both endogenetic and exogenetic processes.

8

Remarks

GS SCORE

• Davisian cycle originates (Starts) once upliftment stops.	• Penck's model starts from fastenbene, which is also termed as primarumpf stage (Primary roof)
• Slope change Mechanism → Slope Decline	• Slope change mechanism → Slope Replacement (parallel retreat)
• Movement of geomaterial through downwasting	• Backwasting
• End product is peneplain	• End product is Endrumpf.
• Model starts in wet climate & ends in wet climate	• Starts in wet climate but ends in arid/semi-arid condition

Remarks *use diagrams in this answer to show various stages.

• Ultimate maximum relief is attained at the end of youthful stage.	• UML is attained during waxing phase (Sub-phase A)
• It has divided mature stage into early maturity and late maturity.	• Waxing phase has triple division - Sub-phase A, B, C

Both Davis and Penck contributed to slope analysis and analysis of landforms through their unique methodologies (e.g. Penck - geological point of view).

mention how the shortcomings in this was over come by J.T. hacks non-cyclical theory.

Remarks

GS SCORE

7. (c) 'Channel Types are mainly determined by lithological characteristics of region'. Comment. (200 Words) (15)

Channel refers to cavity between two valley sides, through which water flows.

Channel types

a):- Bedrock Channel

(b). Alluvial Channel

Bedrock channel → Found over hard rocks

e.g. Limpopop in its main course and Congo have this type of channel

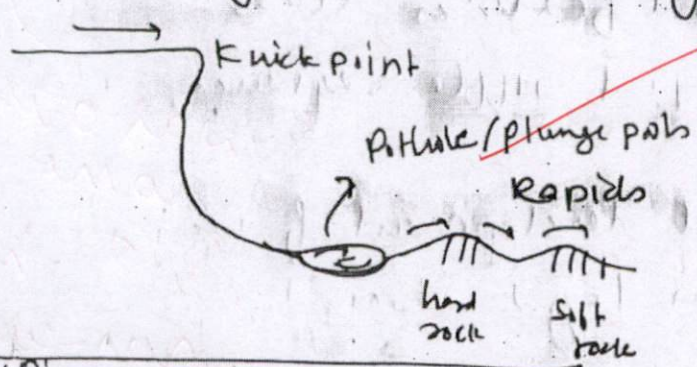


Fig - Bedrock topography

- Landforms are mostly erosional in nature.

Remarks

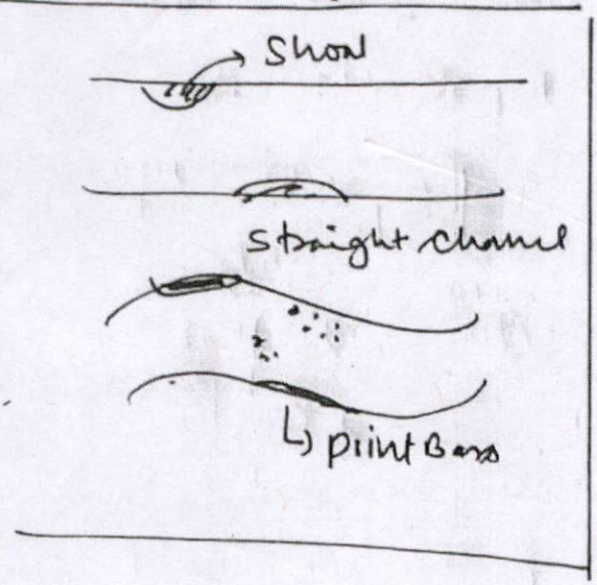
- The Cataracts and waterfall are formed over hard rocks which causes the water to flow from a steep area.
- Similarly, the regular arrangement of hard & soft rocks give rise to Rapids.

Alluvial Channel

- Generally in this the bed rock is not exposed.
- The underlying bed rock give way to many structural features like development of pool-riffle sequence.
- The sequential development of various channel types (eg Straight, meandering, Braided, Anastomosing, Anabranching (Mississippi) is the characteristic of bed rock channel.

Remarks

e.g. Found in majority of the course of river Ganga



Thus, Channel bed topography is mainly decided by the underlying surface

The sediment load, Channel, width, and many other factors are the product of this.