

142

GEOGRAPHY

Time Allowed: 3 hrs.

Max. Marks: 250

Instructions to Candidate

- There are Eight questions divided in two Sections.
- 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 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 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 chronological order. Unless struck off, attempt of a question shall be counted even if attempted partly. Any page or portion of the page left blank in the answer book must be clearly struck off.

- Good attempt
 - Good grasp on geomorphology
 - Some concepts related to environmental geography & climate change need to be clarified.
 - Keep it up. You are on the road to 300+
 [Signature]

Name YASHARTH SHEKHAR

Mobile No. _____

Date _____

Signature _____

1. Invigilator's Signature _____

2. Invigilator's Signature _____

REMARKS

Evolve IAS
Actualize your potential

SECTION-A

Attempt all questions:

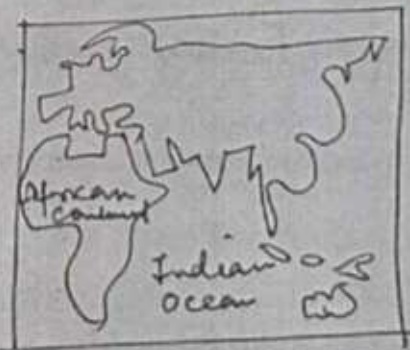
1. Write short note on following in not more than 150 words:

(10 × 5 = 50)

- Write a short note on different relief features on the earth's surface with suitable examples.
- Ocean bottom relief of Atlantic Ocean
- Write a Short note on Karst landforms.
- Geomorphic System
- Write a short note on 'Peneplain'

(a) As Gilbert argued earth is in dynamic equilibrium between tendencies to create vulnerability and tendencies to create uniformity and formation of many relief features: *good intro*

I: 1st order relief feature — These includes continents and oceans eg African continent, and Indian ocean

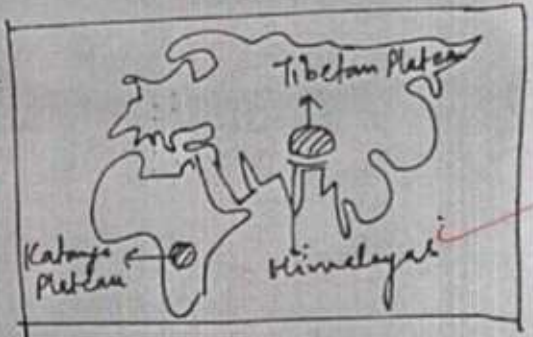


formed due to cooling and consolidation and plate tectonic movement. *good answer*

Remarks

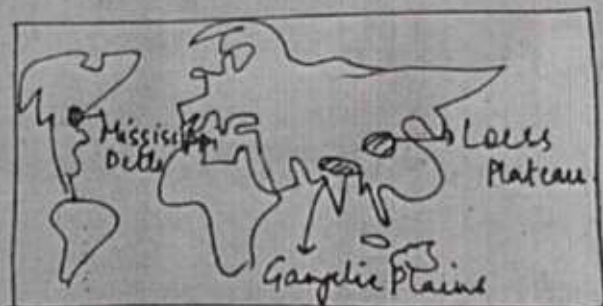
II 2nd order relief features like mountains, plateau, plains except depositional plains.
eg Tibetan Plateau in Asia, and Katanga Plateau of Africa; Himalaya Mountains, and Andes of South America

- formed due to orogenic and epeirogenic forces *good*



III 3rd order relief features - include those formed by agents of erosion eg. *deposition, residual, minor factors*
Gangetic Plains, Mississippi Delta, Loess Plateau.

formed by 2nd order features



All these features induce variability on earth's crust.

b) Atlantic Ocean is the 2nd largest ocean with ~~star~~ surrounded by Africa and Europe on the east and Americas on the west.

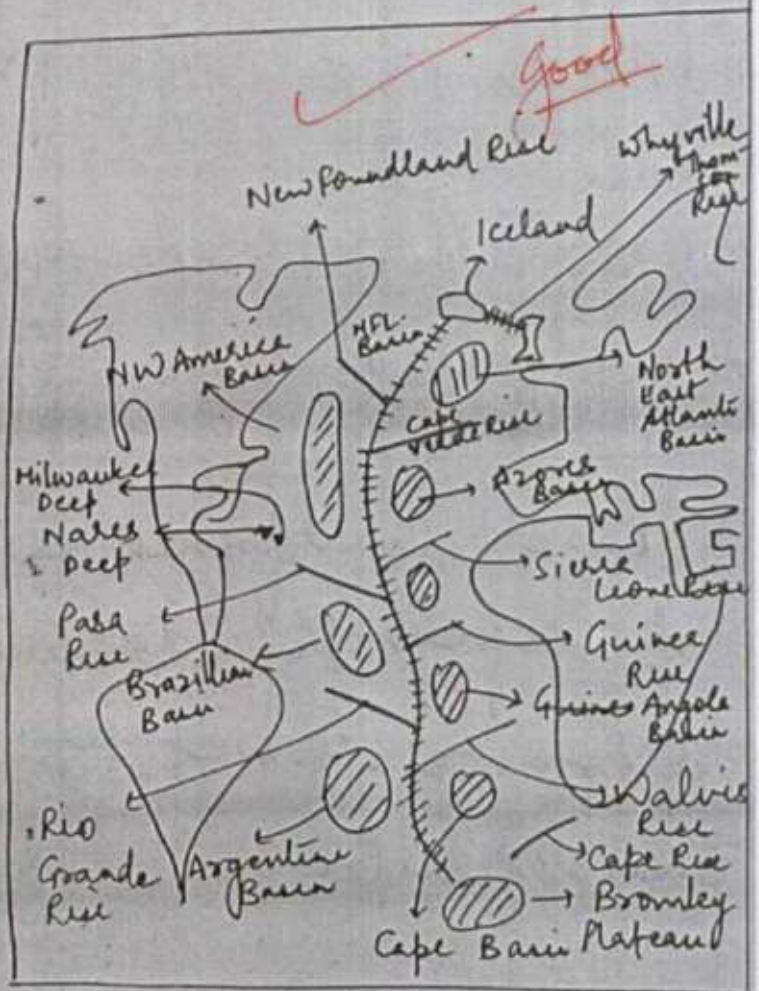
7 on the west.
v. good

(i) Continental shelves:

Broad near Northern Europe include Dogger Bank

Broad near North East USA → New Foundland (NFL) area around Plateau Estuary in South America

NARROW near Western coast of Africa



Marginal Seas

(2) Ridge (i) Mid-Atlantic Ridge between Iceland and Bromley Plateau
(ii) Whyville Thomson Ridge

- (3) (iii) Reykanees Rise
 (iv) Pala Rise
 (v) Walvis Rise
 (vi) Cape Rise
 etc

- (3) (iii) Basin (i) Brazilian Basin
 (ii) Argentine Basin
 (iii) Angole Basin

(IV) North West American Basin

- (4) (iv) Deep → deeps are found
 (i) Nales deep &
Milwaukee deeps



(i) Karst landforms are found in area of topography dominated by limestone or dolomite. eg. Karst region of Yugoslavia.

- Characteristic : good
- ① Thinly bedded and jointed plains
 - ② Area of moisture and water
 - ③ Less vegetation
 - ④ Not excessively low or high rainfall

Landforms of Erosion include
 (i) Sinkholes - where stream disappears
 eg. Gaping Ghyll of Yorkshire

(ii) Polje → eg. in Yugoslavia → large depression

(iii) limestone cliff eg. Cheddar cliffs of England.

Other include Uvalas, Dry valleys, Swallow Hole etc

Depositional landforms:

(i) Dripstones like Stalagmite and Stalactite of Onangada cave of Missouri or Siju Cave of Meghalaya

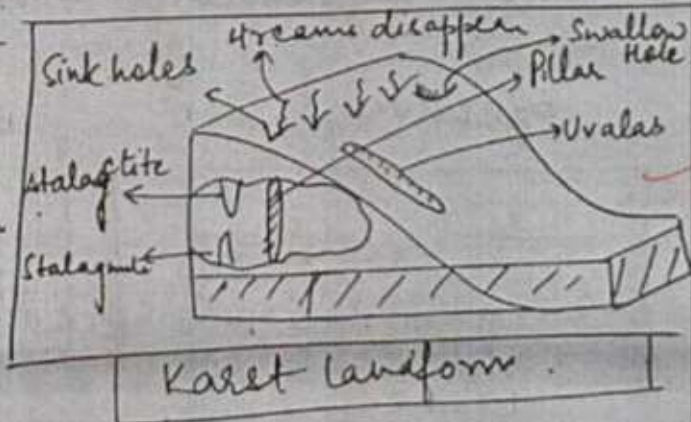
(ii) Curtain like feature formed from dripping $CaCO_3$ solution

(iii) limestone caves → eg Siju Caves of Meghalaya

Main Process active.

(i) Solution of limestone into carbonic acid

(ii) Hydraulic action of falling raindrops forming cliffs and other holes.



(d) Geomorphic system may be a closed or open system that works to maintain internal consistency.

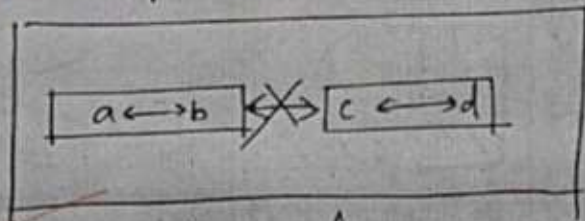
It was described as a closed system *no input of energy & matter*

by geographers like W.M. Davis who thought that the system will undergo progressive and sequential change in form with no outside interaction.

Geographers like J.T. Hack, AN Strahler or M. Morisawa described it as an open system with elements of the system interacting with outside world.

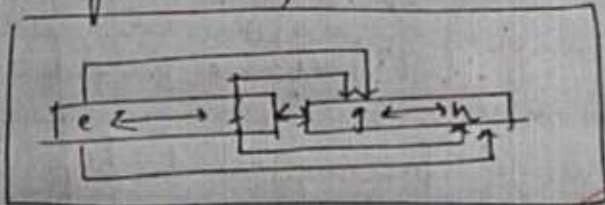
both energy & matter enter & leave the system

By Davis



closed system

By Gilbert, Hack, Strahler.



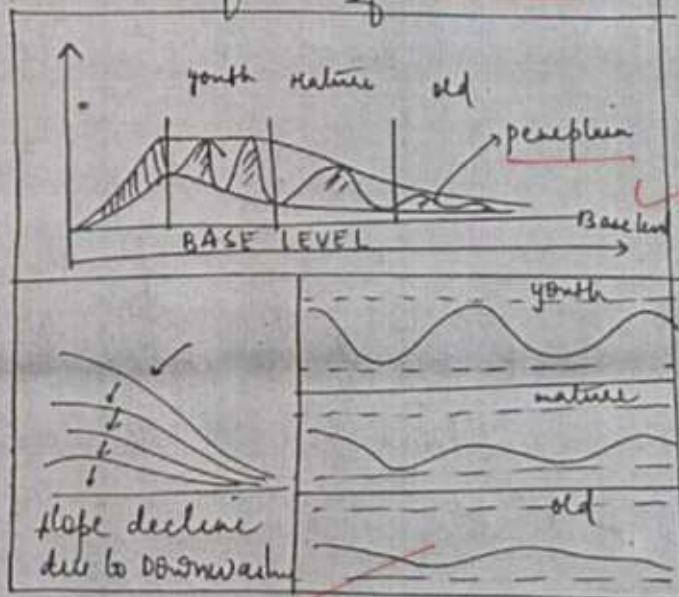
Open system

Geomorphic system types

Any change may be induced in system but a geomorphic system has a tendency towards equilibrium and thus in the final form the sum of force/energy acting on any system is 0.
[Gilbert] eg. a graded river is a geomorphic system. But if due to rejuvenation it is activated, it will work to restore the new graded profile.

Feedback
+ve
-ve

(e) Peneplain is the plain surface of maximum entropy found at the end stage of cycle of erosion by Davis.



Characteristics

(i) convexo-concave in nature

(ii) concave feature expand so the radius

Remarks

7

of curvature increase as time progresses

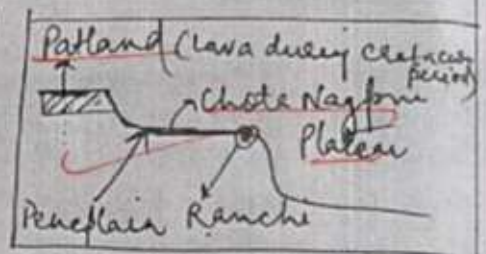
(iii) steep decline mechanism of formation
is may be interrupted by resistant hillocks
like Monadnock

(iv) featureless plane with no process acting on it

eg. South East of Orals

(2) Chota Nagpur Plateau is an
uplifted Peneplain

To study this peneplain,
we use techniques like
Dendudational chronology



However there are many difficulties
in the study of Peneplain

(i) Not present everywhere

(ii) technique of Dendudation chronology not
suitable everywhere

Nevertheless, peneplain is a
useful concept in the cyclic theory of
landform development.

Remarks

Answer the following questions:

- (a) Discuss the various theories and models on evolution of continents and oceans. (250 Words) (20)
- (b) Geomorphological technologies have increasingly influenced economic aspirations of Nations. Elaborate with suitable examples. (200 Words) (15)
- (c) Critically examine the coral reef formation theory as proposed by Darwin. (200 Words) (15)

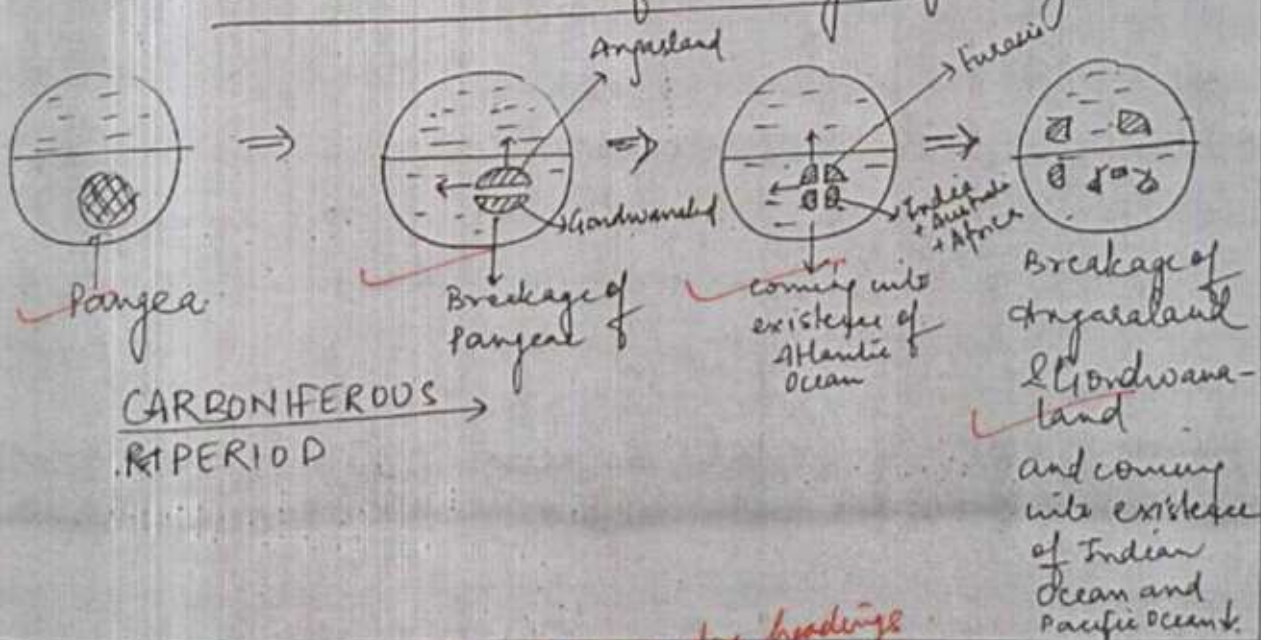
(a) Many theories and models have been given to explain the origin and evolution of continents and ocean. But most important are:

- ① Continental drift by Alfred Wegener (1912)
- ② Sea floor spreading - *Hux*
- ③ Convectional current theory of Holmes
- ④ Plate tectonic theory - *Wilson*

13

Continental Drift Theory by Wegener

very good



Remarks

Divide your answer under headings

The theory went on to explain the present geographical existence of continental and gave evidences of geological similarity (rock of same age across continents), geographical similarity (SA), presence of tillite on South Africa, India and Australia, ~~Wegener's~~ [Paleo-Paleo climatic evidence) along with presence of fossils of similar flora and fauna across continents e.g. glossopteris flora.

gig same fit

However, it was rejected because of many reasons like

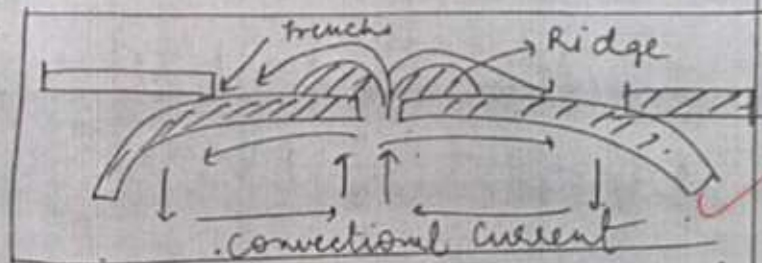
- ① No true ~~glo~~ geographical similarity as proposed by Bullard
- ② Contradiction: At one point Wegener says Sialic Masses drift over time, at other point he says, they have friction and cause mountain formation
- ③ Force — whether tidal or differential gravitational force not sufficient to cause drift.

substantiated

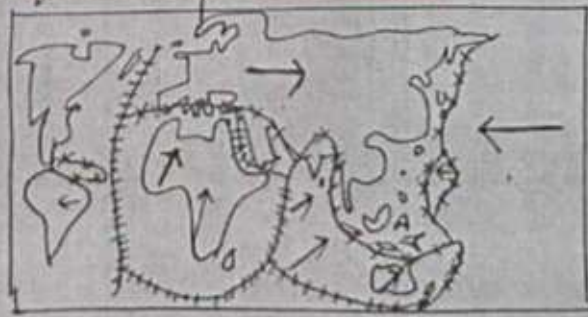
However, J.A. Steers believes the great idea of Wegener idea was acceptance of horizontal movement

Remarks

Wegener theory assumed ocean floors to be passive. However, H. H. Hertz and Harry Hess put forward the theory of sea floor spreading to explain the role of ridges and trenches and incorporate that the force of convectional current is responsible for plate movement [Arthur Holmes]



Then came the plate tectonic theory which combined the role of continents (of Wegener) and ocean floor of Hess and force responsible of Holmes to argue that lithosphere is divided into slabs called plates and they are floating over semi molten asthenosphere and it is the interaction of these plate that lead to



formation of relief features like
 mountain of Himalayas (Convergent Plate)
 Ridges of Calberg (Divergent Plate) and
 Transform Plate of San Andreas Fault

(b) Resource is a function of
technology (Zimmerman) so if we
 develop good tech then we can make
~~resource~~ which were not exploitable,
exploitable.

7 eg. the recent development of
 technology to exploit shale oil and gas
 led to revolution in oil market which
 not only crashed prices of petroleum but
 also increased production of oil and
 reduced dependence.

Similarly, the tech development of extremely powerful submersible vehicle have led to the race for exploitation of polymetallic nodules in the EEZ of nations.

Link of geo-
logical technology
& economy

The reason for all this are:

→ Mineral exploration & recovery.

① Increase spending on R&D

→ Regional planning & development.

② Evolution of Industrial Revolution 4.0 and increasing reliance of next gen tech.

→ Engineering + construction need to be addressed.

③ Shortage of many rare earth minerals like Lithium for battery ⇒ increased creation of new exploitative tech.

④ Competition between powers like Turkey and Greece over exploitation of recently found natural gas in Eastern Mediterranean Sea.

⑤ Declining levels of Petrol and coal and need to find new resource in time of climate change.

Implication

+ve

- ① help us restor climate change
- ② spillover effect of tech into different sector
- ③ Economic growth & dev.

-ve

- ① conflict eg. Turkey and Greece over oil/gas
- ② Exploitation at unsustainable pace of limited resource
- ③ hurt marine ecological system with exploitation of PMN.

The resource utilisation has to be on sustainable level and must not lead to geological / geosecurity threats

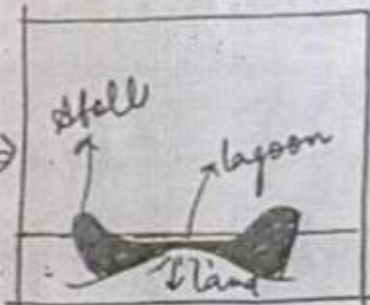
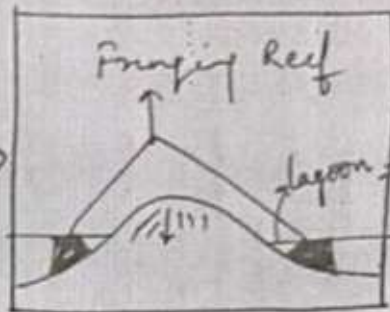
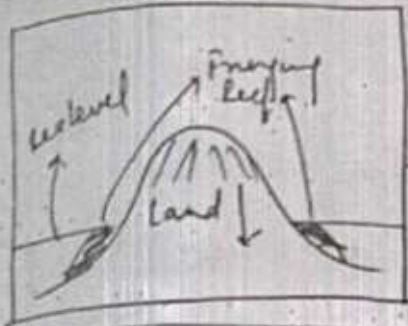
⑧

good

As per Darwin, the three type of reef i.e. Fringing Reef, Barrier Reef and Atoll are not separate element rather they are all part of an evolutionary cycle of Coral Reef i.e. stage in the formation of Atolls.

Remarks

→ 'Subsidence Theory'



Coral grows towards light

1st stage - Fringing Reef - formed on a stable land so they grow on seaward side as food is brought by ocean current now land starts subsiding ⇒

2nd stage - Barrier Reef Now increased upward on part of coral to grow upward and outside. While on landward, erosion and weathering expand boat channel into a lagoon.

3rd stage - Atoll land goes completely under water and stalls are formed with a shallow lagoon in the middle.

Evidences

- (i) Shallow depth of lagoons of Atolls
- (ii) Absence of cliffs along coral island validates the idea of subsidence of land
- (iii) coast of island of Pacific ocean have raised beaches are devoid of barriers and Atolls
- (iv) Thickness of coral reefs increase downward

Remarks

Criticism

- ① If At Fringing Reef, Barrier Reef and Atolls are same process, then how are they found together e.g. Naisai Islands of Fiji
- ② Acceptance of this theory should lead to submergence of all islands in Pacific.
- ③ Darwin did not explain what cause subsidence (No Plate tectonic theory then)
- ④ Existence of coral on some emergent island e.g. Aldebra Island.
- ⑤ No evidence of subsidence of Australia to suggest the formation of Great Barrier Reef.

However it is an important theory which was also supported by W.M. Davis.

Answer the following questions:

- (a) Indian ocean is half an ocean, hence the behavior of the North Indian Ocean Currents is different from that of the Atlantic or the Pacific Ocean Currents. Discuss.
(250 Words) (20)
- (b) 'Structure is a dominant control factor in the evolution of the landforms'. Elaborate with suitable examples.
(200 Words) (15)
- (c) How geomorphology is useful in hazard management and in the urbanization. Discuss in the backdrop of some recent hazards.
(200 Words) (15)

Remarks

Remarks

Remarks

Remarks

Remarks

Remarks

Remarks

Remarks

* Answer the following questions:

- (a) What is Isostasy? Discuss the views of Airy and Pratt on Isostasy. (250 Words) (20)
- (b) Briefly analyse the difference in the models of slope evolution proposed by Davis and Penck. (200 Words) (15)
- (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)

(a) Isostasy refers to dynamic balance between standing features, depressed features of earth when seen in context of fast rotating earth. How this balance is to be maintained is the subject matter of Isostasy.

View of Airy

As per Airy, all the crystal columns are made up of Sialic masses and have same density and they are floating over Sima.

Thus all crystal columns have same density and they form ROOT.

12

Remarks

Airy: varying depth, uniform density

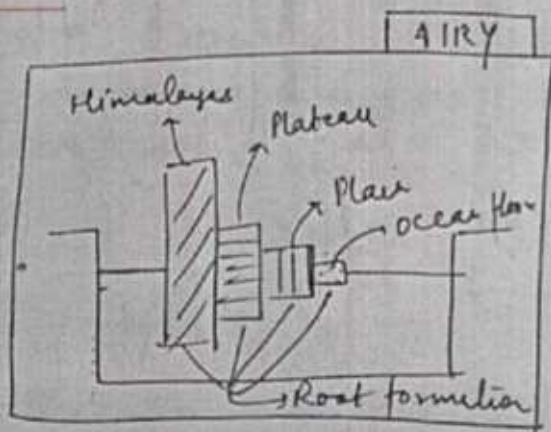
is time depending upon their mass which depends upon their height (since all have same density).

The degree/length of root depends upon height of the crystal column.
e.g. Himalayas will have deeper root as compared to plateau.

Criticism if this theory is accepted then Himalayas will have a root length of 81 km

by which depth it should melt therefore it is not totally accepted.

- JOLY supported the idea of Airy
PRATT

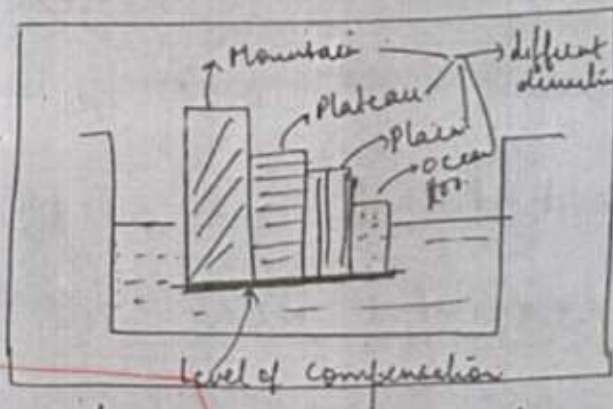


According to him, all crystal columns have different densities and all these different

density exist above the "level of compensation" below which all the variation in densities is compensated and no difference exist below LOC in densities

'Hollow mountains'

- Pratt also believed that



density of a crystal column $\propto \frac{1}{\text{height}}$ so density will

ocean floor (s) > Plain > Plateau > Mountain

Criticism

Halford and Bowie supported the idea of Pratt

It was Heiskanen who combined the ideas of Pratt and Airy to give a more applicable model of isostasy. He supported the idea of root formation of Airy.

and differential density of Pratt, but not only densities differed from column to column but also within the column as density increases toward the bottom.

(b) Davis and Penck gave two famous model of landscape this developed and embedded within the two model was idea of slope evolution.

DAVIS

PENCK

① Model called Slope decline

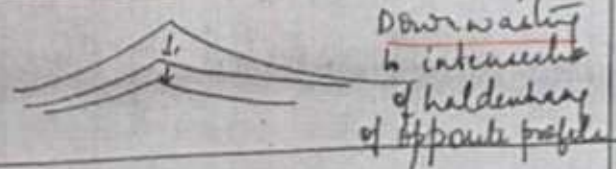
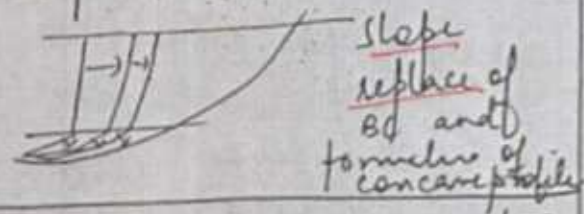
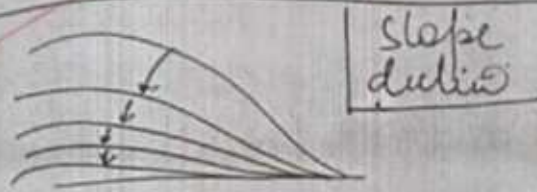
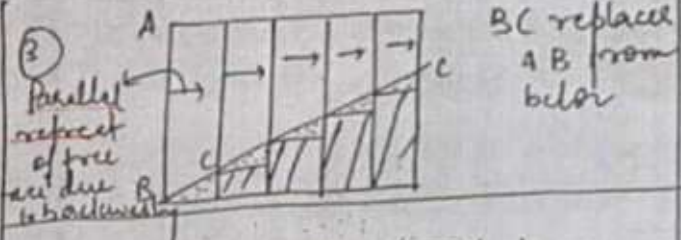
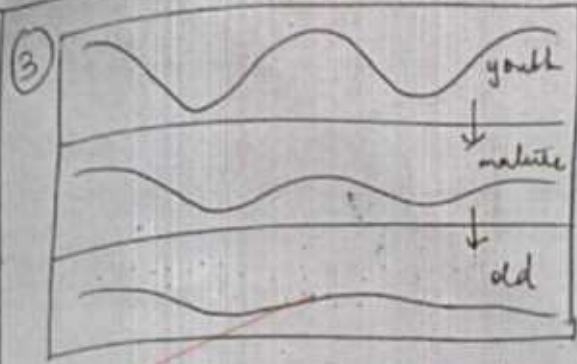
① Model called Slope Replacement theory

② Result slope decline happens due to "Downwasting" by weathering and erosion.

② Slope replacement is initially due to backwasting and later due to downwasting

Remarks

9
v good



① The end product is called Peneplain and has a convexo-concave profile

④ the end product is Endeuph and the has a a concave profile punctuated by an inselberg.

⑤ in slope evolution is the result of progressive and sequential change of landform through time time-dependent.

⑥ the slope evolution displays the value of intensity between force of variability and forces of uniformity time independent.

Remarks

⑥ Davis was criticised for assumption of rapid uplift and crustal stability

⑥ He was criticised by H. Mortensen that if rockfall did not happen instantaneously then theory becomes ineffective + as^m of equal erosion on all the far points of free face is wrong.

Question demands answer in the context of urban areas specifically

Recent Examples needed.

⑥ Geomorphology and disaster management are related as many disasters are

result of a particular geomorphology
dispensation eg. Himalayan earthquake are
caused by a particular geomorphical
make up.

Sendai Frameworks: banks upon 4-5
aspects:

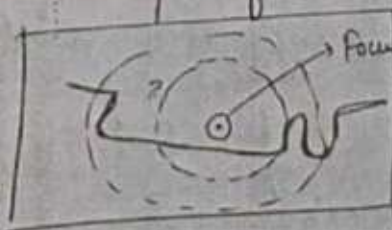
① Understanding Disaster Risk

② DRR (Disaster Risk Reduction) - structural
measures

③ DRR → Non-structural measures good

④ Capacity Building

⑤ All these 4 components can
be exemplified using concepts from the
information of geomorphology. Let's take
an example of case study of Earthquake in
Nepal in 2015.



Focus
Nepal
Earthquake

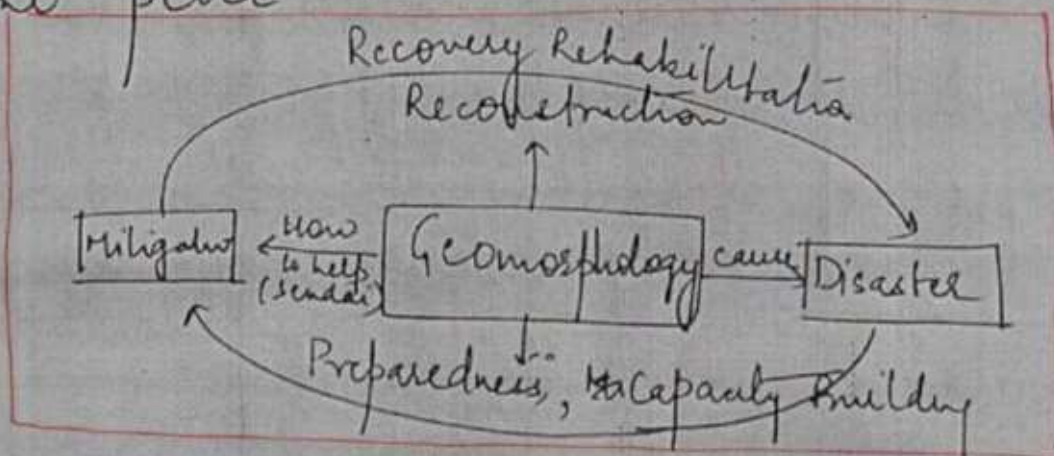
① Understanding Disaster Risk by analysing what caused earthquake in Nepal? Was it because of Plate movement or because of a reservoir e.g. Koyana earthquake

② DRR - Structural measure
What type of measure is a function of knowledge of geomorphology as we know that earthquake happen in Nepal so we must build earthquake resistant houses, create laws for that

③ DRR - Non-Structural measure - again with the collection of knowledge we create laws, institutions and personnel to empower effective management of hazard of earthquake in Nepal

④ Capacity differ on type of risk. With knowledge of geomorphology and risk associated with a particular area we can teach/prepare people for particular scenarios e.g. in case of earthquake hiding beneath desks, Mock drills etc

Thus we see each step to manage disaster is the function of nature of information about geomorphology of the place



Remarks

SECTION-B

Attempt all questions:

5. Write short note on following in not more than 150 words:

(10 × 5 = 50)

- (a) Ekman Transport
- (b) Write a short note on 'Development of Palimpsest Landscapes'.
- (c) Write a short note on 'Normal Cycle of erosion'.
- (d) Elastic Rebound Theory of earthquake.
- (e) Write a short note on 'Ocean deposits'.

Explain in the context of ocean currents. Mechanism of spiral transport with detailed diagram.

(1) Ekman Transport is the phenomena described by Ekman for movement of particles in fluid eg. Air movement and ocean.

It simply states that with increasing distance from the source of friction, whether ocean current movement or wind movement, Coriolis force acting differently resulting in differential movement of fluids.

4

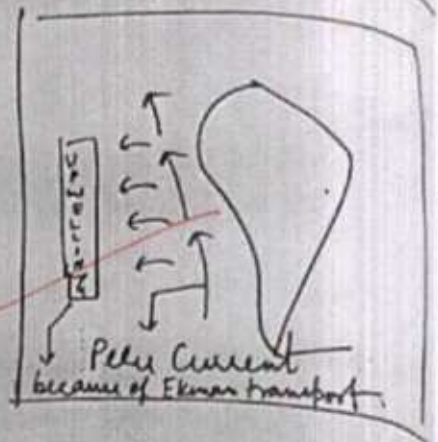
In ocean it indicates the "Net movement of ocean water" eg.

- Significance of Ekman Tx is also needed

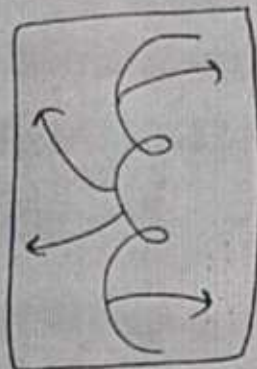
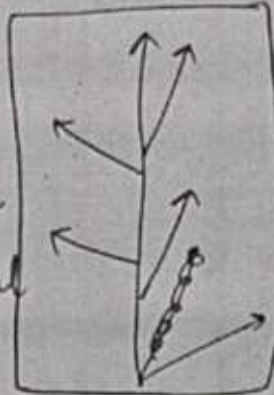
Remarks

With respect to air, the movement different as distance from the ground differs because of different friction level.

eg.



eg. different wind direction due to differential Coriolis force

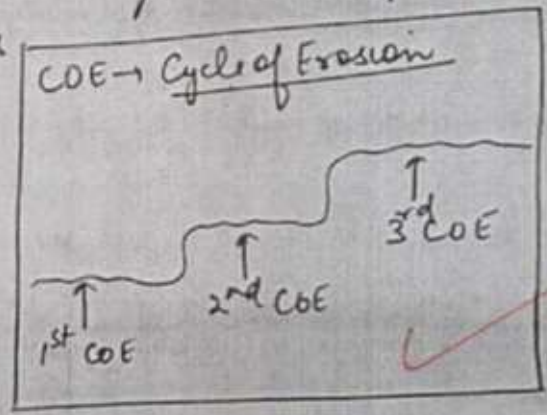


on account of differential frictional energy

Remarks

(b) Palimpsest topography is that topography that retains the imprints of previous cycle of erosion. It is a topography/landscape that has ^{been} written, erased and rewritten. *land development* *good*

It derived its validity from idea of "Historical evolution" of landscape by Davis' Theory of landscape Development. However, since it takes time for one cycle of erosion to be completed, it is usually not found.



6

as in Belan area near Allahabad we find 3 Erosional surface :

- ① Kaimur surface (1200m-1400m)
 - ② Panna (800-900m)
 - ③ Rewa (600-800m)
- All are part of different cycle of erosion. *good*

Benhi plateau

Technique include:

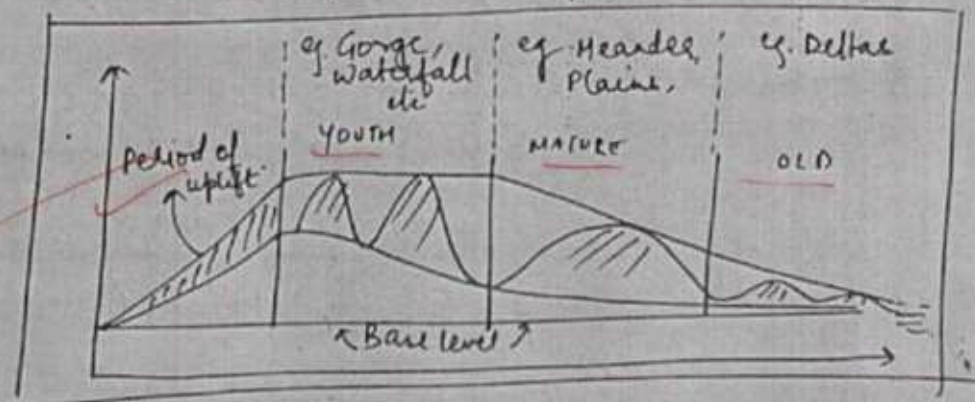
① Identifying Erosional surface

- (i) Altimetric frequency Histogram curve
- (ii) Superimposition
- (iii) Field check

② Dating using Radiometric dating, height correlation, sequence of sedimentation etc

However, many geographers believe the study of Palimpsest Topography to be a deductive and conjecture.

③ Normal Cycle of erosion was given by Davis using water as erosive agent as it is found in all the climates (Disputed by L.C. King)

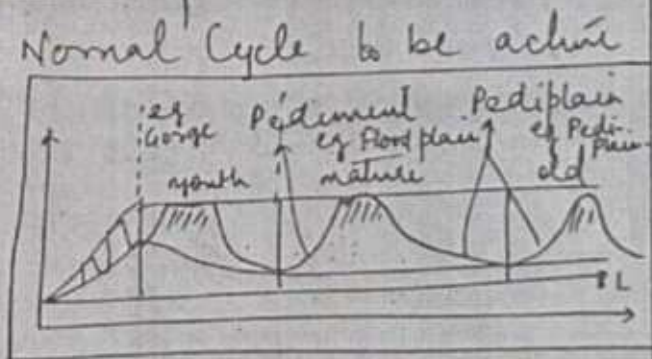


Remarks

youth stage	Mature stage	old stage
<p>Main work -</p> <p><u>Valley deepening</u></p> <p>(i) <u>Relative Height increase</u></p> <p>(ii) <u>Transporting capacity > material to be transported</u></p> <p>eg. Gorge, Waterfall and Rapid formed which recede headward etc.</p> <p><u>V-shaped valley</u></p>	<p>Main work -</p> <p><u>valley widening</u></p> <p>(i) <u>Relative Height decrease as absolute relief falls due to weathering and erosion etc.</u></p> <p>(ii) <u>Deposition also takes place and deepening of valley reduces</u></p> <p>eg. Meanders, levees, Flood Plains etc.</p>	<p>Main work</p> <p><u>DEPOSITION</u></p> <p>(i) <u>Relative Height of relief is least</u></p> <p>(ii) <u>Water divides almost null</u></p> <p>(iii) <u>Deposition leads to formation of Deltas etc.</u></p> <p>eg. <u>Ganga delta</u></p>

good.

LC King considered in And & semi And Area and he gave his own concept of Normal cycle of erosion based on experiences of Savanna region.



However it is still the Davis' cycle of erosion that command major acceptance.

Remarks

(d) Earthquake is the sudden shake of earth which leads to release of large amount of energy and loss of life and property

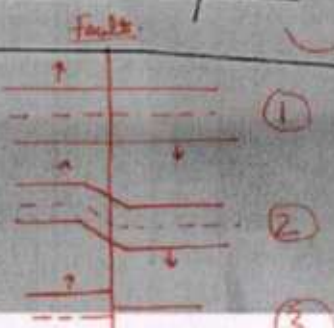
One the Elastic Rebound Theory of H F Reid argues: that rocks inside earth

(i) Rocks inside earth have elasticity
 (ii) Because of endogenic forces (press/pull), they are stretched (deformed)

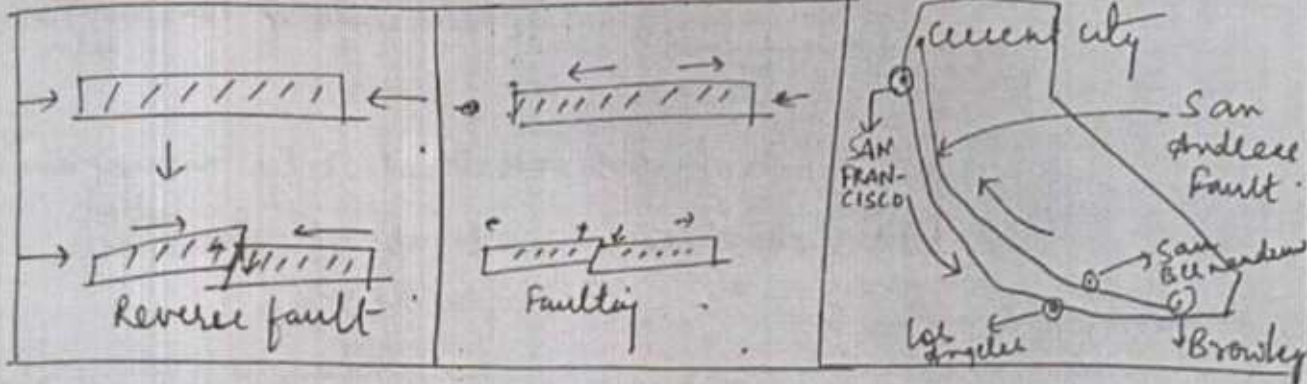
(iii) When the force of stretching exceeds elasticity of the rock, the rocks undergo breakage

(iv) the rock then try to attain the pre previous position it was at and this rebound of elastic rock to its original place of existence causes earthquake.

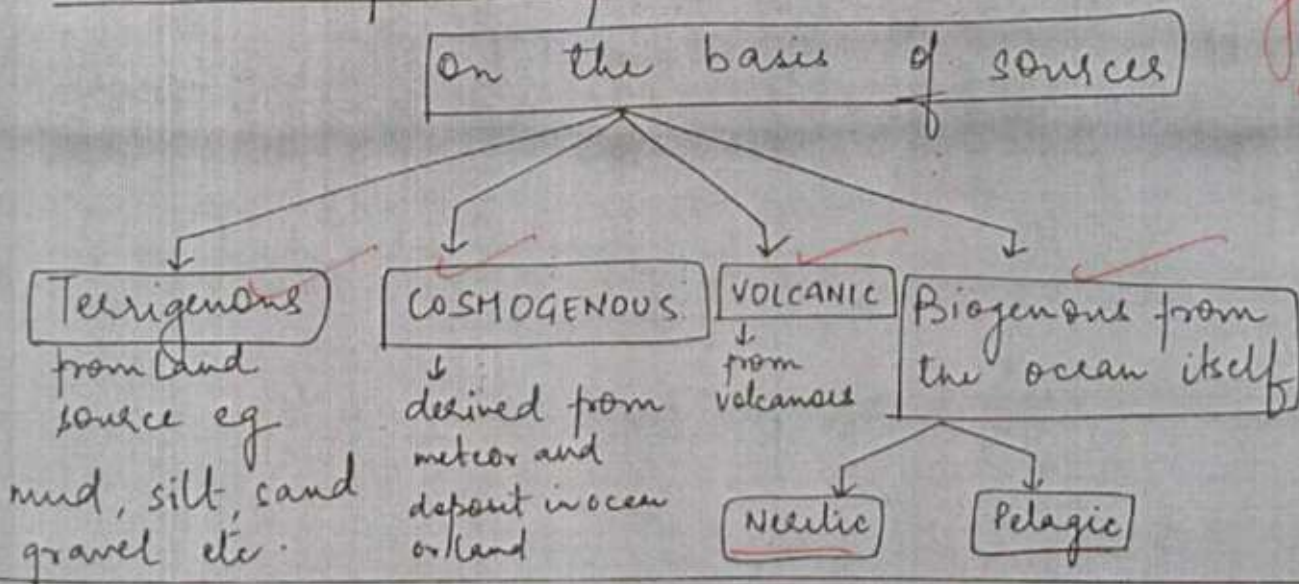
Remarks



H.F. Reid explains the San Francisco EQ of 1906 on the basis of this theory along the San-Andreas Faultline



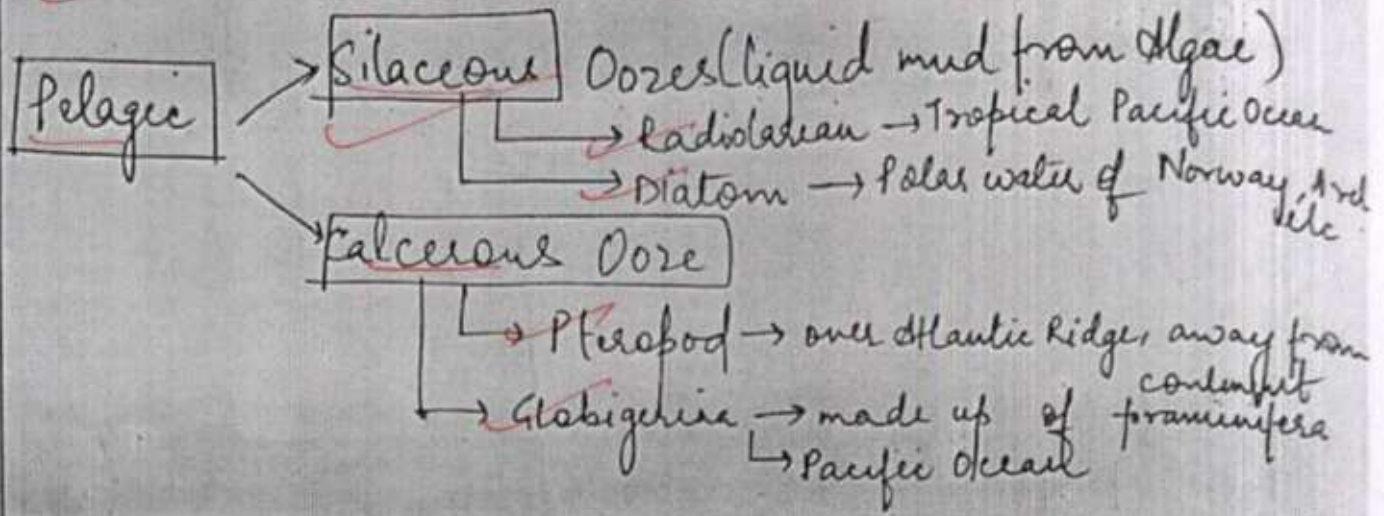
(e) Ocean deposits are unconsolidated marine deposits found on the surface of ocean ranging from Continental shelves, slope and deep sea plain:



7
good answer

Remarks

Neritic - from skeleton of plants and animal and at shallow water. eg Caribbean Sea



Importance

- (i) source of energy eg. Polymetallic nodules
- (ii) source of food for marine organism especially Diatom (i phytoplankton)



(iii) they affect the movement of ocean current and tides.

However, they have also led to conflict eg. over Exclusive Economic Zone over Polymetallic nodules or exploiting energy resources.

Remarks

Answer the following questions:

- (a) Explain the concept of polycyclic landforms and present an analytical study of the polycyclic landforms of any selected region. (250 Words) (20)
- (b) Write the difference between tidal currents and tidal bores. Discuss the importance and utilization of tidal currents. (200 Words) (15)
- (c) Discuss the various stages of formation of river valleys. Also discuss the major activities involved in their development. (200 Words) (15)

Remarks

Remarks

Remarks

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Remarks

Remarks

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Remarks

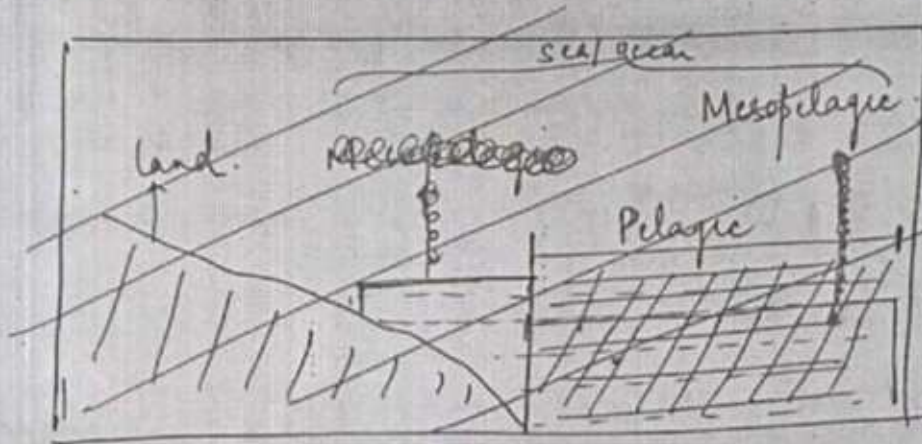
Remarks

Answer the following questions.

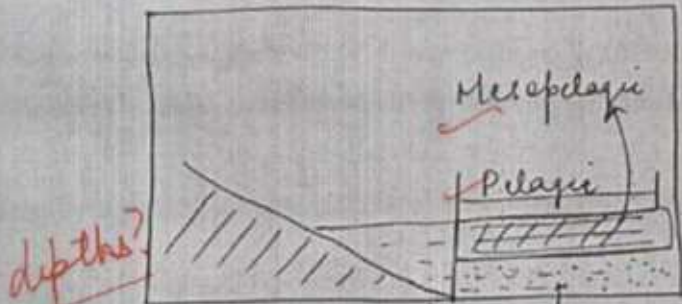
- (a) Any disruption to the abyssal ecosystem of the ocean significantly impacts pelagic and mesopelagic ecosystems. Discuss with respect to deep sea mining. (250 Words) (20)
- (b) Compare the views of W.M. Davis and Penck on the cycle of erosion. (200 Words) (15)
- (c) Discuss the Ocean plastic pollution problem and its effect over marine environment. How recent COVID-19 pandemic is intensifying this problem. (200 Words) (15)

PWM 2021

(a)



8
more clarity is needed



Abyssal ecosystem lies at the deepest level above which lies the Mesopelagic and above which lies pelagic system.

Bathypelagic

Now Abyssal ecosystem helps Meso and Pelagic system in many ways

- ① It is the source of nutrient for meso and pelagic system

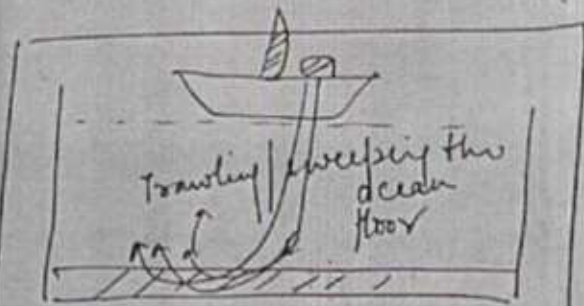
Upwelling

Remarks

- ② It houses many species which come to pelagic system for nutrition.
- ③ It influence ocean current and tides and waves which benefit pelagic system.
- ④ It is responsible for productivity of pelagic system which is necessary for food security of India.

Deep sea Mining happen in abyssal system wherein deep sea trawler or other machines are used to exploit the ocean floor for resources. This hasen mesopelagic and pelagic systems in many ways:

- ① It reduce the nutrient supply the of the mesopelagic and pelagic system.



Remarks

Disposes many tailings -
 disrupts sunlight + plankton
 growth → prevents the marine food chain.

leading to reduced production of food
 and this affect the meso and pelagic
 food cycle and food chain.

Establish close correlation

(2) It increases the turbidity of water,
 especially mesopelagic system which
 affect marine life badly eg. as happened
 in East coast of Sri Lanka.

(3) It leads to release of large volume of waste
 including microplastic which blocks the
nasal cavities of fishes and organisms

fish nose gills → mixing debris
 blocks the food trapping
 mechanism of organism

(4) It disturbs the distribution of
water temperature gradient between
 meso and pelagic system which hurt
 the ecosystem badly.

(5) Sound pollution of advanced machine hurt
 animal which use echolocation

Light pollution

(6) It will destroy the primary productivity
 (7) Many toxic radioactive metals buried are exposed

Remarks

which hurt animal life

SDG 14 - talk about life under water and we need to sustainable utilize ocean for inter-generational parity.

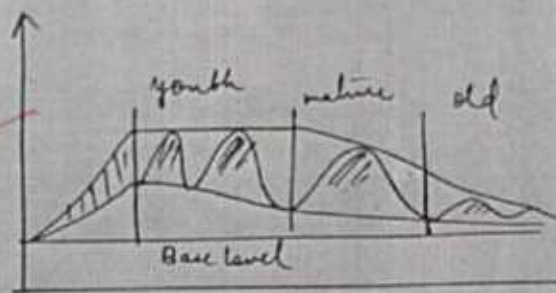
(b) Davis and Peck prepared two very famous model of landform development

9

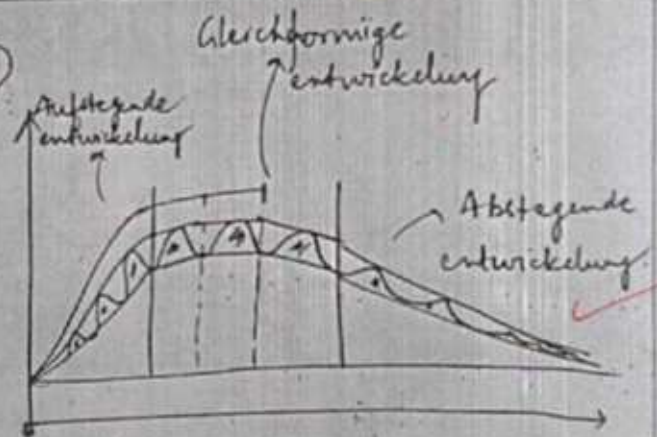
Davis

Peck

① Diagram



①



② Rapid period of uplift [shorter]
no erosion

② Initially slow, later rapid and long period of uplift. [longer]

Remarks

③ Erosion starts after Rapid uplift

③ Erosion starts as soon as upliftment occurs

④ Assume long crustal stability period

④ No such thing is assumed.

⑤ Time as a process to argue for slow and gradually and progressive change of landform from youth to mature to old.

⑤ Landform development is the function of the ratio of intensity of endogenic forces and exogenic forces.

(Historical development, Time dependent model)

(No historical development, Time independent model)

⑥ use of word "Stage"

⑥ use word "Phase"

⑦ End product → Peneplain is concave-concave in nature

⑦ End product → End rumpf → concave in nature

⑧ Peneplain once formed does not undergo change

⑧ Slope replacement keeps on start with every

⑨ Slope development through slope decline

⑩ Criticised for

① ass^m of long
crustal stability

② Erosion after upliftment etc

successive endemorph

⑨ Slope development through slope replacement

criticised for

① confusing terminology

② contradictory view

③ long ass^m rate of upliftment

However both theories are very important indicators in the development of geomorphology

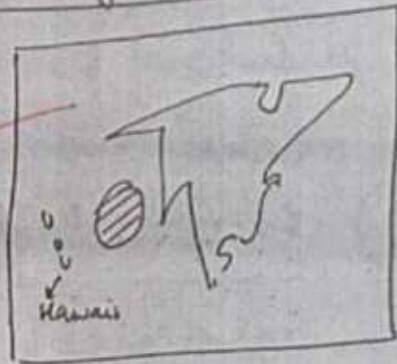
(c) Plastic pollution in ocean is the result of two sources - activities within ocean like cruise, drilling, deep

Remarks

X

see many etc and activities on land
like consumption, production etc
all these plastic enter ocean by river,
or estuaries etc. ~~The P~~

One such example of case
study is Great ^{Plastic} Pacific Garbage ^{Patch} ~~Zone~~ in
Eastern Pacific where plastic
as old as of 1960s is found.



Impact

(on marine environment)

- ① It get stuck on the nostril/fine/gills of marine organisms killig them.
- ② It enter food chain and then by process of biomagnification become dangerous for all food from ocean. (45% of global protein from marine sources)
- ③ It destroys the sea aesthetics of marine environment huelig tourism and source of income of people.

→ Affects productivity of marine ecosystems

(4) It destroys the nature of ocean water by changing ambient temperature and pressure and salinity condition of ocean

→ alters oceanic behaviour, subsurface upwelling

(5)

COVID 19 and plastic pollution

(1) Diversion of attention away from plastic pollution has led to increase in discharge into ocean

(2) Increased use of syringes / blood bags / medicine sachet and improper disposal

* has the potential to create new problem

(3) Des Increase because to mining mineral to supplement energy needs post covid 19 demand revival will lead to enhance plastic usage and problem

correlation?

SDG 14 talks about sustainable development of life under water and Plastic Waste Management Rules 2021 are in that spirit

Remarks

↑ packaging & delivery industry & pandemic ↓ plastic use

8. Answer the following questions:

- (a) What is geomagnetism? Explain and discuss the causes of geomagnetism and also explain how geomagnetism helps us to understand some aspects of the earth's crust?
(250 Words) (20)
- (b) The landforms formed in glacial and peri-glacial areas vary across space and time despite being proximately located. Discuss.
(200 Words) (15)
- (c) 'Oceanic water is saline, but salinity is not same everywhere'. Elaborate this statement with suitable examples.
(200 Words) (15)

Remarks

Remarks

Remarks

Remarks

Remarks

Remarks

Remarks

[Faint, illegible handwritten text]

Remarks