



**An Institute for Civil Services**

**IAS TOPPER'S**

**TEST COPY**

**KUNAL SHOTE**

**RANK - 640**

**GEOGRAPHY  
TEST- 1**



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**GEOGRAPHY****Time Allowed: 3 hr.****Max. Marks: 250****Instructions to Candidate**

- There are **EIGHT** question divided in Two Sections.
- Candidate has to attempt **FIVE** questions in all
- Question No. 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.
- 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 Question-Cum-Answer booklet must be clearly struck off.

1. Invigilator's Signature

2. Invigilator's Signature

Name Kunal Shroto

Mobile No. \_\_\_\_\_

Date \_\_\_\_\_

Signature \_\_\_\_\_

## REMARKS

GS SCORE

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**SECTION-A**

Attempt all questions:

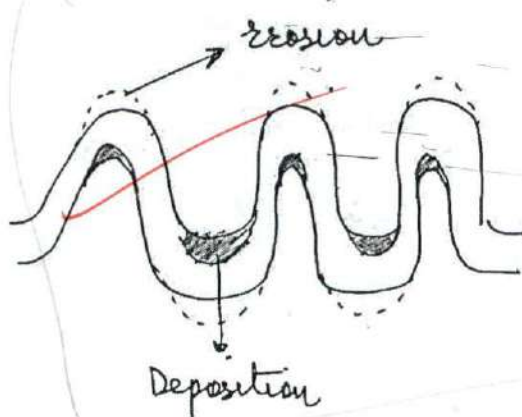
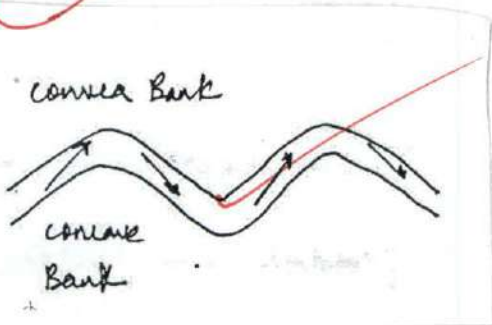
1. Answer the following questions in about 150 words each:

(10 × 5 = 50)

- (a) Write a short note on the contribution of Ancient period historians and philosophers in the evolution of geomorphological thought.
- (b) Write a short note on Bowen's Reaction Series.
- (c) Describe the terms in detail,
  1. Podzolization
  2. Gleying
- (d) Discuss the continental drift theory of Taylor.
- (e) Write a short note on Misfit meandering.

(e) Meandering is the phenomenon of channel morphology which adds sinuosity to the consequent (straight) river. This sinuosity is added due to continuous deposition and erosion along the concave and convex bank.

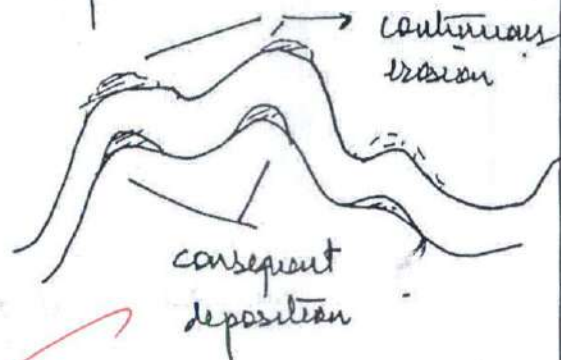
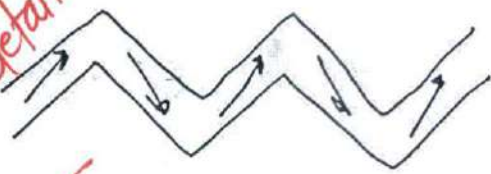
Could have arranged the definition better



Remarks



However when this alternate pattern of erosion and deposition is not sythemic, a phenomenon called misfit meanders occur.



Factors leading to misfit meandering

- Hard rock topography prevents simultaneous erosion and deposition.
- Erosional power of river enhanced due to river rejuvenation or fall in sea level.

Misfit meanders are common phenomenon in desert land during Pleistocene period. Eg Ghaggar river in Thar desert of Rajasthan.

Remarks

### ③ Podzolization:

Discovered by the Soviet scientist during their study of soil classification.

Podzolization refers to the soil layer formation on the parent rock.

Soil layer is formed due to

various exogenic geomorphic process on the parent rock. eg By fluvial action, wind action, anthropogenic activities etc.

D	Humus (organic content)
A	Humus + inorganic content
E	leached AL + Si
B	less organic, more parent rock
C	Remnant parent rock (fragmented)
L	Parent rock

Remarks

Could have explained to the point

Do not beat around the bush

1.1

Could have explained better

Not needed



(a)

~~Herodotus~~

- geomorphology earlier (during ancient)

period was understood as the subject of

History. Herodotus (father of history) study

rocks' ~~as~~ history to understand evolution.

Heratus (father of geography)

separated geography as a subject. This further

evolved into denudational chronology. This

topic was further build ahead by W M Davis

, Penck etc to assert the erosional cycle of erosion.

Ancient period historians briefly

understood the exogenetic forces (erosional)

Remarks

but failed to understand the endogenetic forces and its cause and effect. The concept of convective current remained mystery until sea floor spreading theory of Harry Hess in 1960.

Ancient period historians rocks (land for) as an living entity. This entity evolved over time. This thought inspired "Lebensraum" of F. Ratzel.

geomorphology as a subject has evolved over time and will continue to evolve to make our understanding of the earth better.

Remarks

These are not ancient period historians

you have just mentioned some random names rather than actual explanation



2. Answer the following questions:

- (a) What is geomagnetism? Explain and discuss the causes of geomagnetism & also explain how geomagnetism & its application help us understand some aspects of the earth's crust? (250 Words) (20)
- (b) It is said that the Holocene epoch which started at the end of the ice age has given rise to Anthropocene epoch. In light of the above statement discuss the significance of Anthropocene epoch. (200 Words) (15)
- (c) What do you understand by Social Forestry? Describe its role in sustainable rural development. (200 Words) (15)

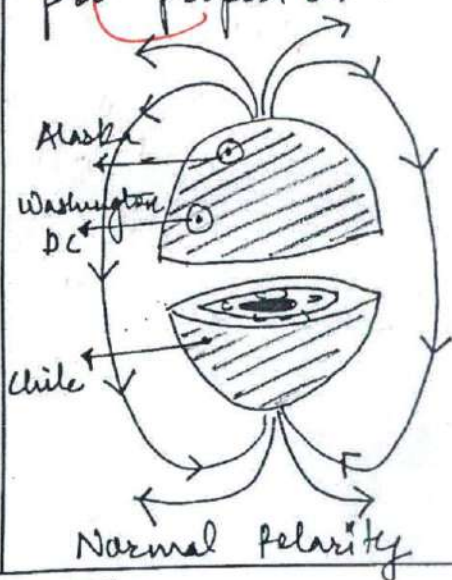
~~geomagnetism is also known as paleomagnetism.~~

~~Paleo means fossils and magnetism refers to magnetic property of fossils of rocks.~~

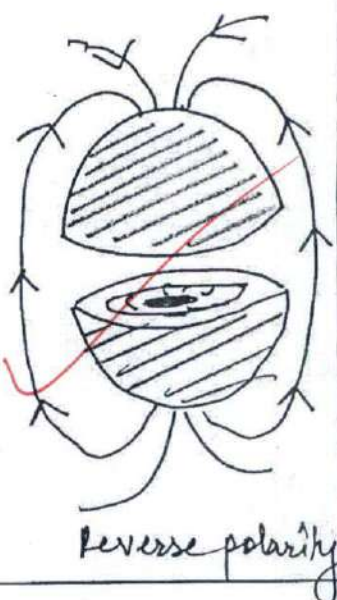
~~The Basaltic and granite rocks contains~~

~~elemental iron which gives them magnetic~~

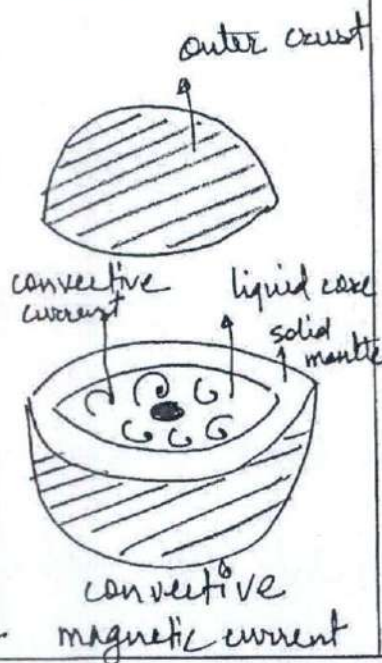
~~propertier.~~



Normal Polarity



Reverse Polarity



Remarks

magnetism inside the earth<sup>is</sup> formed due to electro dynamo magnet. The liquid outer core rotates with respect to the solid inner mantle.

This generates ~~elec~~ electricity. This electricity further produces magnetic effect.

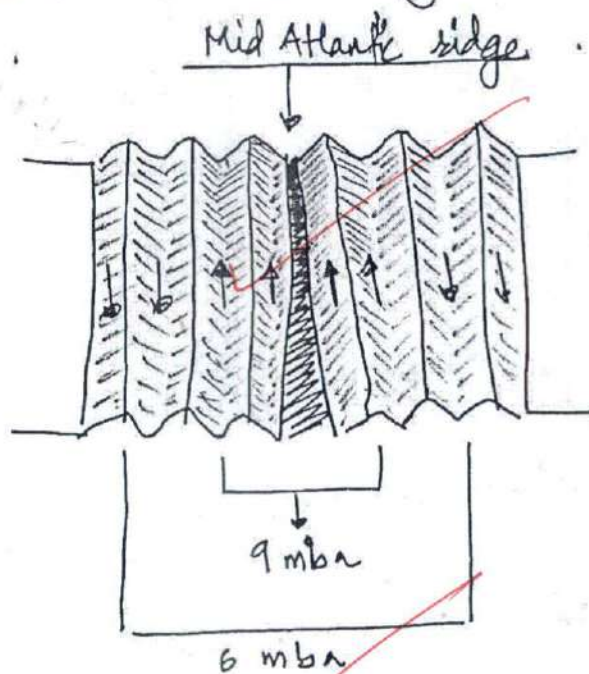
This magnetism ~~reverses~~ after few million years. Theories of reverse polar polarity are :-

- ① Change in properties of liquid core material due to radio active decay.
- ② sudden stopping of electro dynamo due to asteroid strike or massive earthquake or volcano.

Remarks



This reversal of polarity helps understand the age of rocks and reversal in polarity of rocks along the mid oceanic ridges.



mba  $\rightarrow$  million years ago

How? understanding the reversal and movement can help us predict the occurrence of earthquakes and save disastrous consequence to human life

Remarks

Could have added more points  
Refer model ans

⑥

*Could have been better ended  
No need to write about pleistocene*

Pleistocene age also known as ice age ended 2.5 million years ago. This was the start of Holocene epoch. This was the period of warming of earth temperature, glaciers receded, sea levels ~~to~~ raised.

However, since early 19<sup>th</sup> century  
the amount temperature rate of increase of  
global temperatures have substantially increased.

After the invention of steam steam engine  
and subsequent industrial & revolution,  
carbon dioxide emission has risen exponentially

Remarks



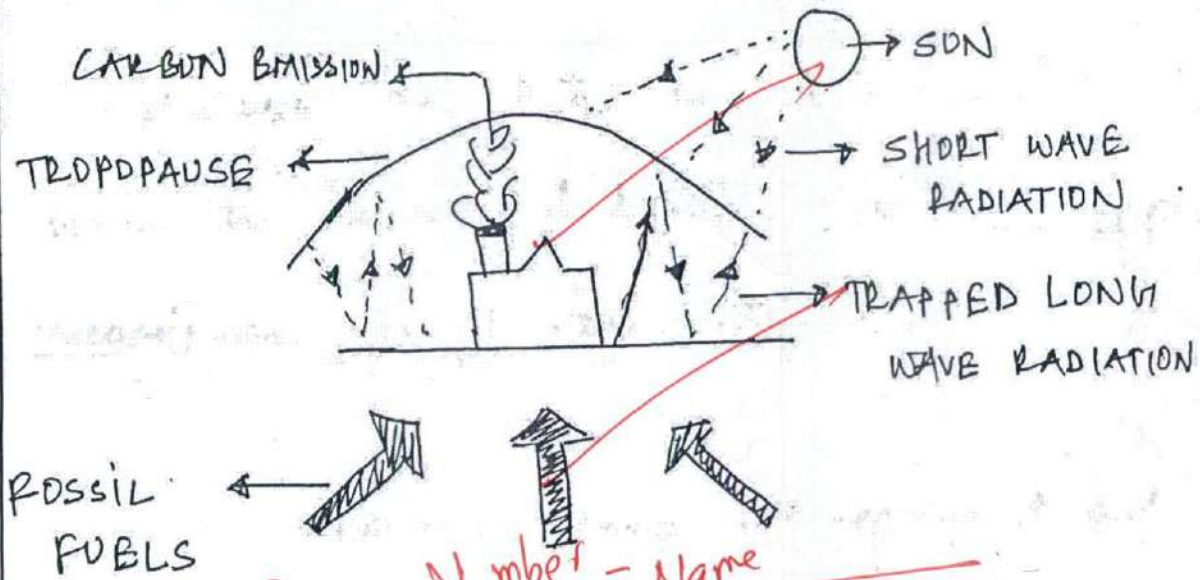


Figure Number - Name

6.5  
This excess amount of carbondioxide trap the long wave radiation and increase the heat budget of the earth. This rapid transformation of earth atmosphere has given rise to anthropocene epoch.

The dating of anthropocene epoch can also be started by ascertaining the dates of fossils been found at Mammoth cave in

Remarks

You could have added more relevant points

Meghalaya. This dates around the period when the human civilization was in Harappa Mesopotamia; Egypt was destroyed.

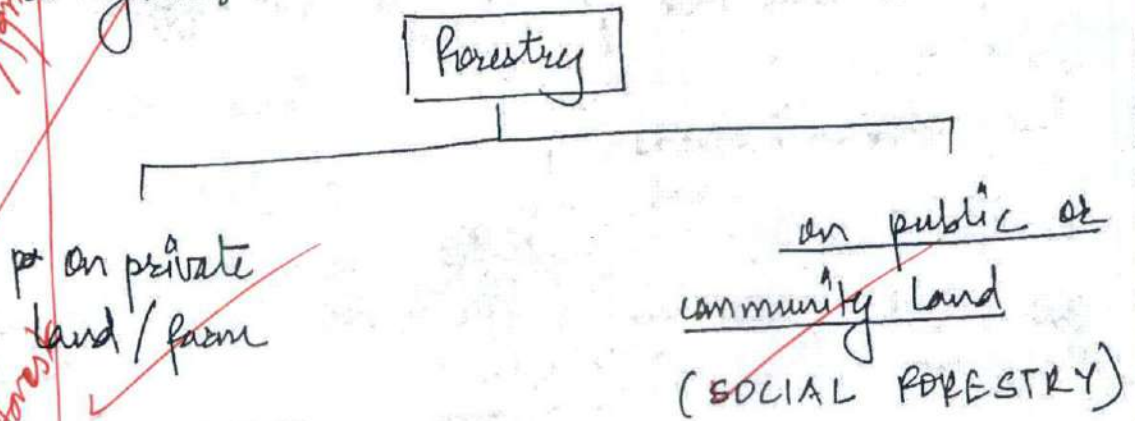
However, many anthropologist and geographers are of the view that the beginning of Industrial revolution in Europe was the reason for advent of Anthropocene epoch.

good

Remarks



Forestry can be divided into two broad categories.



Trees grown by community over public

land for both environmental and aesthetic

purposes is known as social forestry.

social forestry gained popularity after the second world war with the rise of New Environmentalism.

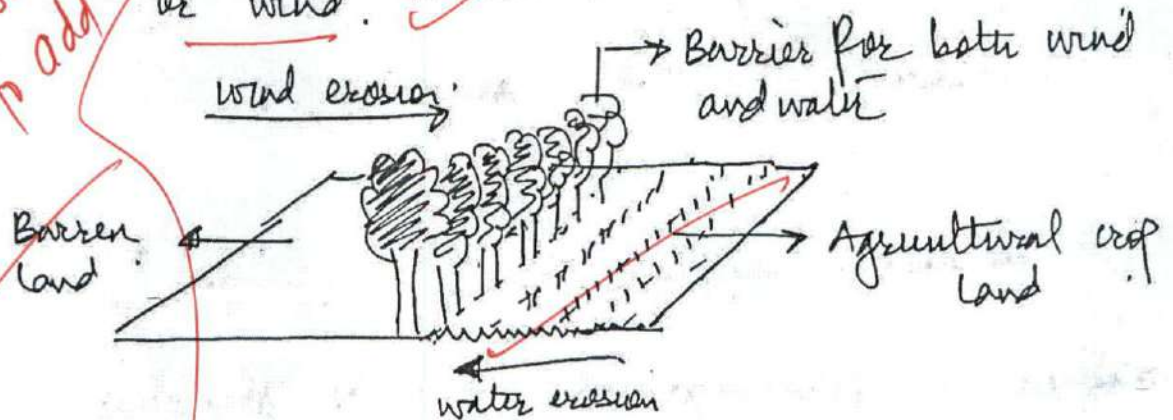
Remarks

*The concept of social forestry was emerged in 1975 National Commission on Agriculture. The concept is based on the principle of sustainability where forests are entrusted to be protected with the participation of people.*

*Yogur*

## Role in sustainable rural development

- ~~Can~~ Trees planted around farm land can stop the erosion of soil due to water or wind.



- Trees provide minor forest produce for tribal communities. Eg: Nagas, Meitais, Jangs (Chotanagpur plateau) dependent entirely on forest produce.
- Trees provide ~~enormous~~ enormous environmental benefit by purification of surrounding air.

Remarks



However, there are certain issues involved

- Maintenance of trees is a huge task.

eg: Acacias have been planted several  
times however lack maintenance.

- Trees surrounding farmland feed on  
nutrients of crops leaving crops vulnerable  
to food.

Social forestry has remained an important  
aspect of human rural life. Efforts should be  
undertaken to achieve further greening and  
their maintenance.

Remarks

*It does not look like optimal answer*

*Answer is bit general*

3. Answer the following questions:

- (a) The complexity of geomorphic evolution is more common than simplicity. Elaborate. (250 Words) (20)
- (b) Discuss the Morisawa's unified classification of channel pattern. (200 Words) (15)
- (c) Plastic is considered as "Chemical of emerging concern". In light of the given statement discuss the impact of plastic on the soil and human health. (200 Words) (15)

① George Cuvier was of the opinion that complex land forms are more common ~~that~~ than simple land form.

Simple landform is the landform which has undergone only single cycle of erosion. Complex landforms are poly cyclic land form. (undergone several cycles of erosion)

while considering the cycle of erosion, climate change plays a significant role. During Pleistocene period (2.5 million years)

Remarks

The flow of your answer is missing



the deserts of today ~~are~~ were either covered with ice or received significant rainfall. Therefore they were subject to either glacial or arid cycle of erosion. Similarly glacial evidence are also found in Brazilian plateau, ~~and~~ Madagascar and Australian desert.

However there are certain exceptions like Ural mountains, Atlas mountain which have undergone single cycle of erosion but the complexity of geomorphic evolution is more common than simplicity.

Remarks

Could have explained more

Refer model answer for more points

Again answer is correct

b

⑤ channels can be classified into channel types and channel pattern.

### channel types

① Bed rock channel:-

- Hard rock underneath river
- channel erosion is slow and straight
- channel found in majority -

② Alluvial channel

- Typically found along alluvial depositional plain region.
- soft soils, various patterns of channel channels are formed.

Remarks



## channel pattern

Depending upon the sinuosity of the river channel, Meade & Meade classified the pattern into 5 types

pattern  
~~straight~~  
~~sinuous~~  
~~meandering~~  
~~Braided~~  
~~Anastomosing~~

Sinuosity (SN)

~~$SN < 1.03$~~

~~$SN > 1.03$~~

~~$SN = 2$~~

~~$SN < 1.5$~~

~~$SN > 1.5$~~

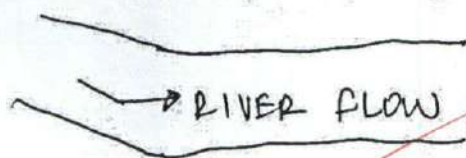
straight

- low amount of erosion and deposition along concave and convex bank  
 eg Ganga river system

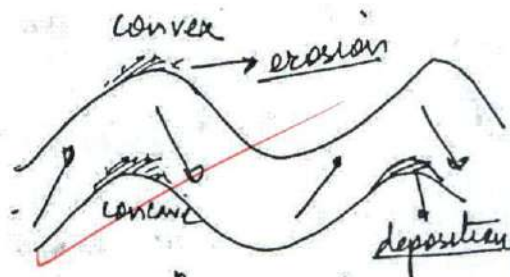
sinuous meandering

- significant erosion along concave bank and deposition along convex bank  
 eg: Amazon river.

Remarks



straight



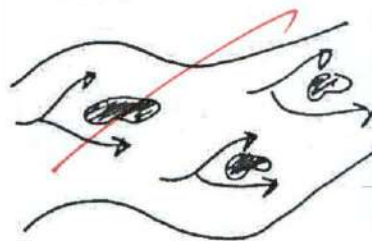
Sinuous/  
Meandering

8

Braided channel

The deposition in the course of river are not fixed, they are constantly readjusted  
eg: Colorado River (USA).

Braided channel

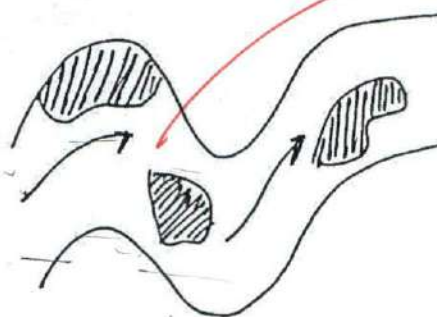


Anastomatic channel

The deposition ~~of~~ along the course specially due to growth of weeds and trees

eg: Brahmaputra river

Anastomatic channel



Remarks

good

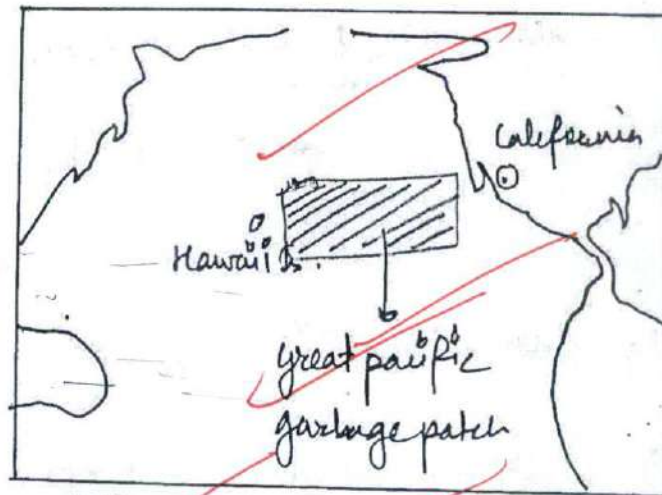


⑦

Plastic is the byproduct of petroleum refining. It is non biodegradable, synthetic and has been a menace in recent times.

Majority of plastic is either dumped in landfill or finds its way to the ocean.

This has given rise to Great Pacific garbage patch in Pacific ocean.



Great Pacific Garbage Patch between Hawaii Island and California

Remarks

One United Nation report estimated that by 2050, there would be more plastic in ocean than the biomass of fish.

Impact on human health and soil

- Leaching of harmful chemical from plastic landfill contaminate the soil.
- This contaminated soil transfers harmful chemicals like Bisphenol-A (BPA) enter to crops and food system.
- Microplastic from PET bottles, toothpaste, cosmetics can cause various types of cancer.

Plastic is truly the chemical of emerging concern. India's goal to eliminate single use plastic by 2022 is step in right direction.

Remarks

Could have added more points  
Your answer is missing the relevant diagram



## SECTION-B

Attempt all questions:

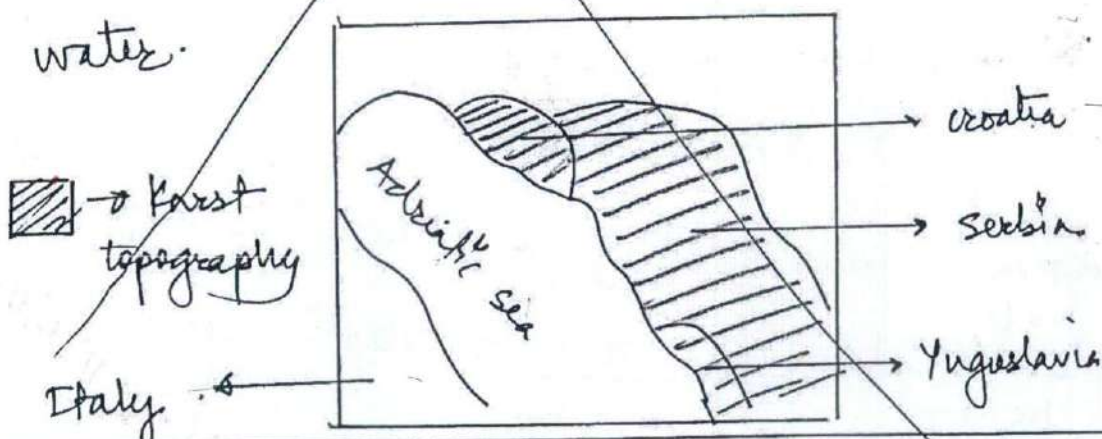
5. Comment on the following into 150 words:

(10 × 5 = 50)

- (a) Explain various theories put forward by various geomorphologists regarding the formation of limestone caves.
- (b) Explain the process of Nivation and Frost Heaving.
- (c) Write a short note on the tectonic-geomorphic model of M. Morisawa
- (d) Write a short note on Cymatogenic Movements suggested by L.C. King.
- (e) Why Continental Drift theory is also called as an impossible hypothesis?

⑤ Limestone caves are also known as Karst topography. Named after the place in Yugoslavia where it is found in abundance.

Limestone caves is formed due the dissolution of basic ~~to~~ calcium carbonate after reaction with acidic rain or surface water.



Remarks

~~Explain~~

⑥ The process of Nivation and Frost Heaving is the type of weathering dependent upon the anomalous behaviour of water.

How can water convert into ice at  $4^{\circ}\text{C}$  ?  
The expansion of water when cooled below  $4^{\circ}\text{C}$  ~~and~~ due to formation of ice is responsible for hydration weathering.

Nivation refers to the filling of cavity in rock with water and frost heaving refers to the weathering of rock due to ice formation.

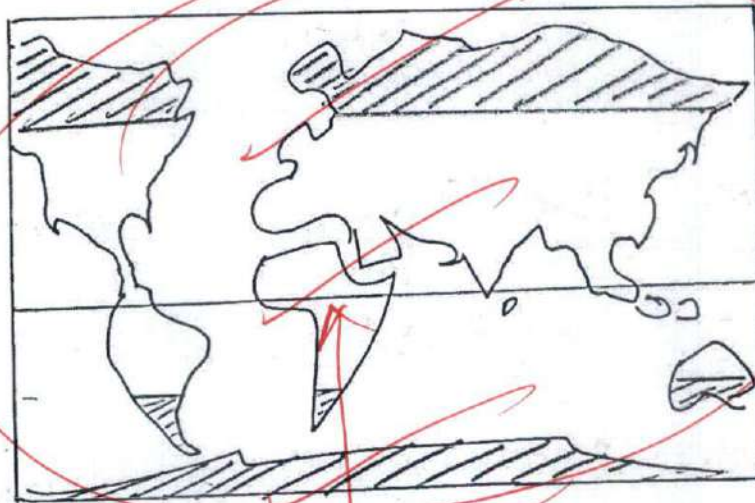
Your concept here is not much clear.  
Refer model answer

Remarks



Such of weathering typically found in  
Targa and Tundra climate region with abundance  
of precipitation combined with sub zero climate.

Such type of weathering is also  
found in tropical and temperate region when  
they were covered with ice during Pleistocene  
period.



▨ - Distribution of Nitration and Frost heaving  
weathering

Remarks

Diagram is explanatory  
enough label it

② Continental Drift Theory was propounded by Alfred Wegner (1912) to explain the movement of plate in globe & earth crust in geological past and the present arrangement of continents.

Wegner provided evidence supporting his hypothesis in form of jigsaw arrangement of continent and several paleontological evidence.

However, Wegner's theory is called an impossible hypothesis due to explanation of forces involved in movement of earth crust.

Remarks



The northward movement according to Wegner was due to gravitational attraction at equator. However, it is now known that gravity is a weak force and could not possibly have moved the heavy and dense crust.

Similar is the case with western westward movement, tidal forces are effluent to ~~move~~ move the crust.

After the convective thermal current advocated by Harry Hess and WT Morgan, continental drift was called as impossible hypothesis.

Remarks

Without relevant diagram you will never get good mark. even if your explanation is good

7. Answer the following questions:

- (a) Discuss the view of Airy and Pratt regarding the concept of Isostasy. Also, give the interpretation of the theory of plate tectonics. (250 Words) (20)
- (b) What is a Zoogeographic region? Provide a classification of major Faunal regions of the world and discuss Ethiopian Faunal Region and Oriental Faunal Region in detail. (200 Words) (15)
- (c) Write a short note on various factors causing rejuvenation in landforms and thus describe the consequent landforms. (200 Words) (15)

(a) concept of Isostasy was first given by Dutton explaining the floating or arrangement of continental crust over the oceanic crust.

however, this theory was further modified by Airy and Pratt explaining the arrangement of various landforms (high mountains, plateau, shield) and their respective balancing on earth surface.

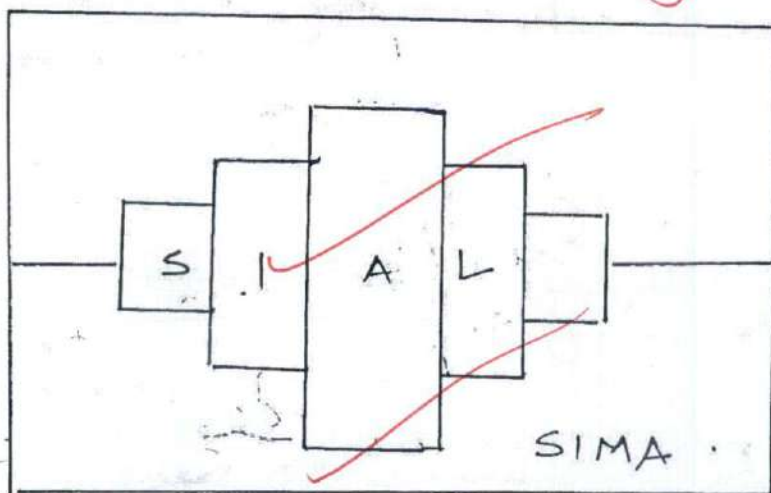
Remarks



They were of the opinion that  
all rocks of same density are found together  
and they come together to form a  
landform.

6 The height of The density of good  
material being same the heavier (larger)  
rock is higher than the smaller rock.

The height equals extends beneath the  
surface in ratio of 1:9.



you have not  
explained  
the theory of  
Pratt

Remarks

According to plate tectonics as the convergent plates come together, upheaval of landform disrupts equilibrium ~~there~~.

To balance this upheaval, new roots are formed and ratio of 1:4 is maintained

Criticism

- The dept of crust is 30-200 km, ratio of 1:4 is inappropriate for large mountain like Everest.

- ~~to~~ Rocks of a landform are rarely of similar density.

Despite all these criticism, Airy and Peatt were first one to propound the theory and develop concept of isostasy.

Remarks

Most of your answers are written in bits & pieces. Try to write in a single flow.



⑥ Regeneration is defined as the rebirth or revival of cycle of erosion. This rebirth of cycle of erosion is caused by following factors.

① Volcano or any endogenetic landforms upliftment in the mature stage of cycle of erosion

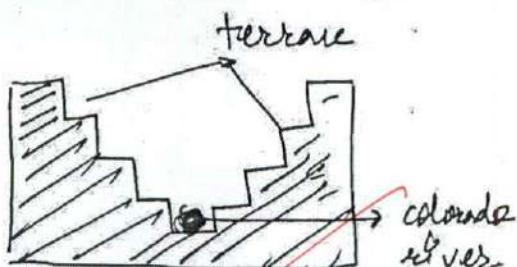
② Drop in sea level, leading to revival of erosion.

③ Increase in erosion capacity of river due to change in water flow and channel morphology.

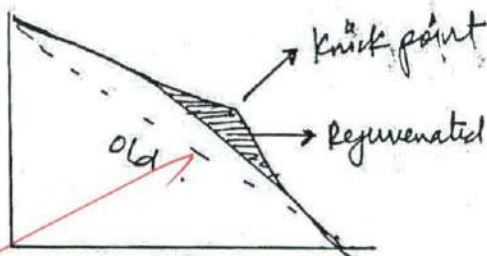
You could have drawn diagram

Remarks

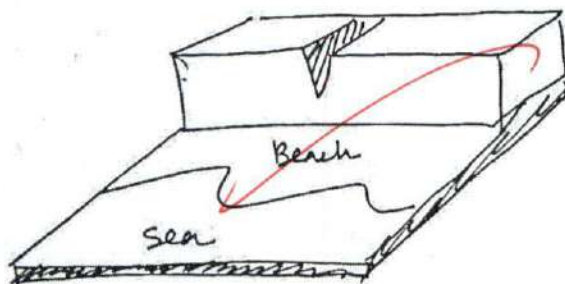
## Landforms developed



Steps like river  
terrace.



Rejuvenated river  
valley.



Rejuvenated coastal valley.

✱ understanding of rejuvenated landform helps us understand various landform and phenomenon like river cutting. Penck's model of cycle of erosion briefly explains rejuvenated landform.

Remarks

guy



