

GEOGRAPHY
Online Test Series Programme



ANSWER BOOKLET COPY (1 - 29)
(MAIN) EXAMINATION

TEST - 1

Subject : _____
Answer Medium English

Name : SAUMYA PANDEY

Topic : Physical Geog (I) Paper / Test Number: 1

Examination Date: _____

Registration No :
TSPO

Student Signature: _____

Test Timing : 11:30-2:30 pm

E-mail id : sa _____@mail.com

INSTRUCTION

- Answer must be written in specified medium
- The Test is for 250 marks and 3 hours time
- You must download the Question-Cum-Answer
- Answer attempt the test , scan the booklet and mail it back latest by Wednesday
- Suitable sketches , map and diagram should be made with answer
- **Evaluted answer sheet will be mailed back to you by thursday**
- Coloum 1 and 2 are for regular & Non regular students respectively

Important : Pages left blank are to be stuck out. Any Answer that follow pages left blank may not be given credit.

Question Paper Specific Instructions : -

Please read each of the following instructions carefully before attempting questions

There are **Eight (8)** questions printed in English.

Question 6 (Six) is compulsory. In total Seven(7) Questions to be attempted

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, as specified, should be adhered to.

Any page or portion of the page left blank in the answer book must be clearly struck off.

Q.No	Marks Given
1.	
2.	
3.	
4.	
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Total	

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TEST - 1
GEOGRAPHY

Time Allowed : Three Hours

Maximum Marks : 250

- Ques. 1. (a) Elaborate on cycle of landmass denudation in humid climate. 10 Marks
(b) Examine crustal upliftment in content of isostasy. 15 Marks
(c) Explain types of fog in reference to formation process. 10 Marks

- db Ques. 2. (a) Write note on interrelation between atmospheric disturbances. 10 Marks
(b) Discuss the difference between miogeosyncline and polygeosyncline. 10 Marks
(c) Avail an account of terranes and magma plumes in modifications to plate tectonic theory. 15 Marks

- Ques. 3. (a) Examine the process of mode and rate of slope retreat. 10 Marks
(b) Write note on geothermal gradient in earth's interiors. 10 Marks
(c) Discuss the profile of planetary and latitudinal heat budget. 10 Marks
(d) Economic geology 5 Marks

- Ques. 4. (a) Write note on relief and its order. 10 Marks
(b) What is meant by seismicity? 10 Marks
db (c) Discuss the elementary difference between laminar and turbulent stream flow. 15 Marks

- Ques. 5. (a) Elaborate on global precipitation pattern in context of air mass effectivities. 10 Marks
(b) Explain the concept of vulcanicity and discuss vulcanic landforms. 15 Marks
db (c) Elaborate on concept of stratigraphy. Also highlight its limitations. 10 Marks

- Ques. 6. (a) Examine Runcorn's contribution in revival of continent drift theory. 15 Marks
(b) In light of coastal erosion, examine the major controller of erosion. 15 Marks
(c) Avail the details of alluvial river actions. 10 Marks

- Ques. 7. (a) Examine the structural controls in landform development. 10 Marks
(b) Avail a brief description of rejuvenation. 10 Marks
(c) Explain mass movement and identify its types. 15 Marks

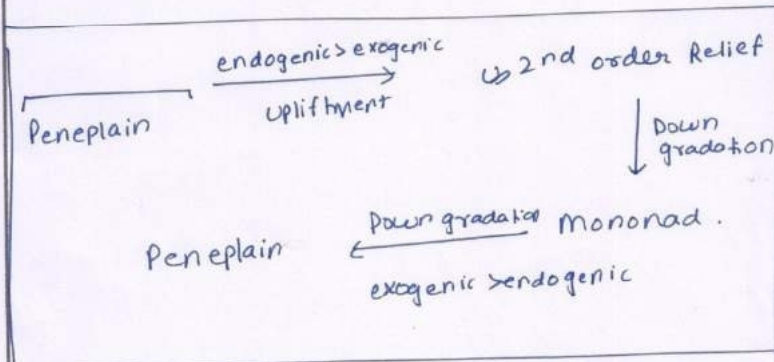
- Ques. 8. (a) Discuss characteristics of earth as a geological system. 10 Marks
(b) Examine different types of drainage pattern with suitable examples. 10 Marks
(c) Comment on types of erosional surfaces on the basis of the development mechanism involved. 15 Marks
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Que.1 (a) Elaborate on cycle of landmass denudation in humid climate.

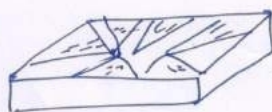
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Ans. Cycle of Landmass denudation refers to the basic geomorphological principle of uniformization which is a result of interplay of endogenic and exogenic forces.

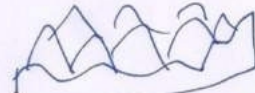


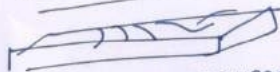
In humid climate, following denudational/erosional cycle plays out -

1)  Initial stage: Relief is slight, poor drainage

2)  Early youth - stream valleys are narrow, uplands broad and flat

3)  Late youth - valley slopes, interstream uplands

4)  Mature - valley slopes, narrow divides

5)  Late maturity - subdued relief
 (Contd.)
 6) Old stage -> monad rocks => Regeneration (next cycle)

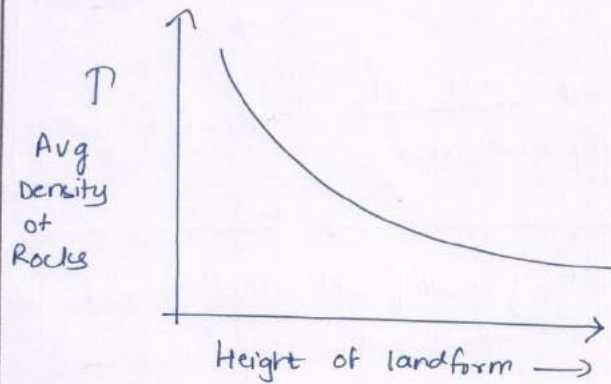
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Que.1 (b) Examine crustal upliftment in context of Isostasy.

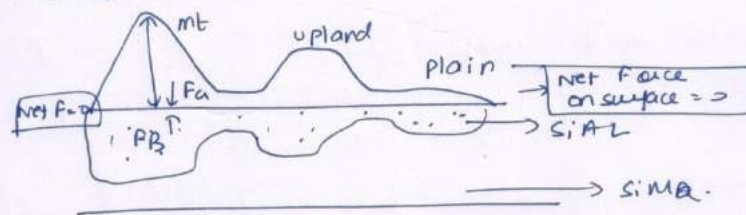
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Ans. Isostasy theory refers to the mechanical stability of an upstanding masses on earth's crust i.e. stable equilibrium of 2nd order relief with respect to endogenic forces inside the earth.

Crustal upliftment in context of Isostasy



(i) Atsy's views:



Height of landform \propto Depth of SiAL.

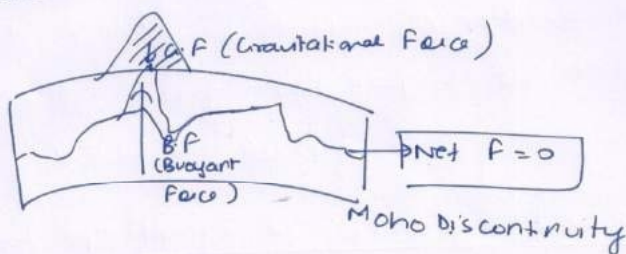
(ii) Pratt's views: (net force on line of compensation = 0)

\therefore overcrustal and undercrustal masses are

Enter Question No

inversely proportional to each other.

(iii) Heiskanen's views - variable line of compensation.



Thus all views on isostasy underline the fact that as crustal upliftment takes place, the depth of SIAL below crust increases and higher 2nd order relief are made of less dense rocks.

Que. 1. (c) Explain types of fog in reference to formation process.

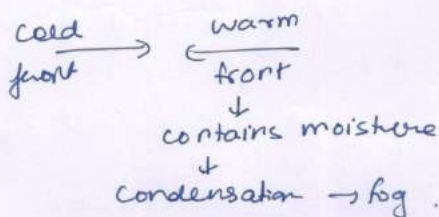
Ans. Fog is a form of near surface condensation formed in colder seasons, due to presence of dust particles and SPM in lower layers of atmosphere (act as hygroscopic nuclei).

Different types of fog in reference to its formation process -

① Radiation Fog - due to thermal inversion in winter night

② Frontal fog:

(200-250 mts above surface)



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write anything in the margin

③ valley or Topographic fog - due to temperature inversion in valleys during night

④ Advection fog - warm
westerlies wind → condensation
→ mt slope
Eg: Alps

⑤ Presipitatal fog - due temporary phenomena
in nights over water bodies

⑥ Smog = smoke + fog (SPM > DUST)

⑦ Photochemical smog

⑧ mist and haze (more visibility than fog)

Que. 2 (a) Write note on interrelation between atmospheric disturbances.

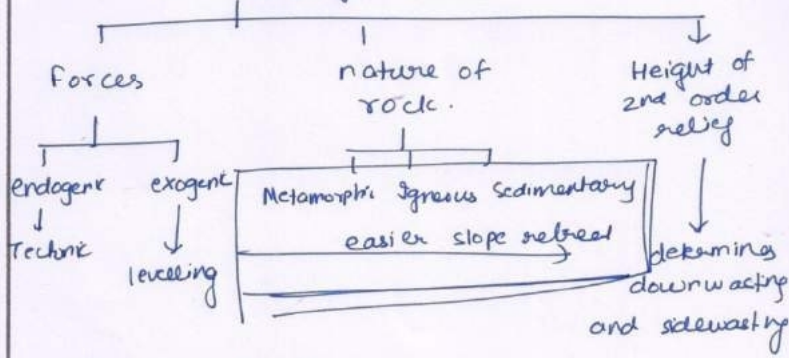
Ans.

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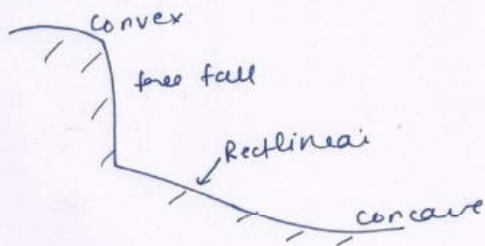
Que. 3 (a) Examine the process of mode and rate of slope retreat.

Slope genesis, development and retreat refers to measurement of vertical irregularities in angles in slope.

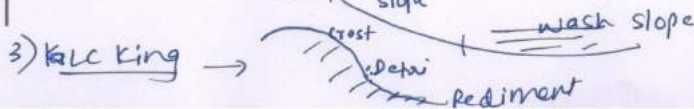
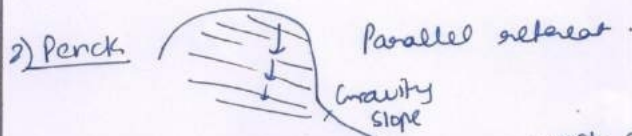
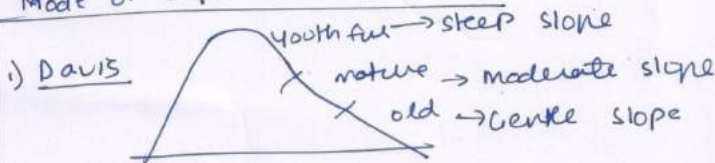
Factors changing slope



Elements of slope



Mode of slope development -

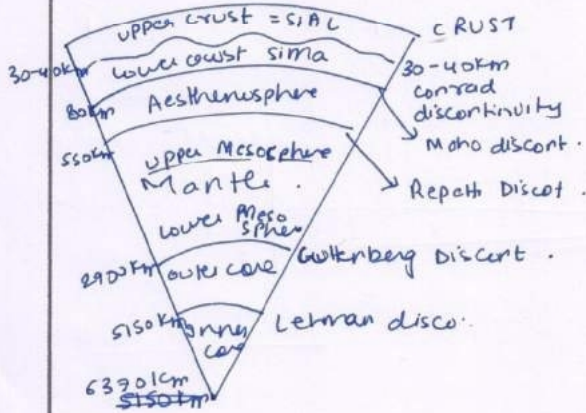


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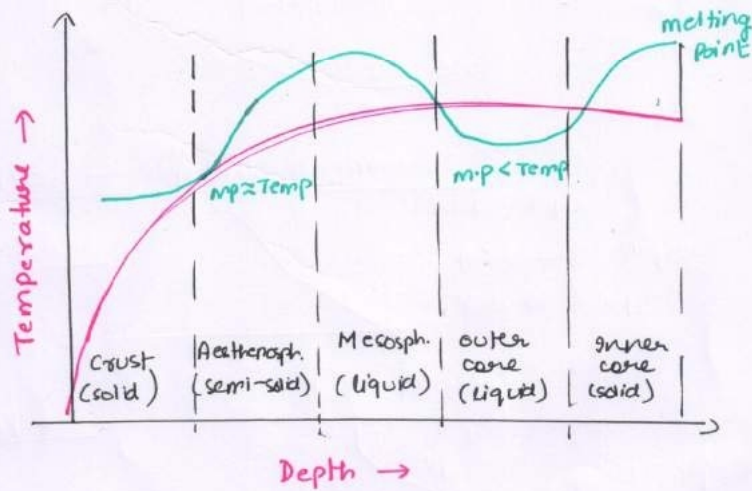
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Que. 3 (b) Write note on geothermal gradient in earth's interiors.

Ans. Earth's interior can be divided into various layers depending upon variations in temperature, pressure, density and type of material as shown below -



Geothermal gradients in the above layers -



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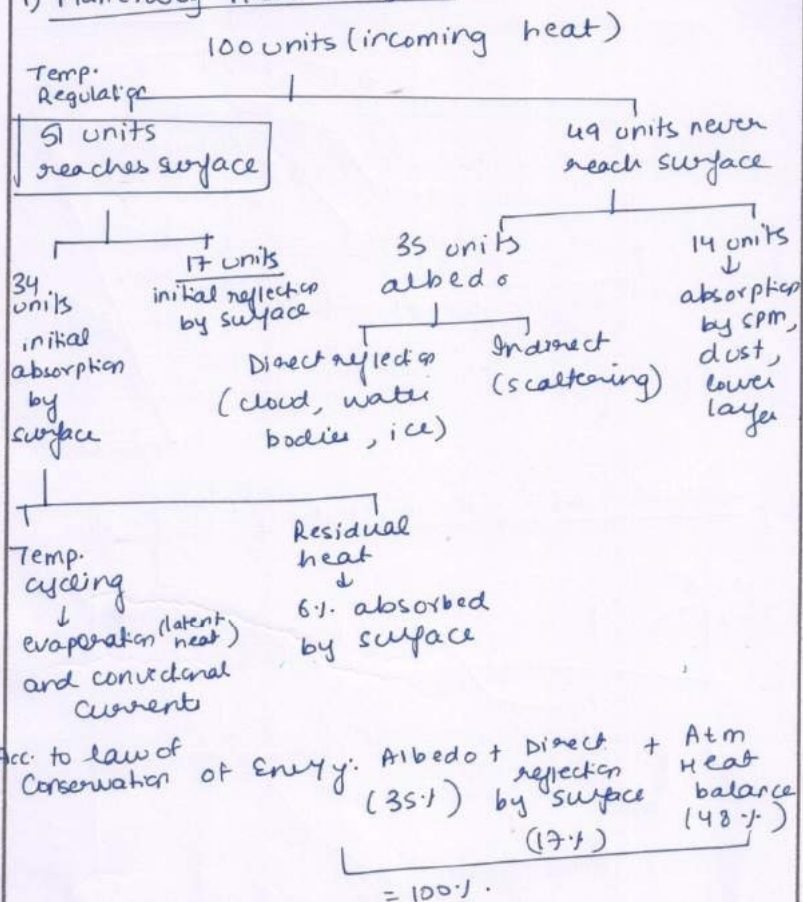
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Que. 3 (c) Discuss the profile of planetary and latitudinal heat budget.

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Ans. Heat Budget refers to the balance between incoming and outgoing solar radiations on the surface of Earth.

1) Planetary Heat Budget -

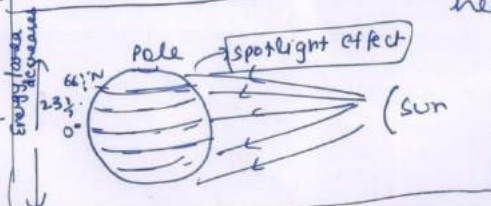


Acc. to law of Conservation of Energy: Albedo + Direct reflection + Atm Heat balance

$$(35\%) + (17\%) + (48\%) = 100\%$$

(Heat Balance Anomaly = 6% residual heat)

2) Latitudinal Heat Budget



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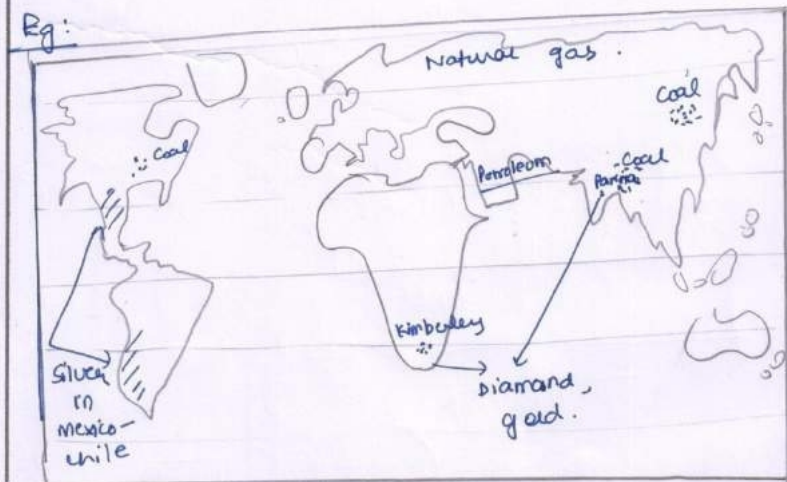
Que. 3 (d) Economic geology

Ans: Geology is the scientific study of subsurface rocks, minerals and fossil fuels

Economic importance of geological structures

- ① Building stone - sandstone, granite gneiss, red laterites for road construction
- ② Precious minerals - gold, diamond, silver etc
- ③ Minerals for industries - Iron ore, Bauxite, mica, limestone.
- ④ Fossil fuels - coal, petroleum, natural gas
- ⑤ Radioactive minerals - uranium, thorium, Beryllium, Germanium
- ⑥ Rare Earth Elements (REE) - used in electronic semiconductor industry etc.

Eg:



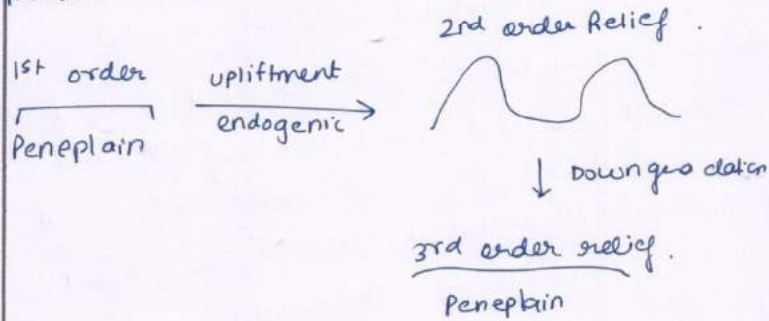
Economic Geology in world

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Que. 4 (a) Write note on relief and its order.

Ans. Relief refers to any topography on the earth's crust and its order refers to the application of forces (endogenic and/or exogenic) on the relief resulting in its present status.



Also, world morphological characteristics can be divided in order according to size -

Order	Morphological characteristics
First	: continents and ocean basins
Second	: shield and oceanic plate
Third and Fourth	: Major structural units - orogenic belt, basins, rift system
Fifth	: Anticline, syncline, hills, valleys
Sixth	: Ridges, terraces, cirques, meadows
seventh	: aulnes, patterned ground
eighth	: knick point, rattle and pool.

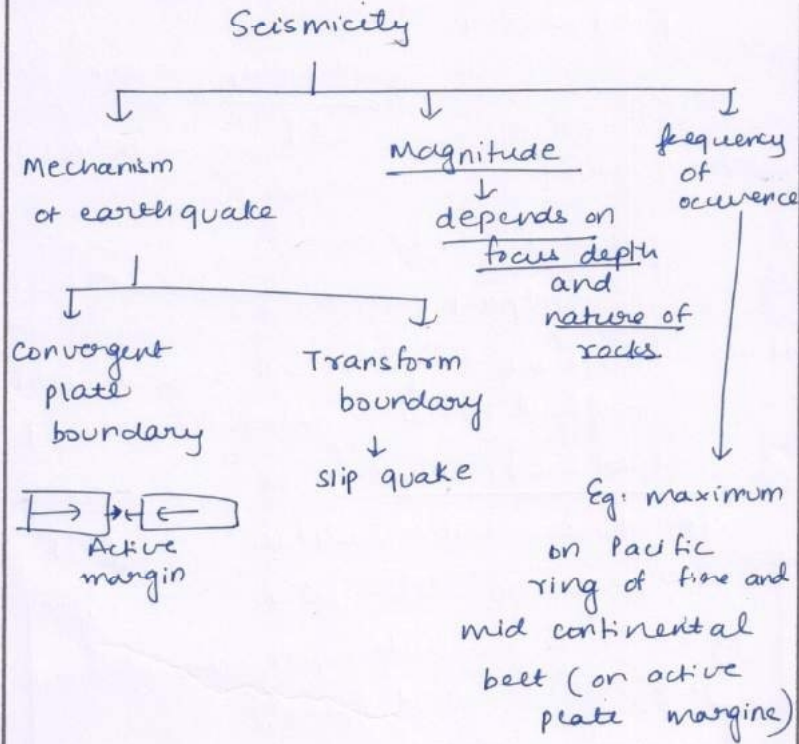
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Que. 4(b) What is meant by seismicity?

Ans. Seismicity is defined as the measure of frequency of occurrence, magnitude and mechanism of earthquake in an area.

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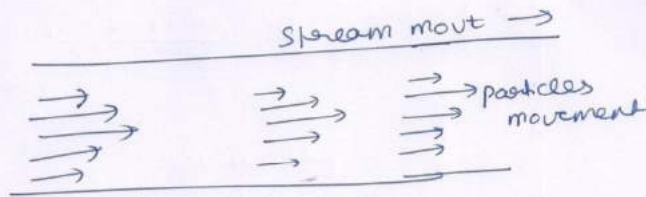


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Que. 4(c) Discuss the elementary difference between laminar and turbulent stream flow.

Ans.

Laminar stream flow



- It is common in groundwater and glacier, but not in rivers, although it can occur in the bed in lower course of the river.

- It refers to the horizontal movement of water where water moves at uniform velocity with one layer of water molecules sliding over the next without mixing.

- It cannot support solid particles in suspension.

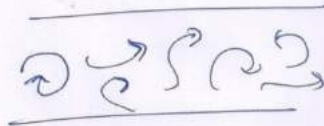
Conditions -

1. shallow channel
2. smooth straight channel
3. low velocities.

Turbulent Flow

- It provides upward motion in the flow,

that allows lifting and support of fine particles which will contribute to depositional landform down the river.



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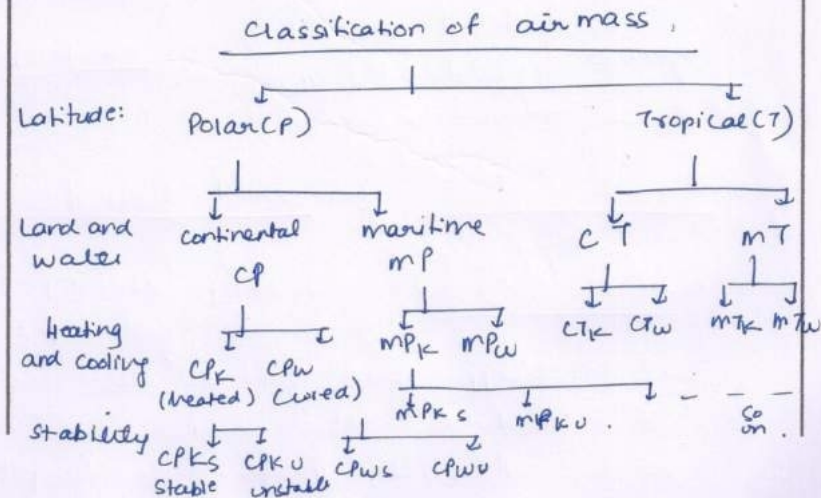
- series of erratic eddies (horizontal and vertical)

Conditions

- ① Complex channel shape - meandering channels, alternating pools and riffles.
- ② high velocities.
- ③ cavitation in which pockets of air explode under high pressure.

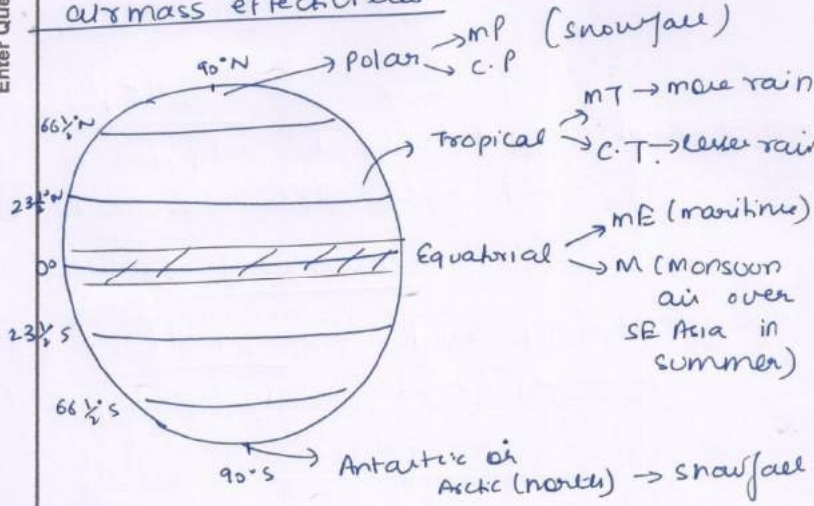
Que. 5 (a) Elaborate on global precipitation pattern in context of airmass effectivities.

Ans: Air-mass refers to mass of air having uniform temperature, pressure and relative humidity horizontally.



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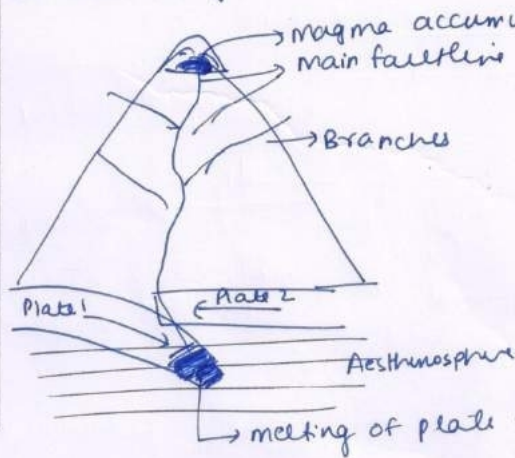
Global Precipitational Pattern according to air mass effectivities -



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Que. 5 (b) Explain the concept of vulcanicity and discuss vulcanic landforms.

Ans. vulcanicity is the process in which magma comes from the asthenosphere on the surface and erupts (volcanoe).

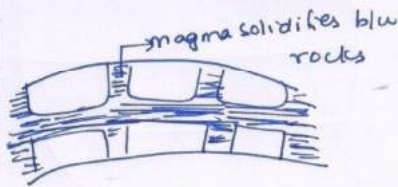
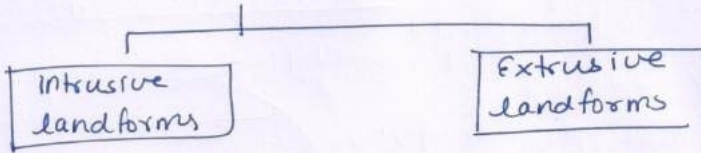


- ① Fissure formation
- ↓
- Head accumulation
- ↓
- Eruption
- ↓
- Volcanic cone formation
- ↓
- Narrowing of crater
- Crater lake → Calderna formation

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Volcanic landforms

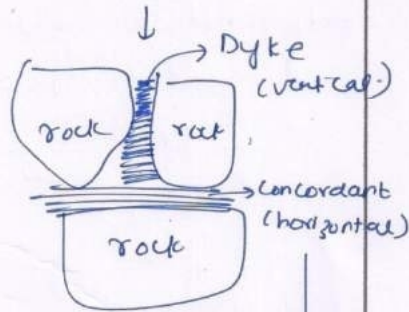
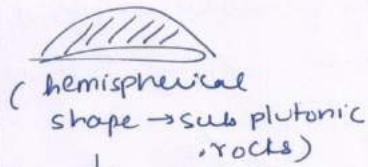


Temp. of magma > melting point of rocks

Temp. of magma < melting point of surrounding rocks

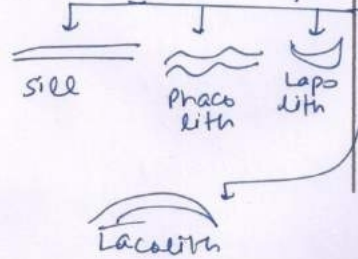
rocks melt and re-solidify to form Batholiths

magma fills up interrock spaces



When exposed to surface due to erosion

Stock mountains
Eg: Dartmoor Ridge (UK)



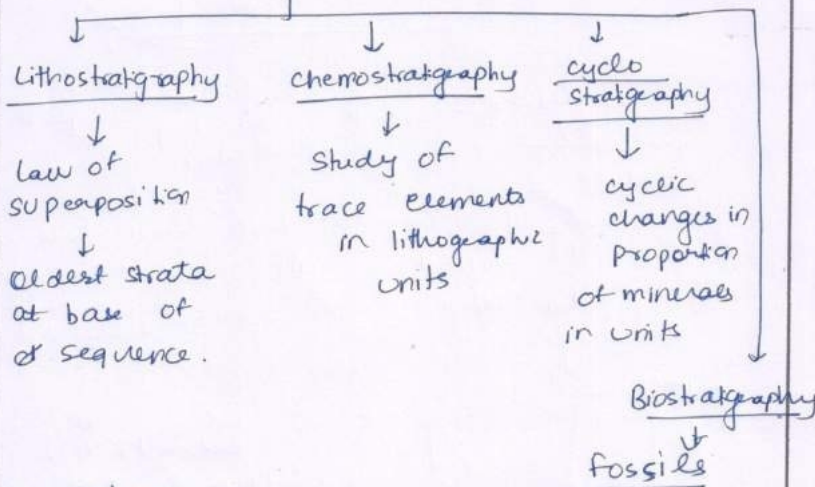
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Que. 5 (c) Elaborate on concept of stratigraphy. Also highlight its limitations.

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Ans. Stratigraphy is a branch of geology which studies rock layers (strata) and layering (stratification). It is primarily used in studying sedimentary and layered volcanic rocks.

Types



Limitations

- ① Difficult to know on which layer one is working and the date the level was formed in absolute terms.
- ② Some layers form very slow.
- ③ Some layers could be destroyed due to calamities, etc. ice ages etc.

Enter Question No

Que. 6(a) Examine Runcorn's contribution in revival of continent drift theory.

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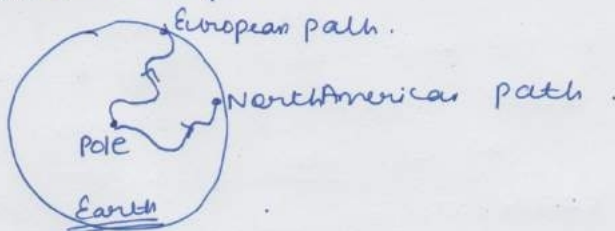
Ans. Stanley Runcorn ~~has~~ played a major role in revival of Wegner's continental drift theory by putting forward studies in Paleomagnetism and Geo-magnetism.

- ① He helped usher the concept of a dynamic and elastic earth, rather than a static Earth.
- ② He applied intensive statistical analysis of ancient record of Earth's magnetic poles trapped in sedimentary and igneous rock. He studied rocks from US and Europe, and found that magnetic orientation contained in the rocks pointed to large scale movement of Earth's magnetic Poles.
- ③ He mapped polar migration of rocks of from different geological periods and found that migration rates were different for rocks of US and Europe which suggested to him, that over time Earth's

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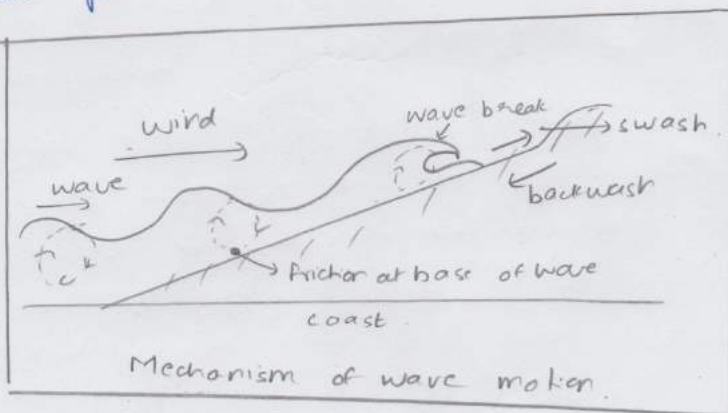
poles have undergone great movement
 ⇒ Polar wandering.

③ He further found out that migration made sense only if land masses itself moved ⇒ This gave a scientific proof for Wegner's theory of continental drift.



Que. 6(b) In light of coastal erosion, examine the major controller of erosion.

The coastline is under constant action of waves, tides and currents causing marine erosion and deposition, leading to formation of marine landforms.

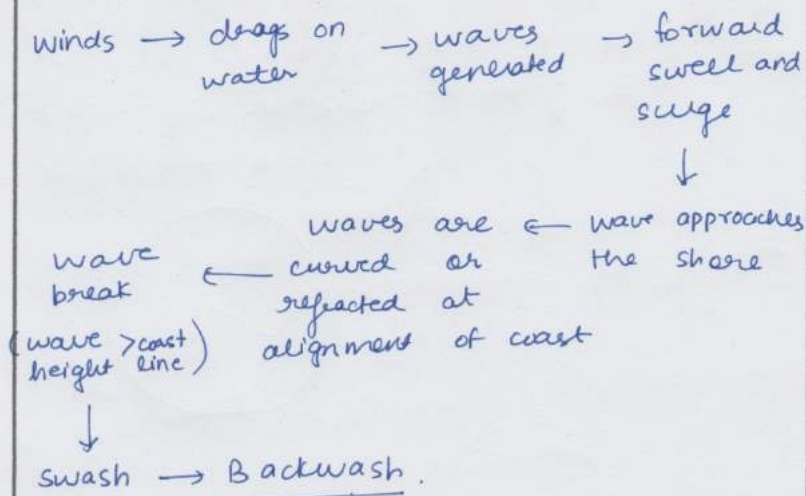


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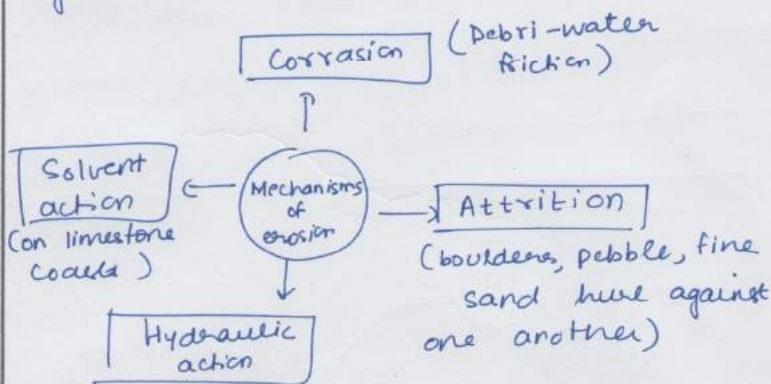
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Major controller of coastal erosion can be examined by wave action analysis:-



(Also there is undertow near bottom, away from the shore).



The rate of marine erosion depends upon nature of rock, amount of rock exposed to sea, effects of tide, current and human interference in coast protection.

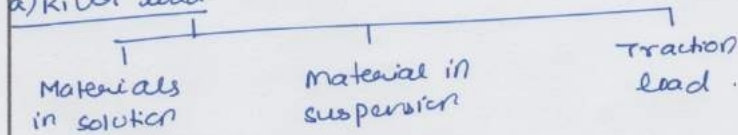
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Que. 6 (c) Avail the details of alluvial river actions.

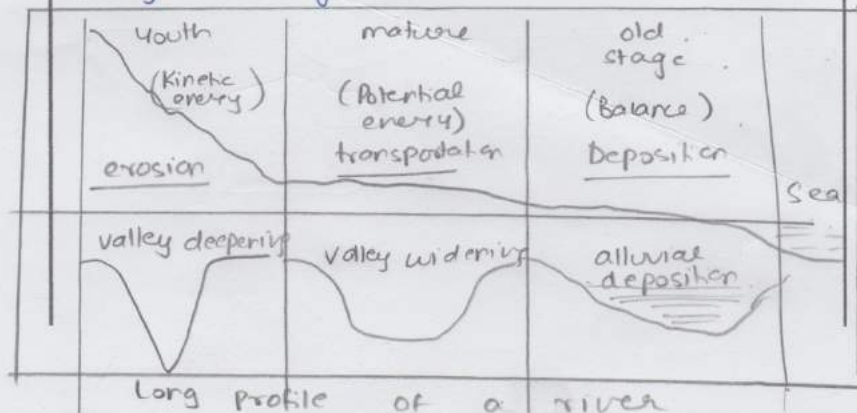
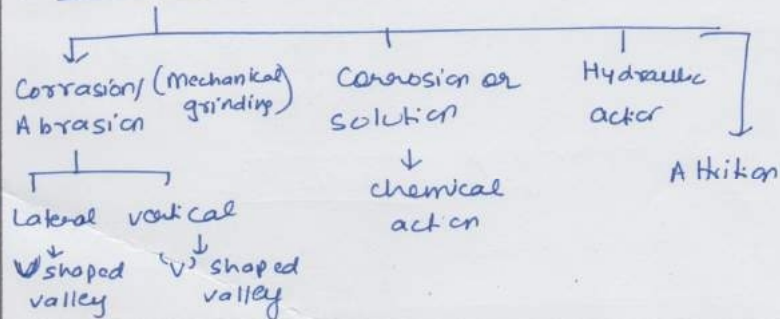
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Ans. The river action is a combination of erosion, transportation and deposition going on at different scales simultaneously depending of stage of river (youth, mature or old). It is an interplay of kinetic and potential energy (law of conservation of energy).

a) River load



b) Processes

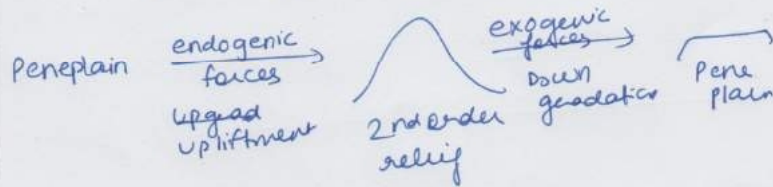


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Que. 7 (a) Examine the structural controls in landform development.

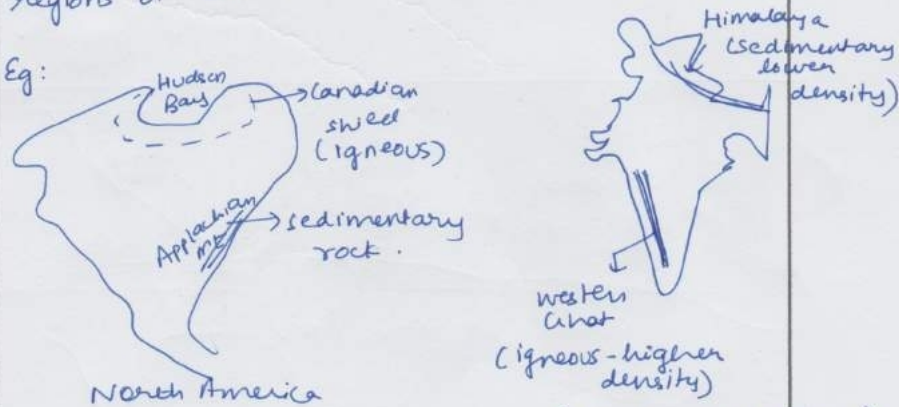
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Ans. Landform development is based on the principle of uniformization which refers to a cyclical geomorphological cycle -



Davis had postulated that structure of rocks has a bearing on landform development. This is based on law of Inertia (Newton's 1st law), \Rightarrow If similar forces are applied on different densities, relative upliftment will be higher in regions of lower density.

Eg:



\therefore (Ht of Canadian shield < Ht of Appalachian.)

(Himalayas > western Ghats)

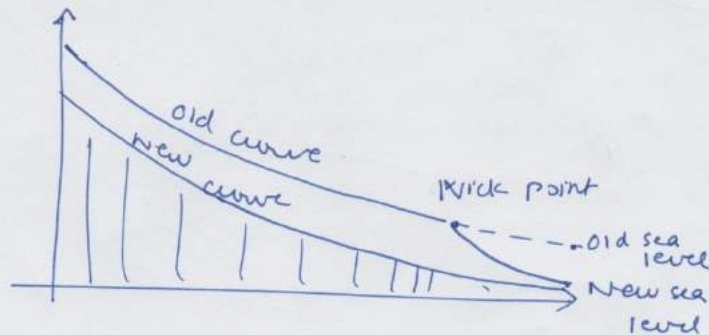
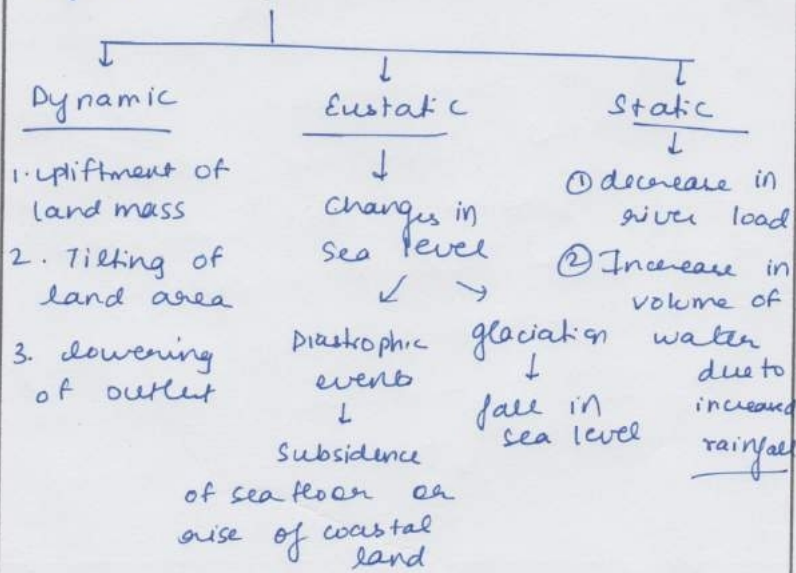
Enter Question No.

Que. 7 (b) Avail a brief description of rejuvenation.

Candidate should not write anything in the margin

Ans. Rejuvenation means acceleration of erosive power of fluvial process (rivers) caused by a variety of factors. It lengthens the period of cycle of erosion.

Types of Rejuvenation -



Enter Question No

Que. 7 (c) Explain mass movement and identify its types.

Candidate should not
write anything in the margin

Ans: Mass movement is the detachment and downslope transport of soil and rock material under influence of gravity, accelerated by presence of water, ice and air.

Classification of mass movement

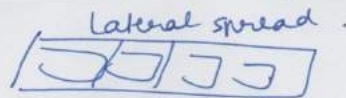
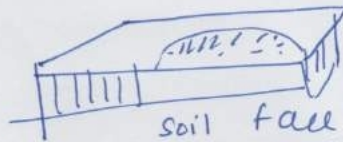
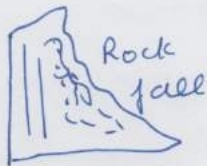
- (A) 1) Very Rapid movement - Landslides
(no water required)
- slump
 - debris slide
 - debris fall
 - rock fall
 - rock slide
- 2) Slow movement (little water required)
- Rock creep
 - soil creep
 - Solifluction
- 3) Rapid movement (flowage) - enough water required
- Earthflow
 - mud flow
 - sheet wash

- (B)
1. Fall - Rockfall, Debrisfall, Earthfall
 2. Slides - a) slump - rock, debris, earth
b) slide - rock, debris, earth.
 3. Topples - rock, debris, earth topple

Enter Question No

Candidate should not
write anything in the margin

4. Flow - Rock flow, soil flow
5. Lateral spread .



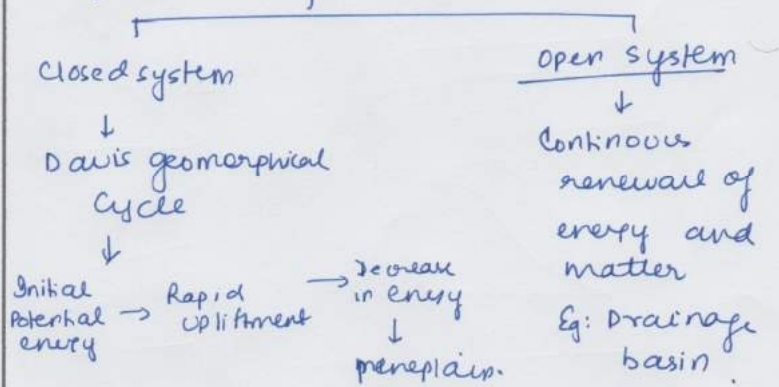
Que. 8 (a) Discuss characteristics of earth as a geological system.

Ans. A system is defined as a set of objects that are considered together by studying their relationships to each other and their individual attributes. A geological system is an integrated complex of mosaic of geomorphic features and this system functions under definite conditions through input of energy (insolation, upliftment etc) and output of matter.

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Earth can be considered as a geological system -



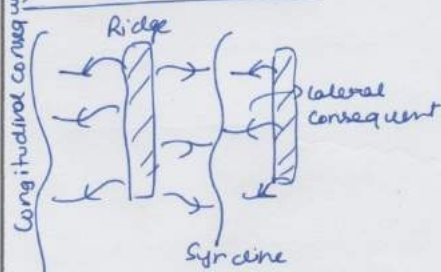
* Also there is feedback mechanism in Earth (both positive and negative)

Que. 8 (b) Examine different types of drainage pattern with suitable examples.

Ans.

Drainage pattern refers to the 'form' of the drainage system and spatial arrangement of streams in a particular locality or region

1) Trellised pattern



2) Dendritic pattern



Eg: Mahanadi, Ganga, Godavari, etc. in India.

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write anything in the margin3) Rectangular pattern4) Radial PatternEg: Amarkantak
(Son, Narmada,
Maharadi)
in India5) centripetalEg: Katmandu valley
in Nepal6) AnnularEg: Sonapat
dome in
Bihar

Que. 8 (c) Comment on types of erosional surfaces on the basis of the development, mechanism involved.

Ans.

The almost plain to pogeographic surface having undulating ground surface and remnant low reliefs caused by dynamic wheels of denudational processes and cutting across geological formations and structures are called erosion surfaces

Types of erosion surface

- ① Peneplain - formed in last stage of cycle of erosion, due to exogenic forces (humid climate)

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write anything in the margin

② End rumpf - last stage in Penck's cycle of erosion, formed in humid climate. Also called ~~inselberg~~ Inselberg.

③ Pan plain or Pan lane (Crickmay) - formed by joining together or spreading flood plains by lateral erosion - humid or subhumid.

④ Etch plain - formed in Savannah region, erosional platform formed by seasonal rivers

⑤ Pedi plain (LC King) - in semi arid region, by merging of several pediments

⑥ Pan fan (AC Lawson) - formed in Arid regions, endstage, ridged reduced basins filled.