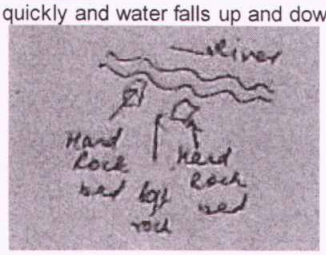
GS Mains Paper I & II
Mock Test 3

Q1.a

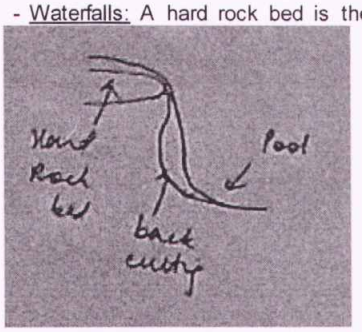
Youth Phase

In this phase, the erosional activities dominate. Following features can be seen:

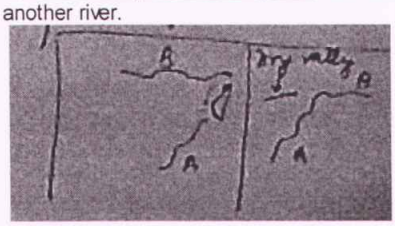
- Rapids: In here, the river bed alternates between hard and soft rocks. The soft rocks get eroded quickly and water falls up and down.



- Waterfalls: A hard rock bed is there followed by soft rocks. The river cuts the soft rock.



- Deep, narrow, V-shaped valleys: The river fails to broaden and cuts its own bed. (Vertical erosion is more than lateral erosion)
- Deep gorges: eg. Indus, Brahmaputra gorges.
- Head cutting and river capture: The river cuts along its own bed and may capture a tributary of another river.



Maturity

Here the erosional activity slows down and depositional activity picks up. Following features can be seen: (transportation is main activity at mature stage)

- Meanders: The water speed is slow. So the river may flow around an obstacle.

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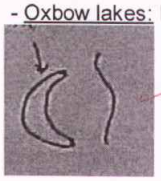
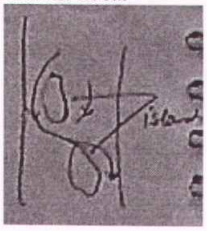
Priyanka Madam

- Oxbow lakes: Meanders develop into oxbow lakes.

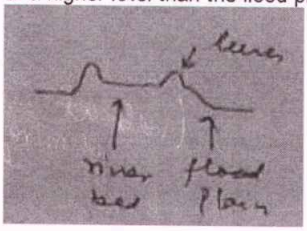


explain ox-bow lake

- Braided streams: Due to the depositional activity, the alluvial islands may be formed in the river channel itself.



- Leeves: These are the deposits of old alluvial along the river banks. They are the result of depositional activity in the old floods.
- Lowed flood plain and higher river bed: Due to deposition along the bed, the river bed may come at a higher level than the flood plain.



flood

Old Age

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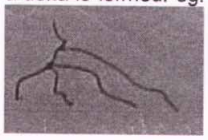
The erosional activity is almost finished and the gradient leveled. Only the depositional activity dominates. Following features can be seen:

- Deltas: Due to the low speed, river is unable to carry load. So it gets split into distributaries and a delta is formed. eg. Sunderban delta.



- Estuaries: Due to unfavorable conditions like strong opposite winds, high tides, prior sedimentation of alluvial load, deltas may not be formed. In such cases, estuaries are formed. eg. Narmada.

Q1.c

Oceans and atmosphere help in heat transfer across the world via convection movements and ocean / air currents.

To highlight their role, we will pick monsoon climate type:

- In coastal areas, temperature ranges are considerably lower than in inland areas (even at the same latitude). This is due to the moderating effect of oceans and their moisture carried in the air.

- The sea breeze and the land breeze affect the daily temperature in coastal areas. In day, land gets heated up, air rises and is replaced by the sea breeze which is cooler. Vice versa in night.

- The seasonal reversal of wind pattern (monsoon) causes precipitation due to involvement of ocean. As the SE trades cross equator towards the ITCZ (shifted north in summers), they blow over the ocean, pick up moisture and cause rainfall. This cools otherwise very hot land mass.

- The wind pattern is reversed in winters. ITCZ shifts back south, NE trades take over. Because they are cold and dry, they don't cause rain anywhere except eastern part of S India and Sri Lanka. This is because as they pass over the Bay of Bengal, they pick up moisture.

- Anomalies in ocean surface temperature over Pacific and Indian oceans lead to Al Nino effect. This disturbs the pattern of air movement and leads to drought like conditions. Its opposite is La Nina which leads to good precipitation.

- Cyclones are caused by air – sea interaction. In the absence of vertical air currents, large coriollis force and presence of large amount of moisture (from the oceans), cyclones are formed.

- The jet streams also play an important role in determining the strength of the monsoon.

- Cold ocean currents will lead to cooler and drier conditions along the coast. Warm ocean currents lead to opposite.

Q 2.a

Clearly lobbying is a legitimate, integral part of democratic functioning. However, keeping in mind the practical conditions in our country, as well as international experience, it needs to be strictly regulated.

Arguments in favor of lobbying

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- A democracy means ruling as per the wishes of the governed. Lobbying, simply is a channel, through which those concerned with a policy (or the lack of it) can make the policymakers aware of their wishes.

- Art 19 of our Constitution guarantees us the right to freedom of expression and to form associations. Lobbying falls well within the ambit of these guarantees.

- In the modern market oriented governance, government needs to know the views of the private sector to make policies. Gone are the days of rigid centralized planning.

- It is only a pre-legislative deliberative process. Policies and arguments can be discussed rationally and frankly away from the public glare.

Risks involved in lobbying

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- In Indian conditions, where black money is rampant, lobbying can easily degenerate into bribing.

- Here the powerful business houses can use the vast funds at their disposal to sway the policies in their favor. The public interest may take a back seat.

- Citizen groups are not as active here as in the west. Even when citizens show initiative over an issue (say Dec. 16 rape), they are beaten. This creates an asymmetry in the power structure.

- Lobbying is not transparent.

International Experience

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USA has legalized lobbying, but has imposed strict transparency and disclosure norms on it. Each lobbyist has to be registered. Each dollar spent has to be reported. There are activities in which money can't be spent to influence the policymakers.

Lessons for India

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Given the governance utility and the constitutional guarantees, lobbying may be allowed. But special safeguards, as in USA, need to be imposed. Additionally, ordinary citizen groups need to be encouraged. The voluntary sector policy and regulations must be amended for that.

Q2.c

It rained over 600 mm in Uttarakhand during the 48 hours prior to the tragedy. A lake was formed above the Kedarnath valley which burst. The narrow valleys generated tsunami like waves. Tragedy of such proportions last happened there in 1882.

Clearly its easy to blame the nature for such disasters, but the question is – is it solely to be blamed? Doesn't man share any part of the blame? Let us examine this question in the light of the Uttarakhand tragedy only.

Role of man made factors

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- Global warming: This has increased the chances of extreme weather events like this one. It also leads to larger snow melt causing floods.

- Deforestation of Himalayas: Forest cover binds the soil thus preventing land slides and erosion. It also absorbs water flow thus reducing the run off.

- Construction of dams: It can be argued that the Tehri dam saved Haridwar. But equally true is the fact that the blasting of Himalayas to create tunnels for the purpose of hydel projects weakens them. Considering the fragility of Himalayan topography (as they are still rising), this increases the chances of landslides.

- Population and tourism pressure: Himalayas have a carrying capacity. But the increasing population and tourism puts pressure on its resources including land.

- Unplanned development: If there are houses, guesthouses and roads built on the river courses, the loss in the tragedy is liable to mount. This is a result of poor planning and / or poor implementation of the plans.

- Lack of forecasting and communication systems: IMD weather forecasts were too vague and 'inactionable' even if the administration wanted to act. The communication systems were so poor that until the armed forces were called in after 12 days, the state govt. had little idea of the magnitude of the disaster.

General CAG observations on disaster preparedness

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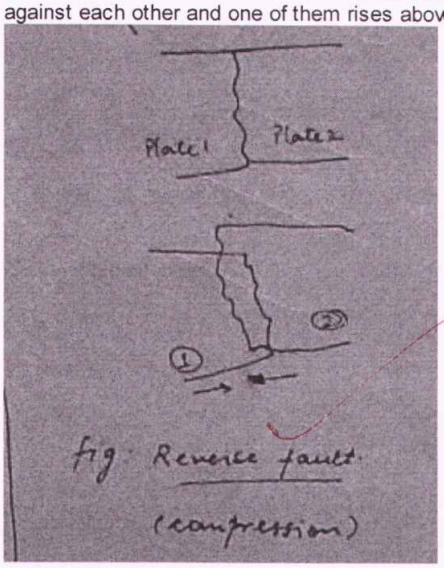
- NEC has not met since 2008.
- National Disaster Plan has not been formulated!
- NDMA has no conduct of business rules.
- NDMA has no monitoring mechanism to see its guidelines are complied with by the states and the ministries.
- The NDRF is understaffed, ill equipped and ill trained. States, including Uttarakhand, have not created SDRFs.

Q 3.a

Tsunamis occur when in the ocean bed, a reverse fault occurs i.e. 2 adjacent plates compress against each other and one of them rises above the other.



Thus the ocean bed rises suddenly and a column of water is displaced above. In the vast open ocean, huge tsunami waves can't be seen. But as they approach a coast, due to the friction from the sea bed, the water above it begins to climb. This leads to the formation of a huge wave. The narrow the coast, the higher the wave.

Prevention and mitigation

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Tsunamis can't be prevented but their effect can be reduced.

- Early warning systems: These exist and they use buoy sensors and satellite communication. But the technology needs to be supplemented with human and administrative capacity building.

- Mangroves and other natural bulwarks: They break the bulk of the waves.

- High elevation shelters: These should be localized and spread throughout.

- Strong construction: Should be strong such that the entire building is not blown away by the waves.

- Community participation and local knowledge: These should be the integral part of the mitigation approach.

Q 3.b

- Equatorial regions: These latitudes receive high daily rainfall and have high temperatures. So evergreen dense forests with thick canopy cover and tall trees are found. But Mt. Kilimanjaro located in this belt has cold climate due to its altitude.

- Tropical grasslands: High temperature and a distinct hot, dry season leaves trees unsuited here. So tall grasses are found here. eg. Savannah in Africa, Campos in Brazil.

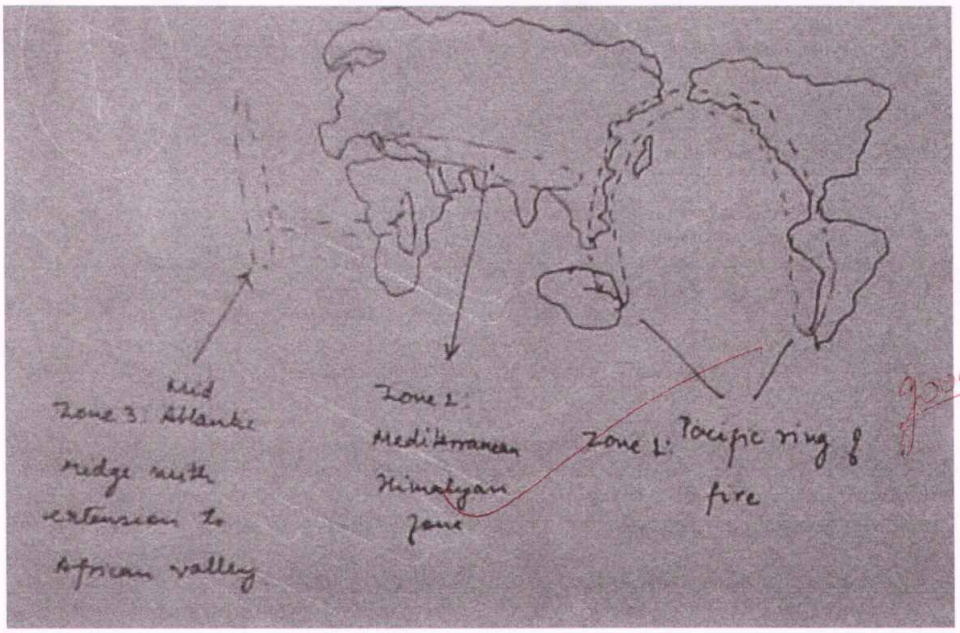
- Tropical deserts: As we move further out from equator, around the tropics, its still hot. But due to various factors (dry NE / SE trades blowing from land, rain shadow area), precipitation is low. So deserts are found and vegetation is thorns, scrubs. eg. Sahara, Thar, Australia. But at places of higher altitude like in sub-Himalayas, temperature is cooler and temperate type vegetation is found. Further higher, coniferous and polar type vegetation may be found.

- Temperate grasslands: Located further away from equator, it is cooler here. Precipitation is low but more effective. These have warm summers and cold winters. Short grasses grow. eg. Steppes in Russia and Ukraine, Prairies in USA, Pampas in Argentina.

- Tundra type: Still north, it is very cold. Winters are harsh, summers are cool. Coniferous forests are found which have needle like leaves which are shed in winters. Fir, oak are main trees.

- Polar type: Around the poles, permanent ice caps are there. So hardly any vegetation is there.

Q 3.c



Earthquakes and volcanoes are both related to the plate tectonics. They occur mostly in the weaker part of earth's crust where one plate is pushing into the other. This builds a stress over time which is released in the form of a volcano or an earthquake.

Most of them occur in 3 zones.

6.5

Zone 1. The Pacific ring of fire

This is the most unstable region and majority of the earthquakes and volcanoes occur here regularly. The plates involved are:

- Pacific plate
- Eurasian plate
- North American plate
- South American plate
- Nazca plate
- Cocos plate
- Indo-Australian plate

Also explain subduction zone mechanism to explain phenomenon of earthquake & volcanoes

The Pacific plate pushes into the others leading to stress buildup on the edges. Similarly the Nazca plate pushes into the South American plate.

Zone 2. Mediterranean – Himalayan zone

This is the second most active zone and this is because the Indo-Australian and the African plates push into the Eurasian plate. This is the reason why Himalyas and Alps were formed.

Zone 3. Mid Atlantic ridge

This runs from North to South Atlantic and occurs as the two adjacent plates push against each other. Its extension is to the African Rift Valley.

6.5

Q 4.a

The DPCO, 2013 controls the price of 348 essential medicines including the commonly sued ones for heart diseases, diabetes. But the devil always lies in the implementation and here the following loopholes may be exploited.

Also mention how more than 80% of drugs are out of its purview

- It doesn't cover patented drugs. Cancer, HIV drugs are patented.

- It uses brands with market share > 1% only to calculate the ceiling price. It is the small manufacturers who sell drugs cheaply but they may not have a market share > 1%. So in effect, the ceiling price will be computed using only big brands who sell expensive.

- The manufacturer can always evade this by stopping the production of the standard drug and manufacture the non standard version. eg. 3 mg instead of standard 2.5 mg. But there is a safeguard to prevent this. The manufacturer has to give 6 months prior notice to the government before stopping production. The govt. may require it to produce / import for 1 more year in public interest.

Also no review mechanism of ceiling price.

- It, in effect, locks the existing inefficiencies in the system. It does nothing to prevent doctors from prescribing expensive brands.

Q 4.b

Causes of depreciation

- US Fed's chairman Ben Bernanke's statement that Fed may start rolling back the quantitative easing. This would stop the flow of easy money and funds will flow out of India.

- Continuing economic slowdown (GDP growth of 5% only). Major infrastructure projects worth

over Rs. 750,000 crores are stalled.

- Losing competitiveness of Indian economy. manufacturing and services both sectors showing weakness.

- Negative export growth due to weak global demand.

- High gold and oil imports leading to wider CAD.

- Slowing FDI.

- Lack of market friendly policies like in the case of Vodafone, Jet-Etihaad deal.

- Income tax crackdown on transfer pricing practices of the service sector MNCs.

Effects of depreciation

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- Higher inflation as imports (oil specially) becomes dearer and even domestic goods get priced to international prices.

- Good for exports as their dollar value becomes cheaper.

- Good for inward remittances.

- Bad for companies which have raised external loans and left the currency risk unhedged.

- Bad for economy as a whole since it comes as a shock.

- Worsens the confidence in the Indian economy leading to capital flight and higher borrowing costs.

Government actions

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- Restrictions on gold imports. Govt. has hiked duty, RBI has asked banks to import gold only to meet genuine export demand.

- RBI recently,
    - Raised MSF rate by 200 bps to 10.25%.
    - Restricted LAF window liquidity to 1% of NDTL or ~ Rs. 75,000 crores.
    - Announced sale of T-Bills worth Rs. 12,000 crores.

All this was aimed at restricting rupee liquidity, raising borrowing costs and reducing speculation so as to make RBI intervention more effective.

- Govt. announced hike in FDI limits in many sectors like telecom, insurance.

- RBI has used forex reserves.

- Govt. has given many incentives to the exporters under the FTP.

- Hike in gas prices to reduce natural gas imports.

-Ease of norms in multi brand retail.

Q 5.a

Major cyclone formation conditions

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- High moisture content in the air. As this moisture will condense, it will release vast amount of latent heat of condensation needed for the cyclone formation.

- Absence of vertical air currents to prevent the heat and air from traveling up.

- Warm air to pick up moisture and create a zone of low pressure convergence.

- Large coriollis force to generate circular movement of air and prevent the surrounding air from filling the central low pressure area.

Also mention conditions of pre-existing disturbed weather.

5

Major affected areas

- East and South China Sea. Here Taiwan, Philippines, Hong Kong, China coast are most affected.

- Bay of Bengal and Arabian Sea. Here India, Bangladesh, Myanmar and Sri Lanka are most affected. Bay of Bengal cyclones affect India more.

- Gulf of Mexico. Here Florida in US and the Caribbean nations are most affected.

Q 5.b

- Temperate grasslands have lower precipitation. But the lower temperature makes this more effective.

- Temperate grasslands have shorter grass.

- Temperate grasslands have more nutrients. grasses

- Tropical grasslands literally dry up in the hot dry season and are prone to fires.

- Temperate grasslands have been harnessed effectively for grain (wheat) production.

- Temperate grasslands occur in higher latitudes (Prairies in USA, Steppes in Eurasia, Downs in Australia, Velds in S Africa, Pampas in Argentina). Tropical grasslands occur in regions surrounding the equatorial forests (Savannah in Africa, Campos in Brazil, Llanos in Orinoco basin).

- Dairy farming / commercial animal rearing is an important activity in the temperate grasslands but not in tropical grasslands.

- Tropical grasslands support larger variety of wildlife.

good 6

Q 5.c

- Equatorial forests are thick and have heavy wild life. So they can't support large human habitations. Hence tribes and small villages only are found there. eg. Africa, Myanmar. (Dispersed settlement)

- River valleys and fertile plains in warm areas can support vast populations. eg. India. Hence they are most densely populated areas. (Question is on settlement pattern so use phrase compact settlement)

- Deserts lack resources and are too hot. So only nomadic tribes, sparsely populated are found here. eg. Sahara. But technological progress has also led to the growth of sprawling cities like Dubai.

- Temperate grasslands support extensive agricultural activities. Hence population is higher.

3.5

(Question is on settlement pattern refer approach paper)

- Hilly regions don't offer enough resources and space. So tribes and small villages only are found here.

- Tundra and polar regions are harsh and support very little population.

Q 5.d

Such deserts are:

- Patagonia desert in S America
- Kalahari in Africa
- Great Basin desert in USA
- Great Australian desert

The reasons are:

- Rain shadow area and westerlies: The Patagonia desert in S America lies to the east of Andes. The moisture carrying westerlies cause orographic rainfall on the west side of Andes only. So nothing is left for here. Similarly the American desert lies to the east of Rockies. The westerlies are dry by the time they reach here. The Kalahari has the South African Highlands to its west.

- Cold ocean currents:
  - Patagonia desert: Cold Peruvian current
  - American desert: Cold California current
  - Kalahari desert: Cold Benguela current
  - Australian desert: Cold West Australian current

When winds pass over the cold current, they absorb less water. And when they blow over the hotter landmass, the relative humidity falls further and little precipitation occurs.

Q 5.f

- Tropical forests have hard wood trees like mahogany. Cutting them is difficult. Temperate forests have soft wood trees like pine. Cutting them is easy.

- Tropical forests have dense vegetation. A large variety of trees are intermixed. So commercial lumbering is unviable as it requires one set of trees. Temperate forests are less dense and have vast tracts of one set of trees.

- Temperate forests are located in the developed countries which have the resources to build infrastructure for lumbering. Tropical forests are located in the less developed / developing countries which lack resources.

- Infrastructure development and maintenance is difficult in the dense tropical forests. If a road is built, the forest will soon encroach again on it. This issue is less in temperate forests.

Q 5.g

Modern cotton textiles industry first came up in Manchester in UK. This was due to the industrial revolution there and fall in cost of ocean transportation. Then as the industrial revolution spread in

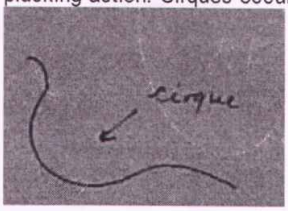
other parts of Europe, USA and Japan, the industry spread there.

In the later part of the 20th century, as the Asian countries began to industrialize, the industry spread to China, India. A big factor behind the shift was low labor cost and proximity to raw materials. Also China had excellent infrastructure and industrial policies. Subsidies also played an important role.

However, the latest trend is that the industry is shifting to even lower cost countries like Bangladesh, Vietnam, Sri Lanka. The reason is lower labor costs, standardization of technology, coastal locations. Also the appreciation of Chinese Yuan and phasing out of subsidies by India under WTO obligations (case filed by Turkey) is reducing the competitiveness of these two countries.

Q 6.a

A cirque is formed due to glacial erosion. It is an arm chair like depression formed as the glacier flows down the slope and the slope becomes gentle. The back side is cut further inside due to plucking action. Cirques occurring on 3 sides give the shape of a pyramidical peak.



Q 6.d

As the sea temperatures rise and the water becomes more acidic, the symbiotic bacteria inside the coral which help it in synthesizing nutrition and give it its color are expelled. Thus the coral becomes colorless and dies. This is coral bleaching.

Q 6.e

These are formed due to accumulation of the wind blown sand and silt. They occur in desert areas and often form small hills or bluffs.

Q 6.f

La Nina is the strengthening of the normal Walker cell condition where following conditions are satisfied:
- low temperature over East Pacific ocean near the Peru coast, and
- high temperature over the East Australian coast.

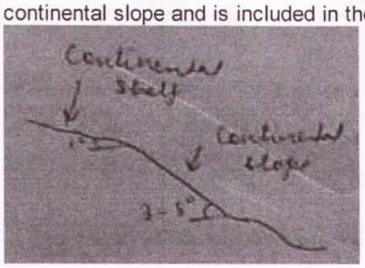
This strengthens the monsoon winds and leads to heavier precipitation over India.

Q 7.a

The amount of biological units and their activities an ecosystem can sustain given its resources.

Q7.b

After the continental shelf, the slope becomes steeper suddenly (3 – 5 degrees). This is continental slope and is included in the continental margin.



1.5

Q 7.c

These are the underwater sea hills, usually of volcanic origin and flat tops and not too high (< 1000 m).

1.5

Q 7.e

The forest is planned to provide for the needs of the society living on the fringes (like firewood, minor produce). It is managed by the involvement of the community.

1

120/250

Good. You have shown good understanding in some of your answer. Keep it up.