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Paper Code - 79542  
Code - 63692

ANSWER KEY  
D - III

- Time : 3 Hours  
Max.Marks: 100
- Q1 Fill in the blanks. 10 X  
1=10
- i) **CENTRIPETAL** drainage pattern develops in and around a lake.
  - ii) **RADIAL** drainage pattern develops if the streams are flowing on the flanks of a volcano.
  - iii) Mushroom rocks are the result of **WIND** erosion.
  - iv) Honeycomb weathering is a type of **PHYSICAL** weathering.
  - v) Ox-bow lakes are present in the **OLD** stage of the river.
  - vi) Large rock boulders deposited after the glaciation are called as **ERRATICS**.
  - vii) A tributary valley whose base slightly at higher elevation than main glaciervalley is identified as **HANGING VALLEY**.
  - viii) A table-top kind of landform having its top width more than the height of the landform is also called as **MESA**.
  - ix) An imaginary line joining points of equal elevation on a map is called as **CONTOUR**.
  - x) An elevated landform present between two adjacent valleys is identified as a **SPUR**.
- Q1B Define the following: 10 X  
1=10
- i) **Bifurcation ratio:** A bifurcation ratio is the ratio of number of streams of lower order to number of streams of higher order in a basin
  - ii) **Paternoster lakes:** depositional features of connecting small lakes formed by melted ice on the glacier valley floor.
  - iii) **Spheroidal weathering:** A type of a chemical weathering where final product of weathering a spheroidal boulder.
  - iv) **Ingrown meanders:** type of a meanders of a river which cuts down laterally within entrenched path of a river.
  - v) **Yardangs:** Aeolian erosional landform where landscape is formed as narrow wedge shaped pillars.
  - vi) **Ventifact:** Smooth faceted stones in desert as a result of win erosion and abrasion.
  - vii) **Arete:** Narrow, sharp edged landform resulting from glacial erosion
  - viii) **Phacolith:** A wedge shaped igneous intrusion present along the

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folds.

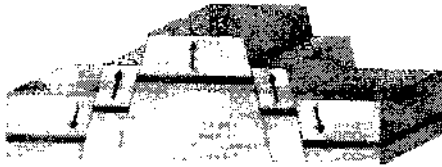
- ix) **Alluvial fan:** A sedimentary fan shaped deposit where as stream debouches onto a plane from mountains/elevation.
- x) **Ox-bow lakes:** isolated, C-shaped part of the river in old stage of a river.

Q2 Answer any Two of the following.

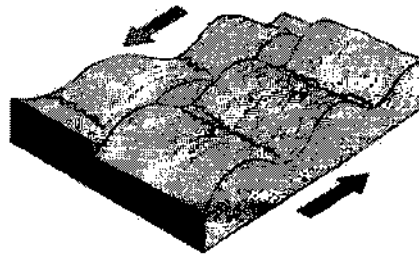
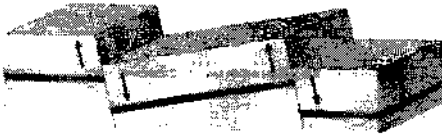
10X 2 =  
20

- a) Describe the morphology and formation of : horst and graben, shutter ridges, offset drainage pattern.

(a) Horst with step faults

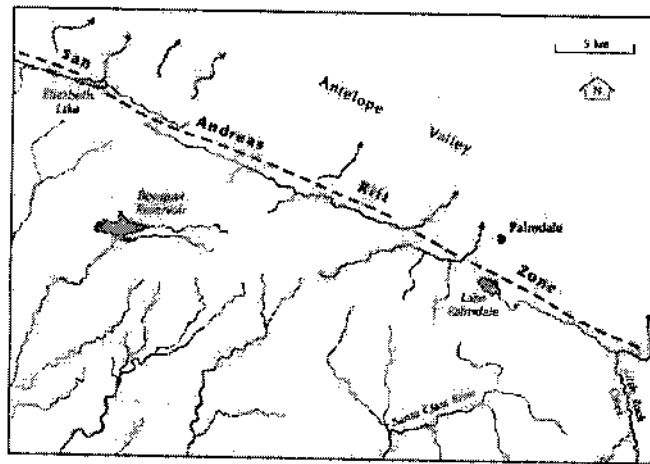


(b) Tilted block



**Figure 6.20** Shutter ridges along a strike-slip fault. Source: Adapted from Ollier (1981, 68)

Offset drainage is the chief result of strike-slip faulting. The classic example is the many streams that are offset across the line of the San Andreas Fault, California, USA



- b) What is caldera? Describe its various collapse mechanisms by which is forms.

**Calderas are depressions in volcanic areas or over volcanic centres. They are productions of vast explosions or tectonic sinking, sometimes after an eruption.**

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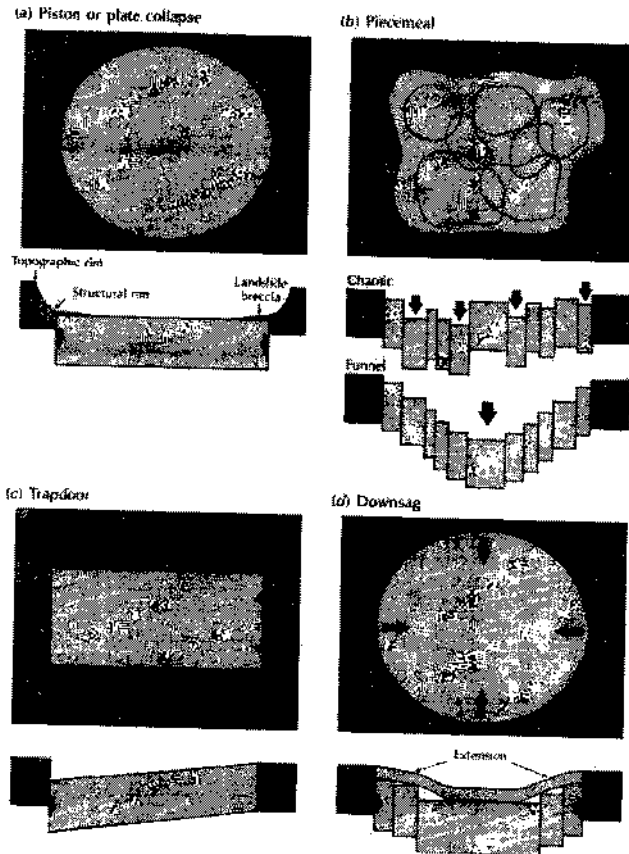


Figure 6.9 Four end-member mechanisms of caldera collapse. (a) Piston or plate collapse. (b) Piecemeal. (c) Trapdoor. (d) Downsag. Source: After Cole et al. (2005)

- c) Describe any one type of physical and chemical weathering in detail. Description of any one type from **Oxidation, Hydration, Hydrolysis, Carbonation**  
Any one from- **thermoclasty, haloclasty-honeycomb weathering etc.**
- d) Describe any five drainage patterns which are controlled by geological structure over which it flows. .  
**Dendritic, Radial, Annular, Trellis, Rectangular, Centripetal, Centrifugal, Distributory, Derranged, Parellel etc along with diagrams any five.**

Q3 Answer any Two of the following.

- a) What are the important factors that develop the shape of the dune in a desert? With the help of suitable diagram explain any three types of dunes.

**Wind directions and sand supply.**

**Any three types: barchan, Star, tranverse, parellele, parabolic etc.**

- b) What are aeolian erosional features? With the help of suitable diagrams explain any four aeolian erosional features.

**Yardangs, Zeugens/Mushroom rocks, Desert pavement, Desert pans and hollows with diagrams.**

10X 2 =  
20

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- c) What term is used for landforms that are formed due to dissolution of limestone or carbonate rocks? Describe any four types of such landforms in brief along with the suitable diagrams.

**Karst landforms**

**Includes types of dolines, polje, speleothems, uvala etc.**

- d) Describe any four glacial depositional features associated with glaciers. **Cirque, Arete, Horn, Hanging valley, Fjord -description and diagrams.**

Q4. Answer any Two of the following.

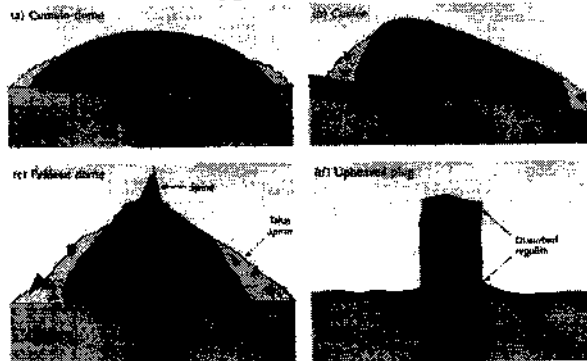
10X 2 =  
20

- a) Describe the concept of flood/storm hydrograph. Explain various factors which affect the shape of the flood/storm hydrograph.  
**Definition and description of flood hydrograph**  
**Factors: Drainage basin shape size, stream density, precipitation, slope/gradient.**
- b) Write a note on the following stream ordering schemes: Strahler, Shreve, Scheidegger.  
**Note along with diagram and description of each scheme.**
- c) Write a note on the superimposed and projected profiles.  
**Diagram and description of each profile.**
- d) Draw a cross sectional profiles of a mesa, butte and hogback. Also describe a topographic view of the same features.  
**Cross section and topographic view diagram of the features as mentioned.**

Q5. Answer any Four of the following.

4X5=20

- a) Anchored dunes  
**Anchored dunes are the dunes which are associated with some obstacle in desert like rock or coastal vegetation. Types are climbing and receding dunes.**
- b) Acidic lava cone types



**Cumulo domes, Coulee, Pelean Dome, Upheaved plug.**

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c) Duricrust and its types

**Duricrusts are important in landform development as they act like a band of resistant rock and may cap hills. They occur as hard nodules or crusts, or simply as hard layers. The chief types are ferricrete (rich in iron), calcrete (rich in calcium carbonate), silcrete (rich in silica), alcrete (rich in aluminium), gypcrete (rich in gypsum), magnecrete ferricretes. In more arid regions, it is sometimes associated with calcrete.**

d) Dolines

**Types of dolines- Solution, collapse, alluvial stream-sink with diagram and description.**

e) Antecedent rivers:

**An antecedent stream develops on a land surface before uplift by folding or faulting occurs. When uplift does occur, the stream is able to cut down fast enough to hold its existing course and carves out a gorge in a raised block of land.**

f) Linear parameters associated with drainage basin

**Various parameters including area, shape, form, basin elongation, circularity ratio.**

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