

# Geological Structures

---

**Que 1: Write notes on significance of unconformities and joints. Marks :(4)**

**Ans:** Unconformities:- dating of orogenic and epierogenic movements, useful in stratigraphy and historical geology.

Joints:- create openings in which water, oil, natural gas, etc. can be stored. joints provide surfaces along which rocks slide. Joints facilitates quarrying operations. They also important in civil engineering projects.

**Que 2: (a). A graben or rift valley, will only form in response to slip along:**

- i. normal faults
- ii. reverse faults
- iii. thrust faults
- iv. strike-slip faults

**(b) What is the difference between a horst and a graben. Marks :(3)**

**Ans:** (a). i. normal faults

(b). Horst;- upthrown blocks bounded on either side by normal faults

Graben:- downthrown blocks bounded on either side by normal faults

**Que 3: (a). Which type of fold has the limbs that dip towards each other with younger strata at the centre of the fold? Marks :(2)**

**(b) Identify the geological structure given in the diagram shown below.**

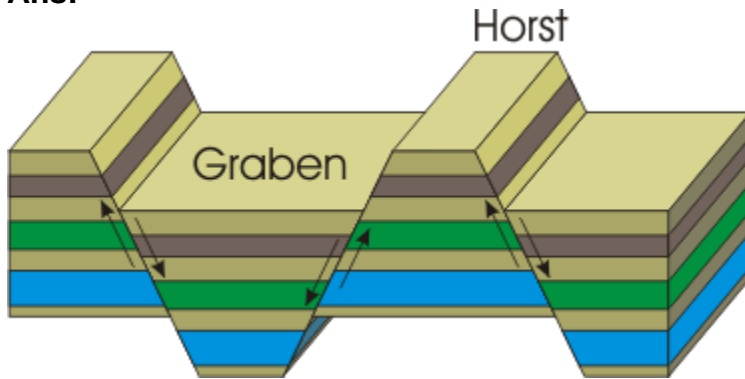


**Ans:** (a) Syncline

(b) Normal fault

**Que 4: Draw a block diagram showing a horst and a graben. Marks :(3)**

**Ans:**



**Que 5: Describe the three major types of stress. Marks :(3)**

**Ans:** Tension:- stress on rocks that are being pulled apart.

Compression:- stress that pushes rocks together.

Shear stress pushes rocks horizontally past each other in opposite direction.

**Que 6: A clinometer compass is used to measure \_\_\_\_\_ .**

a) Strike and dip direction only

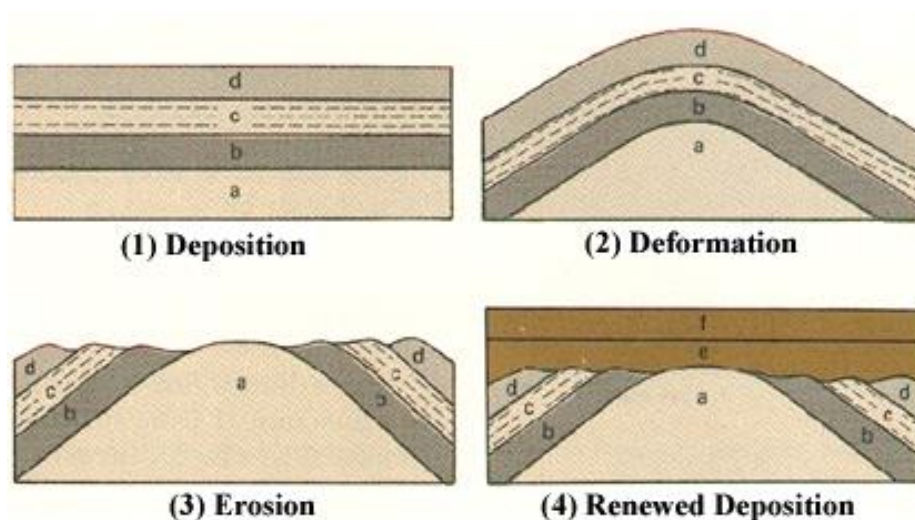
b) Strike direction only

c) Dip direction and amount of dip only

d) Strike direction, dip direction and dip amount **Marks :(1)**

**Ans:** d) Strike direction, dip direction and dip amount

**Que 7:**



**Analyse the above figure and delineate the stages involved in the formation of the unconformity. Marks :(4)**

**Ans:** i. a set of rocks was deposited

ii. these rocks were uplifted, tilted and folded

iii. erosion removes the uplifted portion of the sedimentary layers and the rocks were eroded down to a level surface

iv. subsidence and deposition of new sediments occur on top of the eroded surface and younger set of rocks was laid down on top after a long interval (unconformity)

**Que 8: The force exerted on a material object is termed as stress, which in turn results in its deformation. Describe the different stages of rock deformation.**

**Explain with the help of a diagram.**

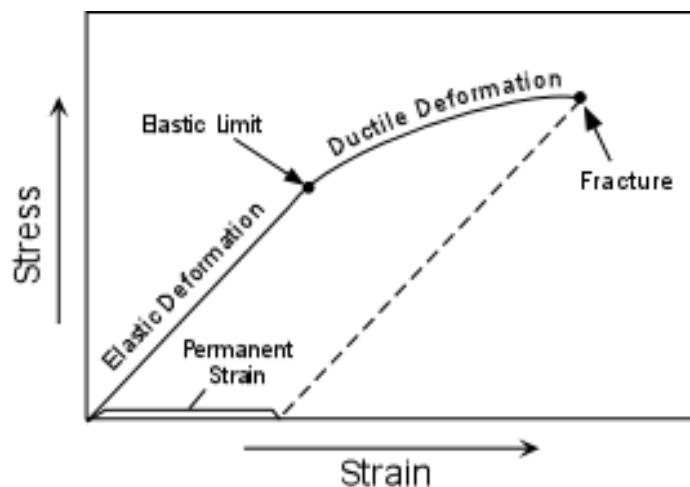
**Marks : (4)**

**Ans:** Elastic; plastic or ductile; rupture or fracture are the three types of deformation.

Elastic:- the body resumes its original size and shape when the stress is removed.

Plastic:- permanent change in shape occurs when the deforming stress is released.

Fracture:- material breaks after stress.



**Que 9: Define the following terms.**

**Marks : (3)**

**(a). Strike of beds**

**(b). Outcrop**

**(c). Stratification**

**Ans:** (a). The direction of intersection of bedding plane with an imaginary horizontal plane.

(b). Exposure of bedrock on the earth's surface

(c). Formation, accumulation or deposition of earth materials in layers

**Que 10: Fill in the blanks**

(a). A fault in which the hanging wall appears to have moved upwards is termed as -----

(b). In a -----, the rock beds above and below the surface of unconformity are parallel.

(c). ----- types of joints are typical of basaltic rocks.      **Marks :(3)**

**Ans:** (a). Reverse fault

(b). Disconformity/Parallel unconformity

(c). Columnar joints

**Que 11: (a). What is meant by attitude of rock beds?**

**(b). How is the strike direction related with the true dip direction?**

**(c). Differentiate between dip and plunge.                      Marks :(3)**

**Ans:** (a). Orientation or position of a structural feature relative to the horizontal.

(b). True dip is the inclination measured at perpendicular to the strike direction in a vertical plane.

(c). Dip denotes the angle that a structural planar feature makes with the horizontal, while plunge is the inclination of a linear feature (one dimensional)