

PRACTICALS

Practical No	Name of the Exercise
1	Study of Physical Properties of Minerals. (Colour, streak, lustre, form, fracture, cleavage, hardness, specific gravity)
2	Study of Ore Minerals
3	Study of Industrial Minerals
4	Study of Textures and Structures of Igneous Rocks
5	Study of Textures and Structures of Sedimentary Rocks
6	Study of Textures and Structures of Metamorphic Rocks
7	Study of Horizontal series of Geological Map
8	Study of Inclined series of Geological Map
9	Study of Seismic Zones of India
10	Identification of Geological Features from Satellite/Aerial photos
11	Calculation of the groundwater available for recharge
12	Calculation of Epicentre
13	Field work/ viva voce
14	Certified Journal

General Instructions for Teachers :

- 1) Mineral specimens which show required Physical properties should be used.
- 2) Rock specimens should clearly show the textures, structures and engineering properties clearly.
- 3) For section drawing use Geological map no.1 to map no. 9 from this textbook.
- 4) Use the outline map of India for marking seismic zones of India.
- 5) Use Landsat image or Aerial photograph for identification of geological features.
- 6) Use given data for location of Epicentre.
- 7) Use given data for calculation of availability of water for groundwater recharge.
- 8) Teachers should strictly follow the rules for educational visit, given by concerned authorities.

General instructions for Students :

- 1) Make the best use of time available for performing experiments.
- 2) Bring geometrical instruments, colour pencils and journals.
- 3) Handle the specimen carefully. Do not mark or write on specimens.
- 4) Draw neatly labelled diagrams wherever necessary in the journal.
- 5) Use Geological maps from this textbook for drawing sections.

Practical No.1

Study of Physical properties of Minerals.

Practical No.2

Study of Ore minerals.

(Hematite, Magnetite, Pyrite, Pyrolusite, Psilomelane, Chalcopyrite, Malachite, Galena, Sphalerite, Bauxite)

(Refer to Chapter no.5)

Practical No.3

Study of Industrial Minerals.

(Coal, Gypsum, Kaolinite, Feldspar, Quartz, Garnet, Corundum, Kyanite, Zircon, Diamond, Muscovite, Biotite, Sulphur and Cinnabar)

(Refer to Chapter no. 5)

Practical No.4

Study of Texture and Structures of Igneous Rocks.

(Phaneritic, Porphyritic, Vesicular, Amygdaloidal, Ropy and Pillow)

(Refer to Chapter no. 2)

Practical No.5

Study of Textures and Structures of Sedimentary Rocks.

(Clastic, Lamination, Stratification, Cross bedding, Graded bedding, Ripple marks)

(Refer to Chapter no. 2)

Practical No.6

Study of Structures of Metamorphic Rocks.

(Schistose, Granulose, Gneissose)

(Refer to Chapter no. 2)

Practical No.7 and 8

Study of Geological Maps and section drawing.

(Use Map no. 1 to 9 from this textbook)

Practical No.9

Study of Seismic Zones of India.

(Refer to Chapter no. 7)

Practical No.10

Identification of Geological features from Satellite image/Aerial Photograph.

(Refer to Chapter no. 8 - Plates 1, 2, 3 and 4)

Practical No.11

Calculate the water available for Groundwater Recharge.

(Refer to Chapter no. 6)

Practical No.12

Calculate Epicentre

(Refer to Chapter no. 7)

Practical Question paper pattern

Marks = 30

Time = 3 Hrs.

Q. 1. A) Identify and describe ore minerals from table no. 1 to table no. 3. **- 3 Marks**

B) Identify and describe industrial minerals from table no. 4 to table no. 7. **- 4 Marks**

Q. 2. Identify rock specimens from table no. 8 to table no. 11 and describe their colour, texture, Structures and classification.

- 4 Marks

Q. 3. Draw the Geological section of given map and describe topography, history and order of superposition.

a) Inclined series - 1 map **- 7 Marks**

b) Horizontal series - 1 map
(only description) **- 2 Marks**

Q. 5. Name the sites/zones in given outline map of India.

a) Seismic zones **- 1 Mark**

Q. 6. Calculate the

a) Epicentre **- 1 Mark**

b) Ground water available for recharge **- 1 Mark**

Q. 7. Identify and name features from given satellite image. **- 1 Mark**

Q. 8. Field work/project and Viva voce. **- 4 Marks**

Q. 9. Certified journals. **- 2 Marks**



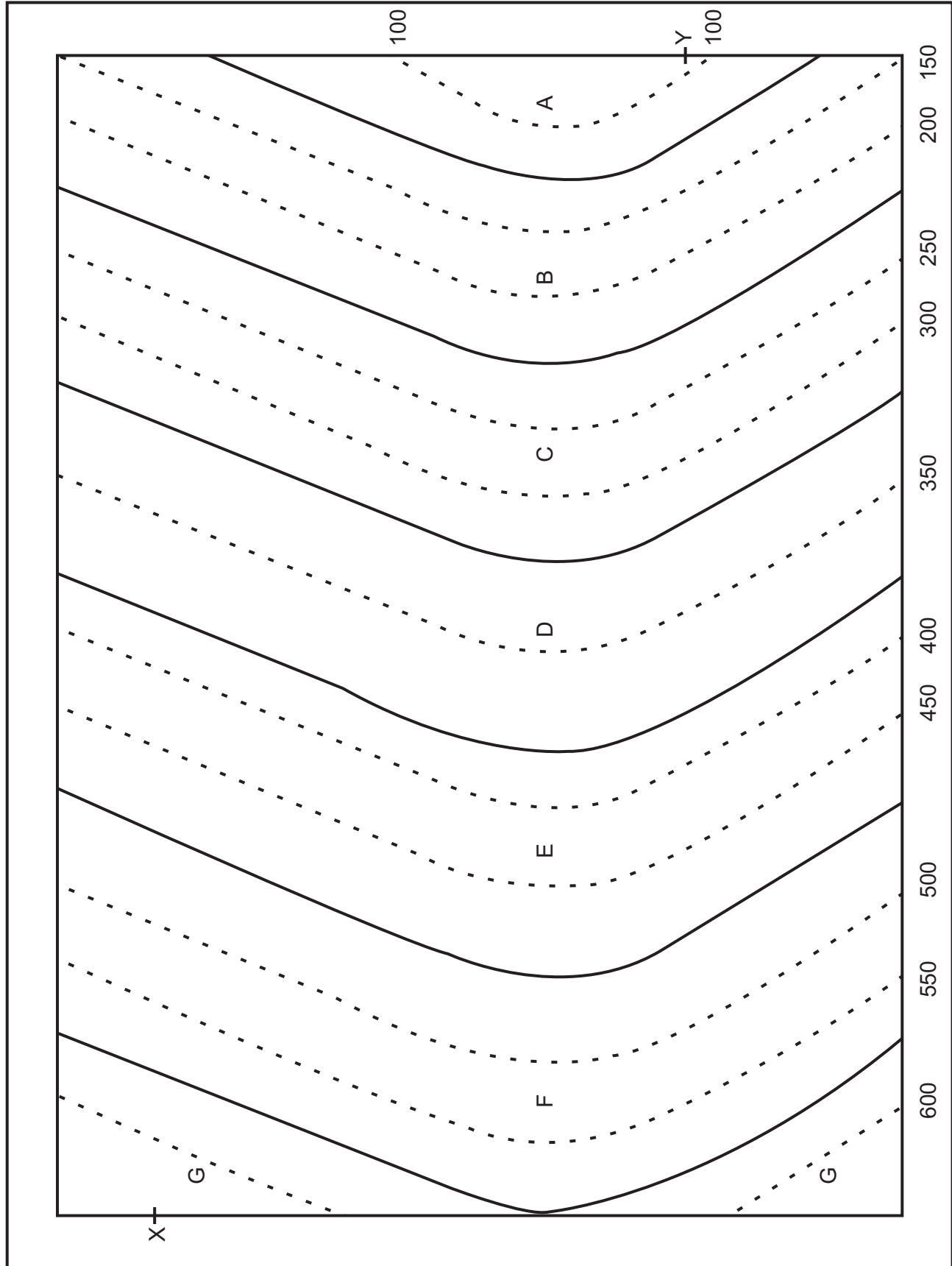
MAP NO. 1

Order of
superposition
and thickness
of beds

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Scale:
1 cm = 100 m



MAP NO. 2

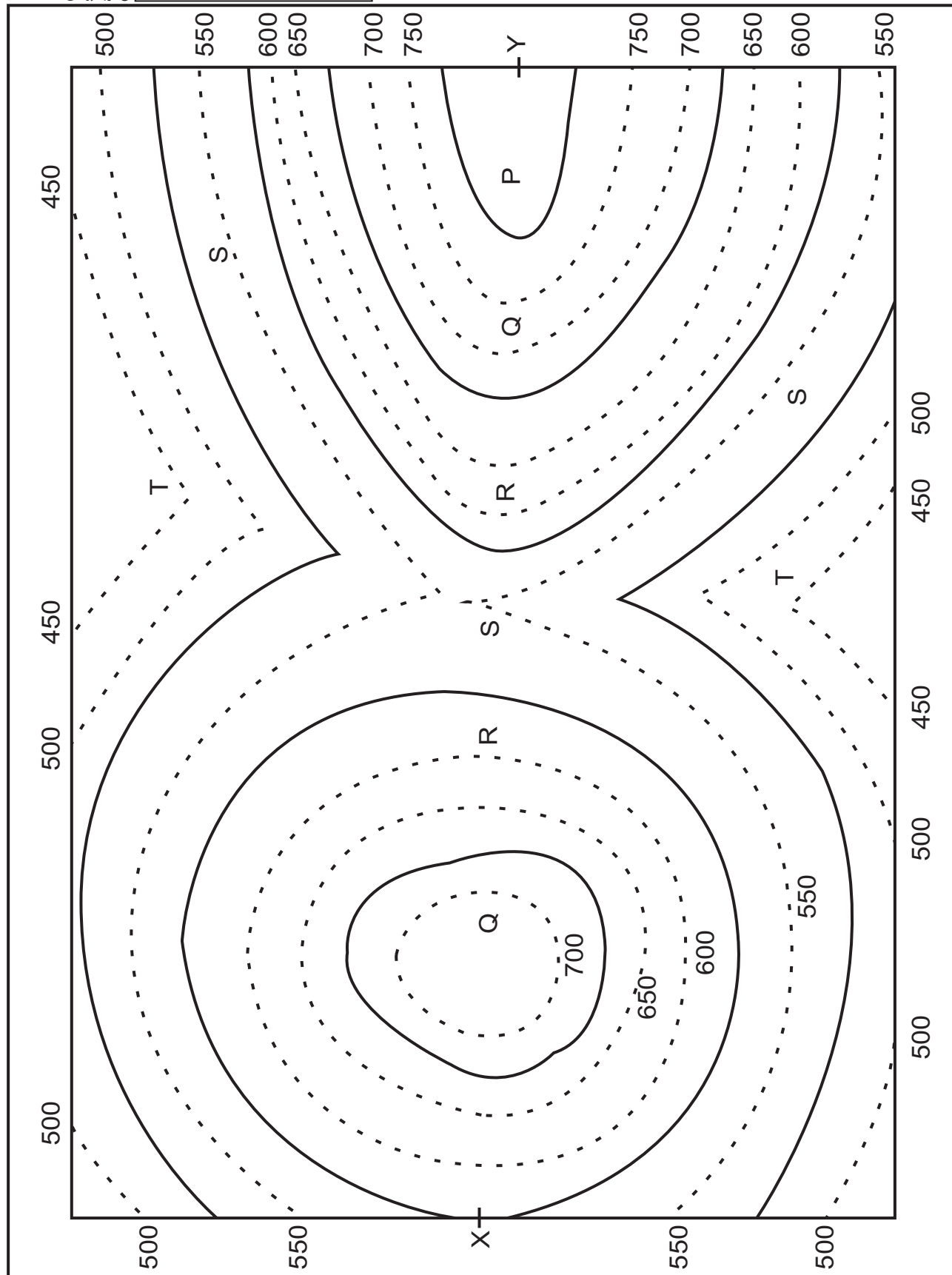
Order of
superposition
and thickness
of beds

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Scale:
1 cm = 100 m
CI = 50 m

1. Describe the
topography
2. Draw topo-
graphy along
X-Y



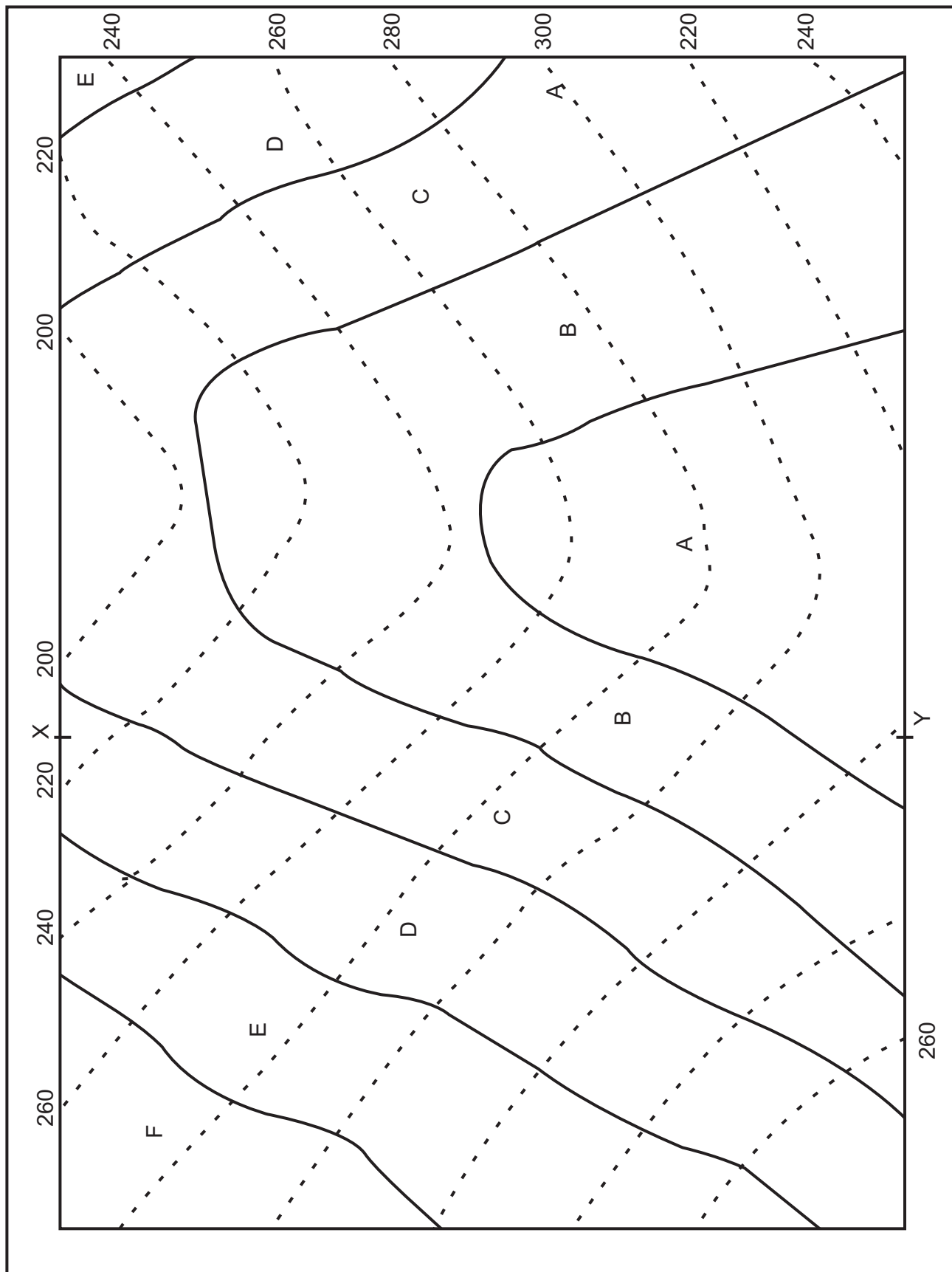
MAP NO. 3

Order of
superposition
and thickness
of beds

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Scale:
1 cm = 100 m

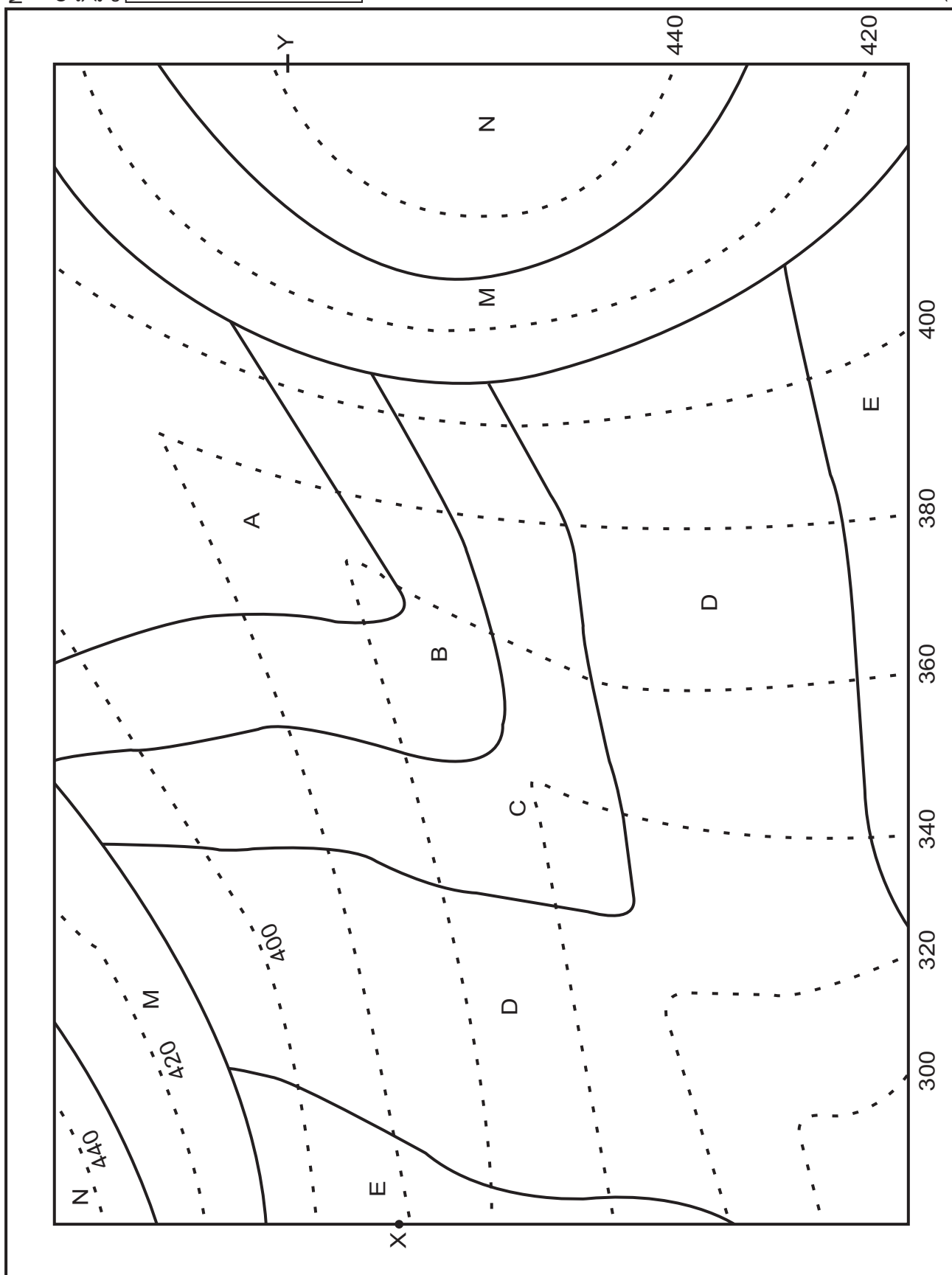


MAP NO. 4

Order of
superposition
and thickness
of beds



Scale:
1 cm = 100 m

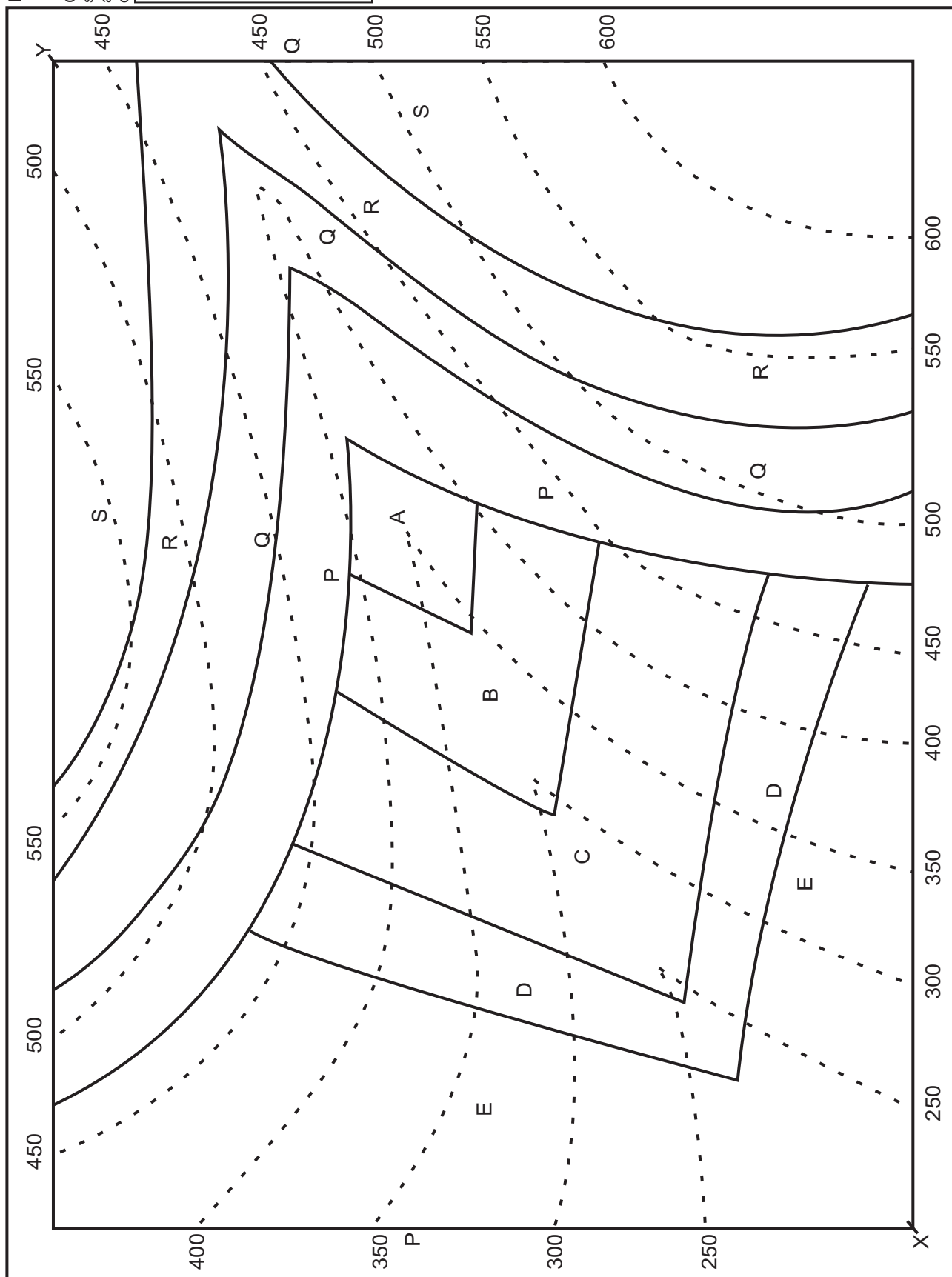


MAP NO. 5

Order of
superposition
and thickness
of beds



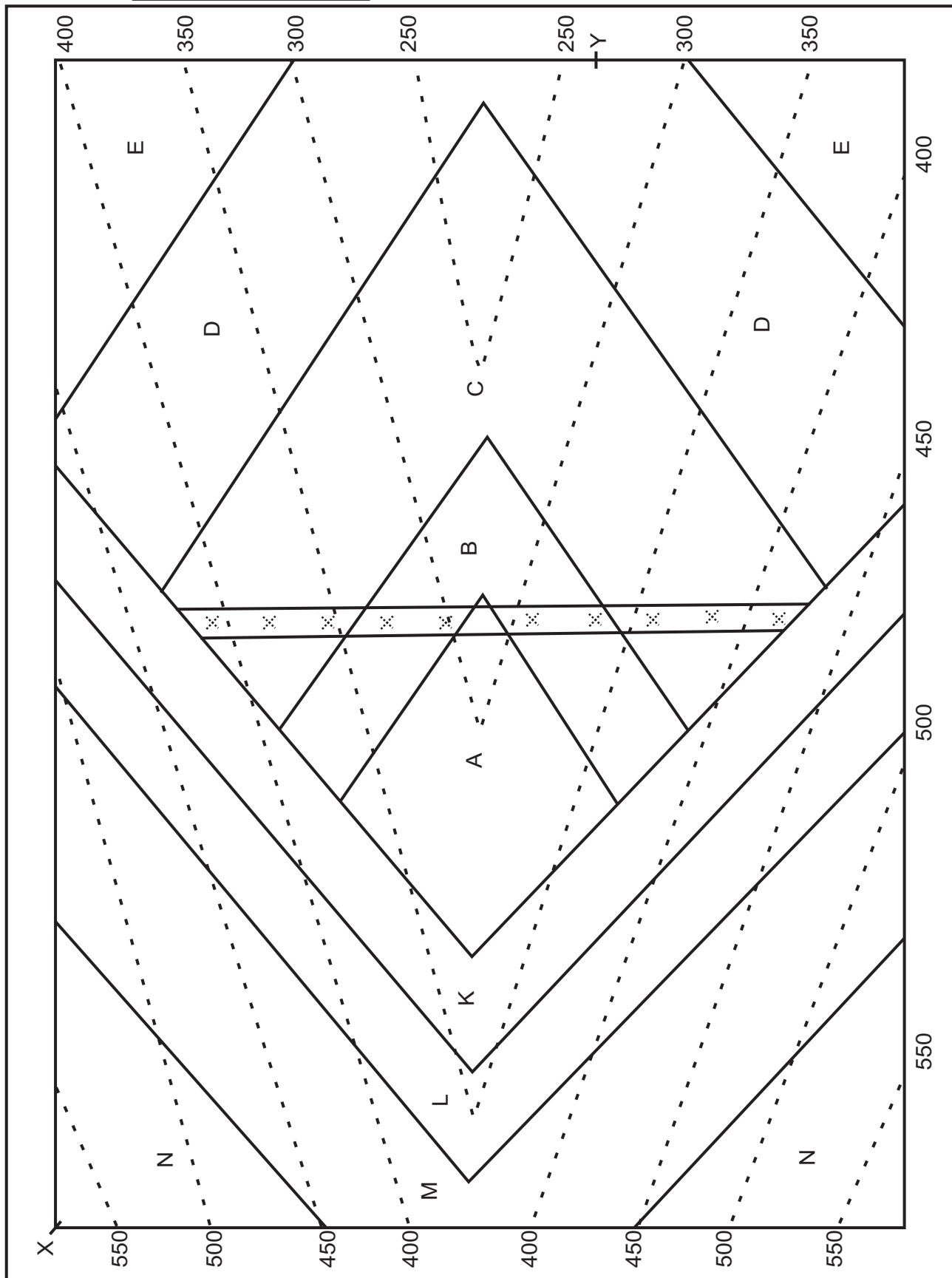
Scale:
1 cm = 100 m



Order of
superposition
and thickness
of beds



Scale:
1 cm = 100 m



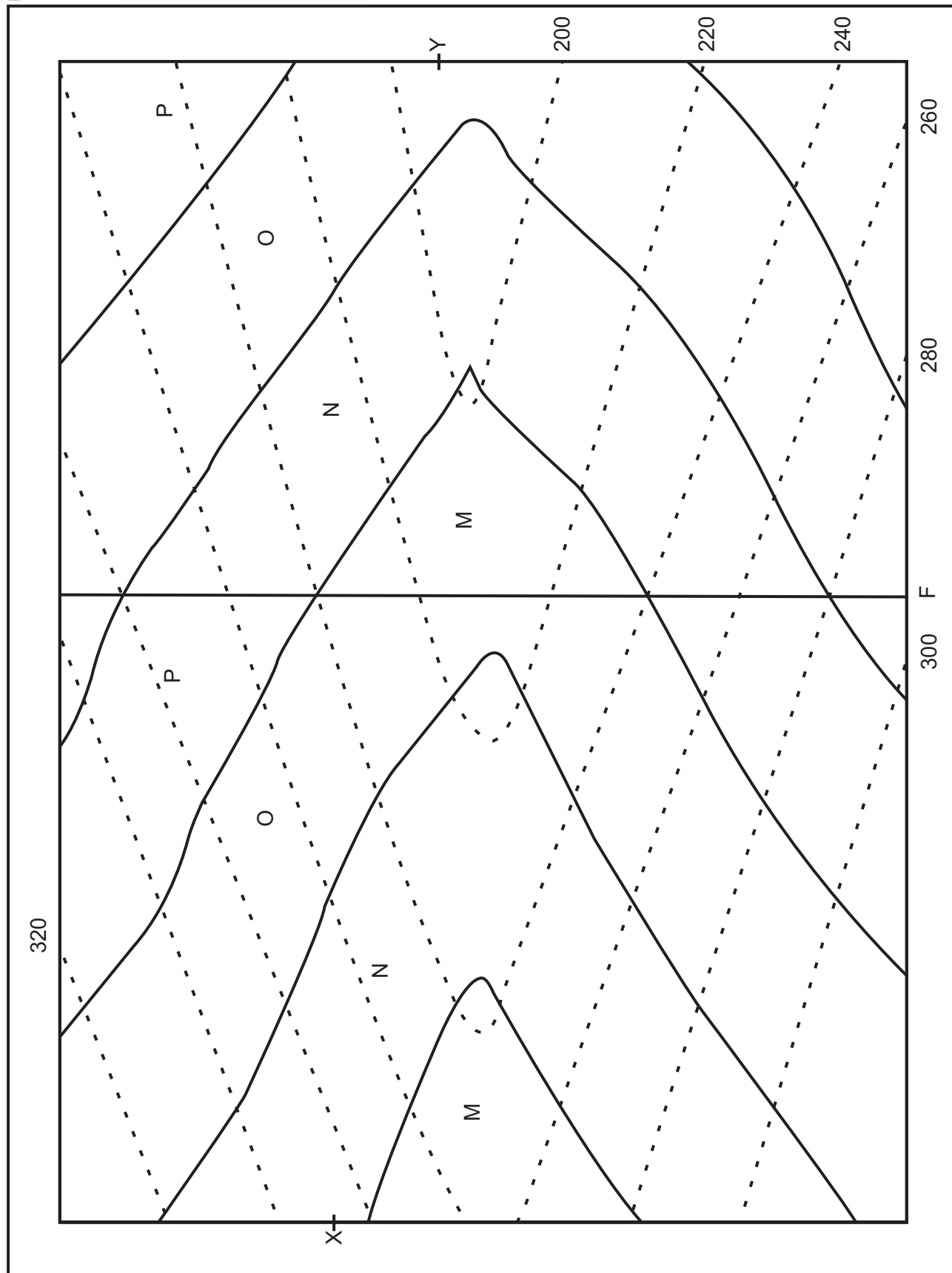
MAP NO. 7

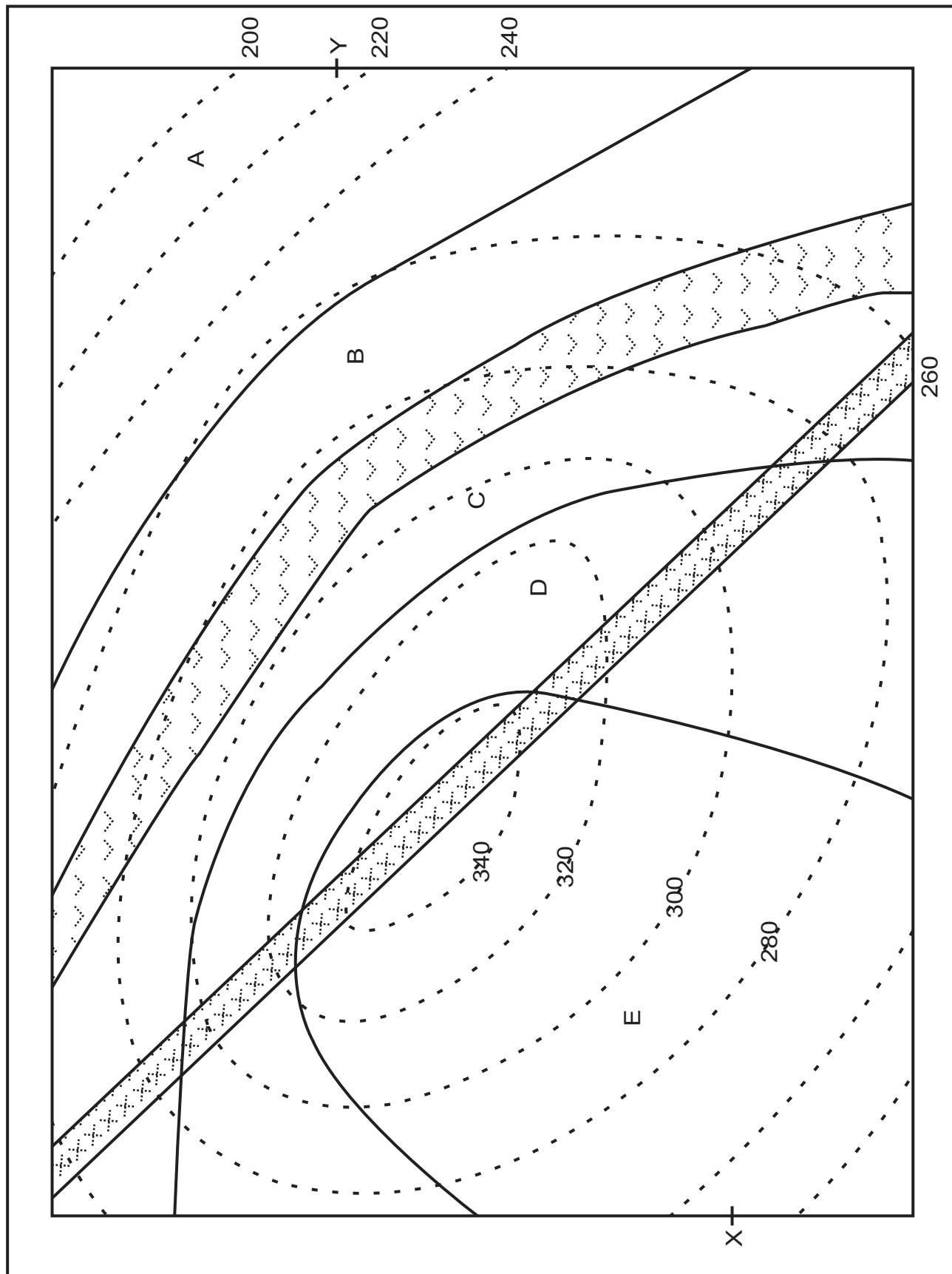
Order of
superposition
and thickness
of beds

Downthrown
direction is
Amount of
downthrow =



Scale:
1 cm = 100 m





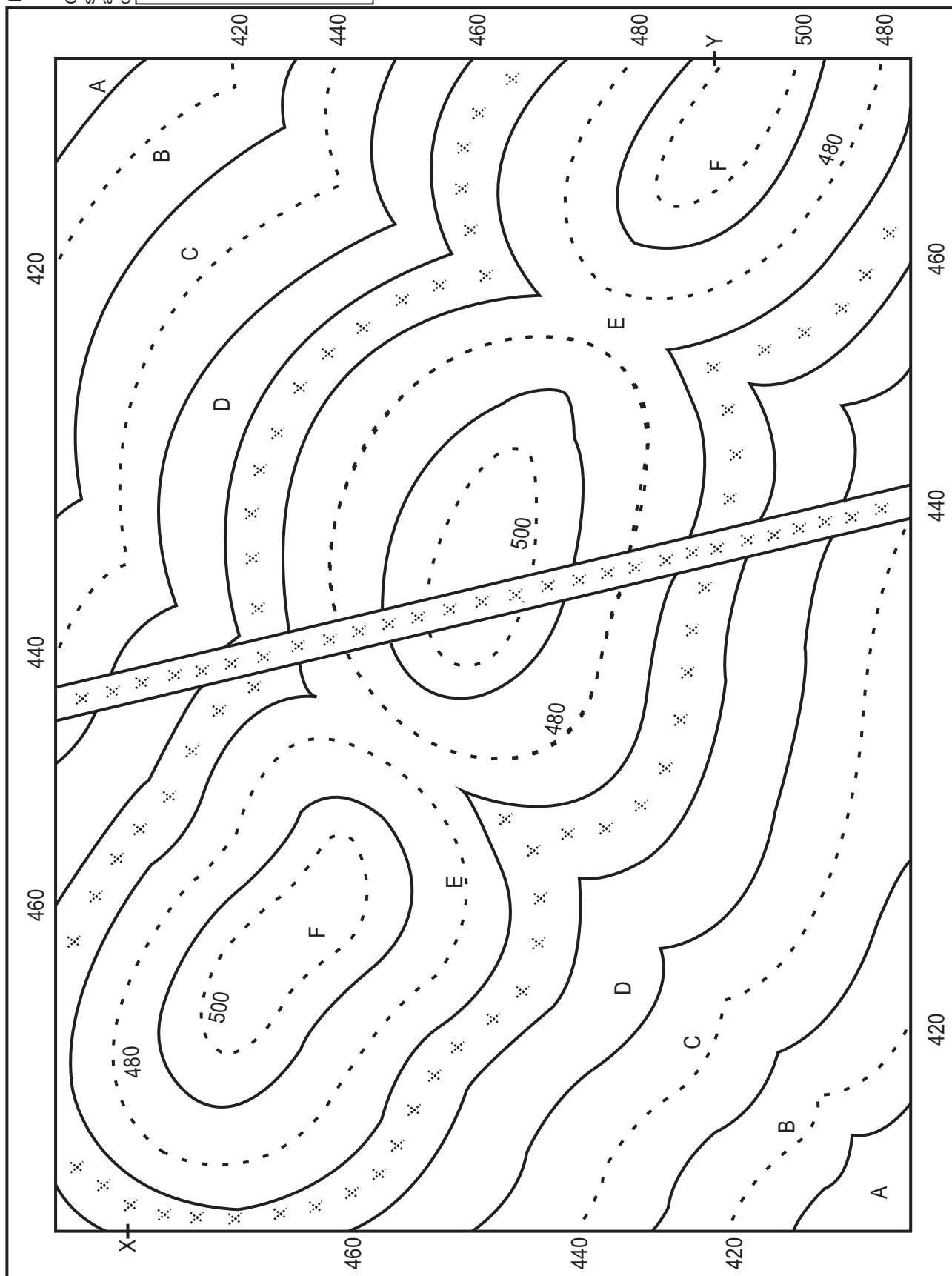
MAP NO. 9

Order of
superposition
and thickness
of beds

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Scale:
1 cm = 100 m



GLOSSARY

- **Advection** : The transfer of heat or matter by the flow of a fluid, especially horizontally in the atmosphere or the sea.
- **Albedo** : Is a measure of how much light that hits a surface is reflected without being absorbed.
- **Andesitic lava** : A high viscosity lava with high silica content.
- **Apparent polar wandering** : Is the perceived movement of the Earth's paleo-magnetic poles relative to a continent while regarding the continent being studied as fixed in position. ... In reality, the relative polar movement can be either real polar wander or continental drift (or a combination of both).
- **Arenites** : clastic rock with sand grain size between 0.0625 mm (0.00246 in) and 2 mm (0.08 in) and contain less than 15% matrix.
- **Argillite** : is a fine-grained sedimentary rock composed predominantly of hardened clay particles. They contain variable amounts of silt-sized particles.
- **Diatomites** : Naturally occurring fossilized remains of diatoms. Diatoms are single-celled aquatic algae.
- **Differentiation** : Is a complex process whereby a single melt can produce a wide variety of different igneous rocks.
- **Directed pressure** : Is non-uniform, i.e. it is not equal in all directions. It is caused by tectonic forces. Such forces cause the development of major structures such as folds and faults, as well as acting as metamorphic agent.
- **Emplaced** : Inclusion of igneous rock in older rocks, or the development of an ore body in older rocks.
- **Geodetic** : The scientific study of the size and shape of the Earth, its field of ztides.
- **Ichnofossils** : are an expression of the alteration of all textural and structural features in sedimentary rocks by living organisms. Often the organism that produced these structures leave no skeletal remains and hence the products of their activities are known as "trace" fossils.
- **Lahar** : a destructive mudflow on the slopes of a volcano.
- **Nebula** : A nebula is a giant cloud of dust and gas in space.
- **Phyllite** : Is a type of foliated metamorphic rock created from slate that is further metamorphosed so that very fine grained white mica achieves a preferred orientation.
- **Primordial** : Existing in or persisting from the beginning
- **Pyroclastic** : Is a fast-moving current of hot gas and volcanic matter that moves away from a volcano.
- **Radiolarian ooze** : A deep-sea ooze in which at least 30 per cent of the sediment consists of the siliceous radiolarian tests.
- **Rudites** : is a general name used for a sedimentary rock that are composed of rounded or angular detrital grains, i.e. granules, pebbles, cobbles, and boulders, which are coarser than sand in size.
- **Specific yield** : is defined as the volume of water released from storage by an unconfined aquifer per unit surface area of aquifer per unit decline of the water table.
- **Strategic deposits** :
- **Structural traps** : is a type of geological trap that forms as a result of changes in the structure of the subsurface, due to tectonic, gravitational and compactional processes.
- **Tephra** : rock fragments and particles ejected by a volcanic eruption.
- **Yield strength** : the stress at which a specific amount of plastic deformation is produced.



BIBLIOGRAPHY

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