GOVERNMENT POLYTECHNIC JAJPUR

Laboratory Manual for 6th Semester

DEPARTMENT OF MINING

CONTAINS:-

Aim of the experiment:

To determine the megascopic identification of igneous rocks.

Rock specimen No.1

(i) Colour :- Melanocratic
(ii) Texture :
    (a) Crystalline :- Merocrystaline
    (b) Grain Size :- Fine
    (c) Grain Shape: - Not identified individual grains are too small to identified.
    (d) Mutual relationship :- Equigranular
(iii) Mineralogy : - Augite, Plagioclase, Olivine (essential mineral)

Conclusion:

From the above experiment the rock specimen is known as **Basalt.**

Aim of the experiment:

To determine the megascopic identification of igneous rocks.

Rock specimen No.2

(i) Colour :- Mesocratic
(ii) Texture :

(a) Crystallinity: - Merocrystaline

(b) Grain Size: - Coarse

(c) Grain Shape: - Euhedral

(d) Mutual relationship:- Inequigranular

(iii) Mineralogy : - Quartz, Feldspar, Mica (essential mineral)

Conclusion:

From the above experiment the rock specimen is known as **Pegmatite.**

Aim of the experiment:

To determine the megascopic identification of igneous rocks.

Rock specimen No.3

(i) Colour :- Mesocratic
(ii) Texture :
  (a) Crystallinity :- Holocrystaline
  (b) Grain Size :- Fine
  (c) Grain Shape: - Anahedral
  (d) Mutual relationship :- Inequigranular

(iii) Mineralogy: - Augite, Plagioclase (essential mineral)

Conclusion:

From the above experiment the rock specimen is known as **Dolerite.**

Aim of the experiment:

To determine the megascopic identification of igneous rocks.

Rock specimen No.4

(i) Colour:- Melanocratic

(ii) Texture:

(a)Crystalline: - Holocrystaline

(b)Grain Size: - Coarse to medium

(c)Grain Shape: - Anahedral

(d)Mutual relationship: - Equigranular

(iii) Mineralogy: - Plagioclase, Pyroxene, Magnetite (essential mineral)

Conclusion:

From the above experiment the rock specimen is known as **Gabbro.**

Aim of the experiment:

To determine the megascopic identification of igneous rocks.

Rock specimen No.5

(i) Colour :- Mesocratic

(ii) Texture:

(a) Crystallinity :- Holocrystaline
(b) Grain Size :- Medium
(c) Grain Shape: - Euhedral
(d) Mutual relationship :- Equigranular

(iii) Mineralogy: - Biotite, Pyroxene, Amphibole (essential mineral)

Conclusion:

From the above experiment the rock specimen is known as **Lamprophyre.**

Aim of the experiment:

To determine the megascopic identification of igneous rocks.

Rock specimen No.6

(i) Colour :- Leucocratic
(ii) Texture :
  (a) Crystallinity :- Holocrystaline
  (b) Grain Size :- Fine
  (c) Grain Shape: - Euhedral
  (d) Mutual relationship :- Inequigranular
(iii) Mineralogy : - Alkali-feldspar, Oligoclase (essential mineral)

Conclusion:

From the above experiment the rock specimen is known as **Trachyte.**

Aim of the experiment:

To determine the megascopic identification of igneous rocks.

Rock specimen No.7

(i) Colour :- Leucocratic

(ii) Texture :

(a) Crystallinity :- Merocrystaline

(b) Grain Size :- Coarse

(c) Grain Shape: - Subhedral

(d) Mutual relationship :- Equigranular

(iii) Mineralogy : - K-feldspar, Oligoclase (essential mineral)

Conclusion:

From the above experiment the rock specimen is known as **Syenite.**

Aim of the experiment: -

To determine the mega-scopic identification of sedimentary rocks.

Rock Specimen:-1

(a) Colour : Variable
(b) Nature : Consolidated Gravels
(c) Mineralogy: Silica, calcium carbonate, Iron oxide.
(d) Texture : Very coarse grained

Conclusion:-

From the above experiment the rock specimen is known as "**Conglomerate**".

Aim of the experiment: -

To determine the mega-scopic identification of sedimentary rocks.

Rock Specimen:-2

(a) Colour : Variable according to type of cementing material
(b) Nature : Arenaceous
(c) Mineralogy: Quartz, feldspar ,mica ,garnet
(d) Texture: Sandstone are composed almost entirely of well sorted.

Conclusion:-

From the above experiment the rock specimen is known as "**Sandstone**".

Aim of the experiment: -

To determine the megascopic identification of sedimentary rocks.

Rock Specimen:-3

(a) Colour : White, grey or cream

(b) Nature : Calcareous rocks

(c) Mineralogy: Calcium carbonate, magnesium carbonate.

(d) Texture: Fine grained.

Conclusion:-

From the above experiment the rock specimen is known as "**Limestone**".

Aim of the experiment:-

To determine the megascopic identification of sedimentary rocks.

Rock Specimen:-4

(a) Colour : red, brown, yellow

(b) Nature : Arenaceous

(c) Mineralogy: Aluminium, iron hydroxide , silica.

(d) Texture: porous and concretionary.

Conclusion:-

From the above experiment the rock specimen is known as "**Laterite**".

Aim of the experiment: -

To determine the mega-scopic identification of sedimentary rocks.

Rock Specimen:-5

(a) Colour : Variable
(b) Nature : Argillaceous
(c) Mineralogy: kaolinite , montmorillonite , quartz, mica ,chlorite.
(d) Texture: Very fine grain.

Conclusion:-

From the above experiment the rock specimen is known as "**Shale**".

Aim of the experiment: -

To determine the mega-scopic identification of metamorphic rocks.

Rock Specimen:-1

(a) Colour : Variable
(b) Nature : Fine grained
(c) Mineralogy: Mica, chlorite, quartz, feldspar
(d) Texture and structure: Grains are very fine grains rocks which show slaty cleavage.

Conclusion:-

From the above experiment the rock specimen is known as "**Slate**".

Aim of the experiment: -

To determine the mega-scopic identification of metamorphic rocks.

Rock Specimen:-2

(a) Colour : Variable
(b) Nature: Fine grained and foliated lustrous rock.
(c) Mineralogy: Quartz, muscovite, chlorite
(d) Texture and structure: It is a very fine grained rock showing foliated structure.

Conclusion:-

From the above experiment the rock specimen is known as "**Phyllite**".

Aim of the experiment: -

To determine the mega-scopic identification of metamorphic rocks.

Rock Specimen:-3

(a) Colour : Varies according to mineral composition
(b) Nature : Coarse grained
(c) Mineralogy: Quartz, muscovite, biotite
(d) Texture and structure: Coarse grained rocks having a prominent schistose structure.

Conclusion:-

From the above experiment the rock specimen is known as "**Schist**".

Aim of the experiment: -

To determine the mega-scopic identification of metamorphic rocks.

Rock Specimen:-4

(a) Colour : Light
(b) Nature : Coarse grained
(c) Mineralogy: Quartz and feldspar
(d) Texture and structure: Coarse grained rocks having gneissose structure.

Conclusion:-

From the above experiment the rock specimen is known as "**Gneiss**".

Aim of the experiment: -

To determine the mega-scopic identification of metamorphic rocks.

Rock Specimen:-5

(a) Colour : Light
(b) Nature : Hard, dense, siliceous
(c) Mineralogy: Quartz, mica, tourmaline, graphite, iron minerals.
(d) Texture and structure: Compact rock of interlocking quartz grains and having granulose structure.

Conclusion:-

From the above experiment the rock specimen is known as "**Quartzite**".

Rock Specimen:-6

(a) Colour : Pink, yellow, grey, black, green
(b) Nature : Crystalline calcareous
(c) Mineralogy: Calcite and dolomite.

(d) Texture and structure: Granular texture and calcite cleavage.

Conclusion:-

From the above experiment the rock specimen is known as "**Marble**".

AIM OF THE EXPERIMENT:-

To determine the interpretation of contour maps and preparation of profile section for it.

THEORY:-

- The most useful features on the map for navigating in the mountains is the contour line.
- Contour features can nearly always be identified on the ground even when covered in snow.
- A contour line is a line on the map joining points of equal height. The vertical interval is the height between each contour, this will be down on the map.
- There is a five no. of types of contour features :-
  - (i) Ring contours partly knolls and hills
  - (ii) Cols or saddles
  - (iii)Gentle slope (GS)
  - (iv)Medium slope (MS)
  - (v)Steep slope (SS)

Contour interpretation is about relating the contour features on the map to the real features on the ground. This can be done in 3 main layer ways:-

- By evaluating the ground on your feet, defining what type of features it forms and then identifying it on the map. This can be done in both good and poor visibility.
- In good visibility, by looking at features beyond your immediate location, and identifying them on the map.
- The poor visibility, by examining the contour features on the map and then forming a mental picture of what the ground ahead of you would look if the visibility was good.

Conclusion:-

From the above experiment I have get to know about the interpretation of contour maps and the profile section.

MAP No. 1

Aim of the experiment:-

To describe the geology of the area exposed in the map and to a draw a suitable profile and a section to represent the bed exposed in the Map.

SCALE :- 1’ = 1000’’

Physiography:-

In this map the height points are represented by a height of 800ft while the lowest point are represented by of 400ft. Hence the relief feature of area is about 400ft. There are two hills present in this map one at the western end of height 800ft and another at eastern end height 700ft. In between the two hills a valley is present.

Structure :-

There are 3 beds exposed in this map is namely shale, limestone, grit. The bed strike in the direction North-South, which is dip towards east with an amount.

Stratigraphy:-

The stratigraphy of the area can be given as follows.

Younger

↑

Shale

Limestone

grit

Oldest

Thickness of beds:-

Bed	Thickness
Shale	cannot be determined
Limestone	200ft

Grit	Cannot be determined

Conclusion:-

Since Grit bed is oldest, it must have been deposited first followed by limestone and shale to give rise to the present set up.