1) Name of the Rock : GRANITE

Texture : The given Rock specimen is compeletly, made up of the mineral crystals so the texture is Holocrystalline. The mineral crystals are partly developed, with suggest its hypidiomorphic texture. it is a medium to coarse grain rock. and it is leucocratic in colour.

Mineral constituents :

1. Quartz : Colourless, oily looking crystals with vitreous lustre.
2. orthoclase : White or Pink crystals with subvitreous lustre.
3. Biotite : Black flakes with Pearly lustre.
4. Hornblende : Black grains or needles with vitreous Lustre.

Conclusion : The texture suggest in plutonic origine. Quartz is abundant with shows its acidic Nature It belongs to alkali series. due to the Presense of orthoclase felspar.

From the above data it can be said that the given rock specimen is of an acidic, Plutonic igneous rock known as granite.

## 3) PORPHYRITIC GRANITE

- Texture : As the rock is entirely composed of mineral crystal, the texture is holocrystalline. the Phenocryst of orthoclase are enclosed in granitic ground mass, so the texture is Porphyritic. the colour of the rock is leucocratic.

- mineral constituents :
  1. Quartz : colourless, oily looking crystals with vitreous lustre.
  2. orthoclase : dull white or pink Phenocryst with subvitreous lustre.
  3. Biotite : Black flakes with pearly lustre.

→ ground mass : The ground mass is made up of quartz, orthoclase, biotite etc., so it is a granitic ground mass.

- Conclusion : The texture & granitic ground mass suggest its plutonic origin. the silica percentage is high due to the presence of quartz, with suggest its acidic nature. it belongs to alkali series. due to the presence of orthoclase felspar.

From the above data it can be said that it is an Igneous rock granite, but it has characteristic porphyritic texture hence it is known as porphyritic granite.

5) GABBRO

- Texture : The rock is composed of mineral crystals, so the texture is holocrystalline. the mineral crystal are partly developed, hence it is hypidiomorphic. The colour of the rock is melanocratic.

- Mineral constituents :
  1. Plagio clase : subhedral crystals with subvitreous lustre and grayish black colour.
  2. Augite : Greenish black mineral with subvitreous lustre.

- Conclusion : The texture suggest its plutonic origine. Complete absence of Quartz & Presence of Plagio clase with Fe-Mg mineral suggest its basic nature. it belongs to Sodalime series due to the presence of plagioclase Felspar.

From the above data it can be said that the given rock specimen is of a basic, plutonic igneous rock known as gabbro.

4) SYENITE :

Texture : The rock is completely made up of mineral crystals, So the texture is holocrystalline the mineral crystals are partly developed, hence it is hypidiomorphic. the colour of the rock is leucocratic.

Mineral constituents :

1. orthoclase : pink or dull white crystals with subvitreous lustre.
2. Hornblende : Black grains or needles with subvitreous lustre.
3. Biotite : Black flakes with pearly lustre.

Conclusion : The texture suggest its plutonic origine complete absence of quartz & abundant presence of orthoclase felspar suggest its subacidic nature. it belongs to Alkali series to the presence of orthoclase.

From the above data it can be said that the given rock specimen is a subacidic, plutonic, igneous rock known as syenite.

## 16) BASALT :

- Texture : The given rock specimen shows fined grained Texture & melanocratic colour.

- mineral constituents : The mineral constituents of the rock can not be identify by naked eye as the rock possesses fined grain texture. The melanocratic colour may be due to the presence of Plagioclase & Augite.

- Conclusion : The Texture suggest its volcanic origin. complete absence of quartz and melanocratic colour suggest its basic nature. The felspar present in the rock may be plagioclase. Thus the rock belongs to the Sodalime series.

From the above data it can be said that it is basic, volcanic igneous rock known as basalt.

[ If the Rock contains vesicles with fine grained Texture is known as vesicular basalt. If it is fine grained where vesicles have been filled up by some secondary minerals like calcite, zeolite, quartz etc.) giving rise to amygdaloidal texture & the rock is called amygdaloidal basalt. If the Phenocryst of plagioclase felspar are found & closed in the fined grain ground mass The texture is porphyritic & the rock is Porphyritic basalt.]

## 17) RHYOLITE

- **Texture** : The rock shows porphyritic texture as the phenocryst of quartz and sanidine are enclosed in fine grained ground mass. sometimes rock shows flow structure. The colour of the rock is leucocratic.

- **mineral constituents** :
  1. Quartz : oily looking grains with vitreous lustre.
  2. ground mass : The rock contains brownish to dull-white groundmass composed of minute crystals of quartz and sanidine & glassy material.

- **Conclusion** : The Texture suggest its volcanic origine. presence of quartz suggest its acidic nature. It belongs to the Alkali series due to the presence of sanidine felspar.

  From the above data it can be concluded that the given rock specimen is an acidic volcanic igneous rock known as rhyolite.

11) DOLERITE

Texture : The given specimen show grain size, which is neither so coarse grains as plutonic rock nor so fine grain as volcanic rock. The intermediate grain size suggest that it is a hypabyssal rock. The colour of the rock is melanocratic.

mineral constituents : The mineral constituents may be identify by necked eye. They may be plagio clase and Augite as an essential minerals and olivine or mica or hornblende as an accessory minerals as to the name of the rock.

conclusion : The texture suggest its hypabyssal origin. complete absence of quartz and presence of plagioclase with Fe-mg minerals, show its basic nature, it belongs to sodalime series due to the presence of plagio clase feldspar.

from the above data it can be said that the given rock specimen is a basic, hypabyssal igneous rock known as Dolerite.

4) SCORIA :

Texture : Porphyritic

The given rock is a dark, glass rich vesicular. The rock is of light weight due to numerous macroscopic ellipsoidal vesicles. Vesicularity results from the exsolution of magmatic volatiles prior to chilling. The rock is normally dark, Brown, Black or Red in Colour and dense. It may be part of lava or as a fragmental ejecta. (bomb or lapilli) It is composed of glassy - fragments with phenocrysts. lapilli or bomb of basic composition is related to basaltic or andesetic composition from the texture it is concluded that the rock is of volcanic origin & the rock is scoria.

20) SANDSTONE

Texture : clastic

The given rock specimen show stratification which suggest its sedimentary origin. There is a alternate bands of white and brown colour material giving rise to different strata.

The rock is composed of quartz grain which can be identify by its vitreous lustre, hardness & oily looking nature. the brown colour of the rock is due to ferruginous cementing metrix. around the quartz grains.

Conclusion : The texture suggest its sedimentary origin. the quartz grains are sub angular to sub rounded. the grain size of the rock suggest arenaceous group. (grain size up to 2 mm.)

From the above data it can be said that it is a sedimentary rock known as sand stone.

21) SHALE

Texture : Clastic

The given rock specimen show lamination suggesting its sedimentary origin. the Colour of the rock is according to the Colour of the laminae. The laminae are dull white or reddish brown in colour. the brown Colour is due to the ferrugenous material. the grain size of the rock is extremely fine-grain indicating its clayey nature. the The grain size of the rock suggest its argillaceous group.

From the above dates it can be concluded that the given rock specimen is of sedimentary origin known as shale.

22) LIME STONE

Texture : NON clastic.

The given rock specimen is dark grey. (black, greenish black) in colour. and it is compact. the grain size varies from fine to medium grain. it can be scratched easily by Penknife, which suggest its Calcareous nature. further it gives effervences of $CO_2$ with dilute HCl. Sometimes it contains impressions of fossils suggesting its fossiliferous nature.

From the texture and mineral constituents (calcite) it can be said that the given rock specimen is of sedimentary origin known as fossiliferous limestone.

## 17. CONGLOMERATE

**Texture** : The given rock specimen is composed of pebbles of quartz cemented together by means of siliceous or calcareous or ferruginous cementing metrix this suggests its sedimentary origin.

As the rock is composed of quartz pebbles it belongs to rudaceous (grain size >2mm type of rocks. the cementing metrix is white in colour and it can not be scratched by penknife. so the metrix is siliceous. (If the cementing metrix is in white in colour and can be scratched by pen knife the metrix is calcareous and if the cementing metrix is brownish or redish in colour then it is ferruginous.)

**Conclusion** : The clastic texture suggest its sedimentary origin. rudaceous nature of the rock and rounded pebbles suggests that the given rock specimen is of conglomerate.

## 14) SLATE

- Texture : slaty, schistose.

Texture is also fine grained, so that the mineral constituents cannot be identify by naked eyes.

The rock is black, green or red or grey in colour. the rock is hard, dense & compact containing carbonaceous matter. because of extremely fine grain size mineral constituents cannot be identify but generally the rock possess platy minerals like mica - biotite, chlorite, sericite etc. as well as quartz and graphite.

Most slates break along regular planes of weakness, (leaved structure). giving rise to slaty cleavage. the planes of cleavage are at right angles to the direction of greatest pressure.

- Conclusion : The presence of slaty cleavage in the rock suggest the metamorphic origin. From the above data it can be said that it is a metamorphic rock known as slate.

Argillaceous rocks when subjected to low grade metamorphism gives rise to slate.

25) PHYLLITE

Texture : schistose.

Phyllites are fine grained micaceous rock with a highly developed foliation intermediate in perfection between slaty cleavage & schistosity.

mineral constituents : fined grained sericite, chlorite, quartz and the other Assecories like Magnetite, Hematite, Ilmenite etc. found present. grained size and the texture suggest that the rock is phyllite.

conclusion : Phyllites are formed by low grade regional metamorphism of argillaceous rocks. Phyllites are of slightly higher metamorphic grain than slates and slightly lower than micaschist. the grains & the mica formed large enough flakes to impart a silky shine to the surface of schistosity.

## 26) SCHIST :-

- Texture : Schistose

The rock shows highly foliated nature with abundant divisional surfaces covered with mica.

- mineral constituents :

1) mica : Muscovite or biotite flakes are abundant and arranged in a linear fashion along layers.
2) quartz : it occurs as a small grains with vitreous lustre.
3) garnet : Small as well as big crystals with perfect faces enclosed in mica.

- Conclusion :

As the rock is heavy & highly foliated with metamorphic mineral like garnet, it is a metamorphic rock.

From the texture and mineral constituents it can be said that it is a metamorphic rock known as garnetiferous mica schist

[ Argillaceous rock when subjected to high grade metamorphism give rise to schist. ]

## 28) GNEISS :-

- Texture : gneissose. - Augen.

Alternate arrangement of bands of dark and light coloured minerals, suggest its gneissose texture, it is hard and very compact rock.

- mineral constituents :

1) Quartz : It can be identify by its oily nature & vitreous lustre.
2) orthoclase : It occur as dull white grains with sub vitreous lustre. it forms a band and it assumes a eye like structure known as Augen.
3) hornblende : dark coloured mineral in form of bands with quartz and felspar.

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- Conclusion :

As the rock is very heavy & compact with gneissose texture, it is a metamorphic rock.

From the above data it can be said that the given rock specimen is of metamorphic origin known as hornblende gneiss

[ If augen texture is present in the rock, rock is known as Augen gneiss. ]

29) MARBLE :

- Texture : GRANOBLASTIC.

It is white [ green, pink, gray, black ], compact, heavy and medium grain rock. it possess saccharoidal appearance. the rock is entirly composed of calcite which shows vitreous lustre. and can be scratched by penknife. it gives effervances of $CO_2$ with dilute HCl.

- Conclusion :

The compact nature and granoblastic texture suggest its metamorphic origin. the presence of only one mineral calcite leads to conclud that the given rock specimen is of marble.

30) QUARTZITE

Texture : GRANOBLASTIC

It is granullar, even grain, compact and heavy rock. The rock is entairly composed of quartz which occurs as irregular, equigranular, colourless mass, oily looking grains. The compact nature and granoblastic texture suggest its metamorphic origin.

From the above data it can be said that it is a metamorphic rock known as quartzite.