



Question one: Choose the correct answer (30-points-30 marks)

1- The angle between two neighboring faces is called.....			
A. Right angle	B. Interfacial angle	C. Solid angle	D. crystal angle
2- Triad (three-fold) axis: When rotation repeats form every degrees			
A. 120	B. 60	C. 90	D. 180
3- Substances that are characterized by regular arrangements of atoms are called.....			
A. amorphous	B. crystalline	C. solid	D. A&B
4- $3\text{mm}2\text{c}$ is the complete symmetry formula of system.			
A. tetragonal	B. hexagonal	C. cubic	D. orthorhombic
5- The normal class of tetragonal system has diad (two-fold) axes.			
A. 5	B. 9	C. 13	D. 4
6- Form consist of two parallel faces that intercept a axis and are parallel to c and b axes is called....			
A. c-pinacoid	B. b-pinacoid	C. a-pinacoid	D. all of them
7- Unequal crystallographic axes is a characteristic feature of.....system.			
A. tetragonal	B. cubic	C. orthorhombic	D. hexagonal
8- $3\text{mm}2\text{c}$ is the complete symmetry formula of system.			
A. tetragonal	B. cubic	C. hexagonal	D. orthorhombic
9- An open form having 4 faces that are parallel to the c axis is			
A. Tetragonal prism	B. C-pinacoid	C. Hexagonal prism	D. Trigonal prism
10- Mica minerals (e.g. muscovite) have set of cleavage.			
A. one	B. two	C. three	D. four
11- Constant colored minerals include			
A. quartz/	B. Sulfur	C. malachite	D. B&C
12- Quartz has a higher hardness than			
A. gypsum	B. fluorite	C. talc	D. all of them
13- Calcite, gypsum and quartz are characterized by luster.			
A. metallic	B. vitreous	C. pearly	D. resinous
14- Soap touch is a characteristic feature of			
A. talc	B. halite	C. graphite	D. phosphate
15- Halide minerals contain halogens, such as			
A. fluorite	B. graphite	C. barite	D. calcite
16- Pyrite has a brass-yellow color and..... Streak.			
A. yellow	B. Black	C. brown	D. green
17- Minerals that can be drawn into wires are called.....			
A. elastic	B. flexible	C. brittle	D. ductile
18- Chromite, galena and barite have specific gravity.			
A. low	B. medium	C. high	D. A&B
19- Limonite and kaolinite have Luster.			
A. metallic	B. earthy	C. vitreous	D. resinous
20- Magnetite and hematite belong to the group.			
A. oxides	B. carbonates	C. halides	D. silicates

21- Acidic magma is characterized by all the following except			
A. Na- K- and silica rich	B. Temperature is less than 800C	C. low viscosity	D. A&B
22- are late crystalline minerals from magma.			
A. Olivine-pyroxene	B. quartz-pyroxene	C. amphibole-biotite	D. quartz-muscovite
23- Ophiolite is a rock sequence that characterizes			
A. MOR	B. divergent tectonic movement	C. subduction zones	D. A&B
24- Komatiite and peridotite are rocks.			
A. ultrabasic	B. basic	C. intermediate	D. acidic
25- Cooling of magma at great depths forms rocks.			
A. hypabyssal	B. Extrusive	C. volcanic	D. plutonic
26- Large crystals embedded within a fine groundmass in igneous rocks define the texture.			
A. aphanitic	B. phaneritic	C. porphyritic	D. trachytic
27- The protolith of marble is			
A. Sandstone	B. limestone	C. shale	D. basalt
28- The maximum limit of metamorphism is			
A. 100-200° C	B. 700-900° C	C. 400-500° C	D. 500-600° C
29- The conditions 100 – 200° C and 6 kbar pressure refer to Metamorphism.			
A. Low grade	B. medium grade	C. high grade	D. very low grade
30- Texture of quartzite can be described as			
A. mosaic	B. granoblastic	C. equidimensional	D. all answers

Question 2: Mark as true (T) or false (F). (12 marks)

- 1- Changing the chemical composition after metamorphism is isochemical metamorphism.
- 2- Active fluids may cause metamorphism.
- 3- Cooling of magma at shallow depth gives rise to hypabyssal rocks.
- 4- Obsidian has a glassy texture.
- 5- The thickness of aureoles depends on nature and size of intruded magmatic body.
- 6- Phi values for grains coarser than one millimeter are negative.
- 7- Sorting refers to the sharpness or smoothness of the grains' corners.
- 8- The framework grains in breccias are composed of gravel-sized materials.
- 9- Exfoliation caused by pressure release is a chemical weathering process.
- 10- Carbonic acid reacts with quartz in limestone to form caves.
- 11- Sandstone consists of grains with sizes ranging from 1/16 to 1/256 mm.
- 12- Sedimentary rocks are loose solid particles derived by weathering and erosion.

Question three: Essay Questions (18 marks)

- a) Explain the causes of color variations in the same mineral.
- b) Compare between tetragonal and hexagonal systems with respect to crystallographic axes, crystallographic angles, and (C.S.F).
- c) Define diagenesis and discuss its major processes.

Best wishes