*Salahaddin University*
*College of Science*
*Department of Geology*
*2nd Class*

*Monthly Examination of*
*(Ign. & Met.) Petrology*
*Date: 17/4/2023*
*Time: 60 minutes*

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**Q1)** choose the correct answer between brackets **"40 mark"**

1. (**Low, Intermediate, High**) grade metamorphism takes place at temperatures between about 450 to 650°C.
2. In the (**slaty, schistose, gneissic**) texture of the metamorphic rocks, the sheet silicates become unstable and dark colored minerals like hornblende and pyroxene start to grow.
3. (**Pyroxene, Garnet, Muscovite**) is a hydrous mineral that eventually disappears at the highest grade of metamorphism.
4. Marble is a metamorphic rock composed of coarse-grained (**plagioclase, quartz, calcite**).
5. (**Lower limit, Upper limit**) of metamorphism is overlap with diagenesis processes of sedimentary rocks.
6. Non-foliated rocks found in contact metamorphic aureoles are called (**granofels, hornfels, slate, petrofels**).
7. In the post metamorphic textures if the rock is highly strained and the matrix become glassy, the (**cataclasite, mylonite, serpentinites**) term is used.
8. (**Batholith, Stock, Lopolith, Laccolith**) are large discordant bodies (surface exposure > 100 $km^2$) with dome-shaped roofs.
9. (**Metamorphism, Metasomatism**) water brings ions from outside the rock, and they are added to the rock during metamorphism. Other ions may be dissolved and removed.
10. (**Crater, Caldera, Volcano, Columnar Jointing**) is a depression near summit of volcano.

**Q2**) answer the following

a- Define injection and classify according to depth. **"6 mark"**

b- The size and shape of an aureole metamorphism is controlled by: **"9 mark"**

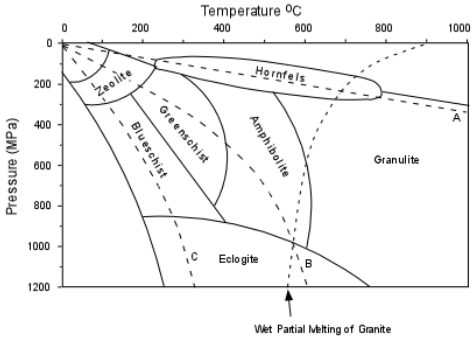
c- Write contact metamorphic facies from low to high grade **"6 mark"**

d- compare between lava flow and sill. **“10 mark”**

| | *Sill* | *Lava Flow* |
|---|---|---|
| *1* | | |
| *2* | | |
| *3* | | |
| *4* | | |
| *5* | | |

**Q3)** There is a clear relationship between metamorphic facies and geothermal gradient. A, B and C in the following figure are represent geothermal gradient for different metamorphic events. Complete the following table using the terms between brackets: **“6 mark”**

| *Line* | *Geothermal gradient (Normal, High, Low)* | *Geological event (Subduction, Contact metamorphism, Regional metamorphism)* |
|---|---|---|
| *A* | | |
| *B* | | |
| *C* | | |




**Q4)**

1- what’s the difference between blastoporphyritic texture and porphyroblastic texture? **“4 mark”**

**2-** Define the following **“9 mark”**

Mineral assemblage, Recrystallization, Skarn:

**Q5)** Write about metamorphic zone and count mineralogical zone **“10 mark”**