G278 MINERALOGY AND GEMMOLOGY

17TH OCTOBER 2007 - REVISED 2007 EXAM ADVICE

Affected Section - Part 3 Format – Make sure you know how to answer all these questions!!!

Discuss the mineralogical and textural characteristics of cyclic units in layered intrusions. How can changes in the composition of plagioclase and olivine be explained using binary phase diagrams?

What are cyclic units and what rock types are associated with them? Give an explanation as to how cyclic units form and discuss changes in the composition of plagioclase with time. Use sketches to illustrate your answer

Discuss the mineralogical and textural characteristics of one cyclic unit in the Bushveld Complex from the bottom to the top. How can changes in the composition of plagioclase and olivine be explained using binary phase diagrams?

Discuss the formation and mineralogical characteristics of cyclic units in layered igneous intrusions. Why are complete cyclic units not always preserved and how can you tell that the cyclic unit is not complete?

Explain the differences in mineralogy and texture that you might see between a fresh mid-ocean ridge basalt and one that has undergone hydrothermal alteration and list some processes that might account for these changes.

Compare and contrast the structure of the ocean crust and that of ophiolites. Use sketches to illustrate your answer

Discuss the structure of the ocean crust. What are the different rock types involved and what are their mineralogical and textural characteristics and the thickness of different units. Illustrate your answer with an appropriate diagram.

Discuss the structure of the ocean crust. What are the different rock types involved, what is their mineralogy and what are their physical characteristics and thicknesses? Illustrate your answer with an appropriate diagram.

Discuss the types of rock products and their magma compositions formed by volcanic eruptions and the relationship between magma composition and eruption style. What components are used in the IUGS classification of pyroclastic rocks?

Summarise the differences between stratovolcanoes and shield volcanoes, making particular reference to eruption style and magma composition. What is the relationship between magma composition and mineral assemblage?

Compare and contrast the different characteristics of strato-volcanoes and shield volcanoes. How does the composition of the magma differ between the two and how does this influence eruption style?

Discuss the difference between granites and rhyolites in terms of their mineralogy and texture. How would these differences influence the behaviour of the rocks during metamorphism?

Discuss the differences between isograds, zones and facies as they apply to metamorphic petrology. Give examples of all three and illustrate your answer with appropriate diagrams relevant to the pelite system.

Discuss the mineralogical and textural differences that you would expect to see during prograde metamorphism from greenschist through to granulite facies of a basaltic rock as compared to a pelitic rock.

Discuss the mineralogical and textural differences that you would expect to see as a result of contact metamorphism as compared to regional metamorphism. Give specific examples and diagrams to illustrate your answer.

Define the phase rule and explain how it can be used to explain the texture and mineral assemblage of igneous and metamorphic rocks. Give specific examples and diagrams to illustrate your answer.

How is the mineralogy and texture of granulites different to that of lower grade rocks? Discuss processes that might account for these differences.

Discuss the petrological interpretation of blueschist and eclogite facies rocks. What problems are there with determining the equilibrium assemblage and how does this impact on P-T calculations?

Discuss the mineralogical changes that you would see in a basalt that underwent blueschist and eclogite facies metamorphism. What influence might early seafloor alteration have on the mineralogical and textural development of the rocks?

Bespreek die mineralogiese en teksturele karakteristieke van sikliese eenhede in gelaagde intrusies. Hoe kan veranderinge in die samestelling van plagioklaas en olivien verduidelik word deur gebruik te maak van binêre fase diagramme?

Bespreek die mineralogiese en teksturele eienskappe van een sikliese eenheid in die Bosveld Kompleks van basis tot bo. Hoe kan veranderings in die samestelling van plagioklaas en olivien verduidelik word met gebruik van binêre fase diagramme?

Bespreek die totstandkoming en mineralogiese eienskappe van sikliese eenhede in gelaagde stollingsintrusies. Waarom is volle sikliese eenhede nie altyd gepreserveer nie en hoe sal jy weet dat die sikliese eenheid nie voltooi is nie?

Bespreek die struktuur van die oseaankors. Watter verskillende rotstipes kom voor, wat is die mineralogie, fisiese karakteristieke en diktes van die tipes? Illustreer jou antwoord met ’n toepaslike diagram.

Verduidelik die mineralogiese en tekstuur verskille wat u mag waarneem tussen ’n vars middel-oseaanrug basalt en een wat hidrotermale verandering ondergaan het. Lys ‘n paar prosesse wat hierdie veranderinge verklaar.

Bespreek die struktuur van die oseaankors. Watter verskillende gesteente-tipes kom voor en wat is hul mineralogiese en teksturele eienskappe en die dikte van verskillende eenhede? Illustreer u antwoord met ‘n gepaste diagram.

Bespreek die tipes gesteenteprodukte en hul magma samestelling gevorm tydens ’n vulkaniese erupsie. Bespreek ook die verhouding tussen magma samestelling en erupsie styl. Watter komponente is in die IUGS-klassifikasie vir piroklastiese gesteentes gebruik?

Bespreek die verskille tussen graniete en rioliete in terme van hul mineralogie en tekstuur. Hoe sal hierdie verskille die gesteentes tydens metamorfisme beïnvloed?

Maak ‘n opsomming van die verskille tussen stratovulkane en skildvulkane en verwys veral na uitbarstingstyl en magma samestelling. Wat is die verhouding tussen magma samestelling and mineraal samestelling?

Bespreek die mineralogiese en teksturele verskille wat u sou verwag as gevolg van kontak metamorfisme vergeleke met regionale metamorfose. Gee spesifieke voorbeelde en diagramme om u antwoord te illustreer.

Bespreek die verskil tussen isograde, sones en fasies soos dit van toepassing is op metamorfe petrologie. Gee voorbeelde van al drie en illustreer u antwoord met diagramme van toepassing op die pelitiese sisteem.

Defineer die fasereël en verduidelik hoe dit gebruik kan word om die tekstuur en mineraal samestelling van stollings en metamorfe gesteentes te verduidelik. Gee spesifieke voorbeelde en diagramme om u antwoord te illustreer.

Bespreek die mineralogiese en teksturele verskille wat u sou verwag tydens prograad metamorfisme van groenskis tot granulietfasies, van ’n basaltiese gesteente en vergelyk dit met ’n pelitiese gesteente.

Hoe verskil die mineralogie en tekstuur van granuliete van dié van laer graad gesteentes? Bespreek prosesse wat verantwoordelik mag wees vir hierdie verskille.

Defineër die fasereël en verduidelik hoe dit gebruik kan word om die tekstuur en mineraal samestelling van stollings en metamorfe gesteentes te verduidelik. Gee spesifieke voorbeelde en diagramme om u antwoord te illustreer.
Bespreek die petrologiese interpretasie van blouskis en eklogiet-fasies gesteentes. Watter probleme is daar met die bepaling van die ekwilibrium samestelling en hoe affekteer dit die P-T berekeninge?

Wat is sikliese eenhede en watter rotstipes word daarmee geassosieër? Gee 'n verklaring hoe sikliese eenhede vorm en bespreek veranderinge in die samestelling van plagioklaas met tyd. Gebruik sketse om jou antwoord te illustreer.

Vergelyk en kontrasteer die struktuur van die oseaankors en dié van ofioliete. Gebruik sketse om jou antwoord te illustreer.

Vergelyk en kontrasteer die verskillende karakteristieke van strato-vulkane en skildvulkane. Hoe verskil die samestelling van die magma van die twee tipes, en hoe beïnvloed dit die uitbarstingsstyl?

Bespreek die mineralogiese veranderinge wat jy in 'n basalt sal kan sien wat blouskis en eklogiet fasies metamorfisme ondergaan het. Watter invloed mag vroeë seevloer alterasie op die mineralogiese en teksturele ontwikkeling van die gesteentes hê?