

**Question 1 (20 Marks)**

- 1) List 2 minerals with their chemical formulae that are typical of a rock ‘**Eclogite**’ (4marks).

Minerals names	Minerals formulae
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- 2) List 3 possible minerals with their chemical formulae that are typical of a rock ‘**blueschist**’ (6 marks)

Minerals names	Minerals formulae
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- 3) List 1 silicate mineral with its chemical formulae that is typical of a ‘**granulite**’ rock of pelitic composition (2 marks)

Minerals names	Minerals formulae
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- 4) List 1 silicate mineral with its chemical formulae that is typical of contact metamorphic rocks of pelitic composition (2 marks)

Minerals names	Minerals formulae
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- 5) List 2 typical minerals of an amphibolite (4 marks)  
6) List 1 typical mineral of a mafic rock metamorphosed under greenschist facies (2 marks)

**Question 2 (30 marks)**

Based on the mineral composition and textures of the four different metamorphic rocks numbered from 1 to 4 in the table below:

<b>Mineralogy</b>	<b>Texture</b>
<b>Rock 1</b> 30% glaucophane, 20% lawsonite, 20% garnet and 30% albite.	A bleu rock with medium grained texture and light foliation marked by the alignment of glaucophane minerals.
<b>Rock 2</b>	Very fine grained texture with some large crystals of andalusite. No foliation is observed.

30% andalusite, 10% garnet, 20% quartz, 20% biotite and 20% plagioclase	
<b>Rock 3</b> 30% Hornblende, 20% Garnet 5% Quartz and 5% opaques, 30% Plagioclase,	Coarse grained texture with no foliation
<b>Rock 4</b> 20% Staurolite, 10% Muscovite and 20% Biotite, 20% garnet, 30% Quartz	medium grained texture with staurolite porphyroblasts and strong foliation marked by the alignment of micas.

**Question 3 (30 marks):** Give the definition of the following terms and illustrate with sketches or examples when possible:

- a) Isograd
- b) Paragenese
- c) Poikiloblast,
- d) Pseudomorph
- e) Geothermal gradient
- f) Index Minera

**Question 4 (20 marks)**

What is the difference between shock metamorphism and contact metamorphism?  
Discuss and illustrate with examples from South Africa