



**Benha university**  
**Faculty of science**  
**Geology Dept.**  
**21/5/2019**

**Third Level**  
**Special Geology**  
**The Basement rocks of Egypt (336 G)**  
**Time: Two Hours**

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**Examination of The Basement rocks of Egypt (336 G) for the  
Third level students (Special Geology), June 2019.**

**Answer three questions only from the following.**

1- Explain the ophiolitic sequence of Wadi Ghadir? (16 marks)

The ophiolitic sequence of Wadi Ghadir consists from base to top serpentized peridotites, a gabbro complex, sheeted dykes and pillowed basalt. A thin unit of deeper water sediments composed mainly of cherts and carbonates caps the pillow basalts in several places. The ophiolites occur as allochthonous unit in a mélangé assemblages. The serpentized peridotite form either a huge allochthonous mountain-sized masses or boulders in the mélangé. The largest body is composed of leherzolite at the base and cumulate dunite and harzburgite at the top. Boudinage chromite lenses form a zone separating the two peridotite. The serpentinites are transformed into talc-carbonate rocks in many places.

The gabbro complex is distinctly layered at the bottom and grades upward into coarse-grained rosette gabbro and then micro gabbro. Pockets of pegmatitic gabbro, pyroxenite cumulate, anorthosites and trondjemite are common in layered gabbro.

The sheeted dykes is formed of a series of diabase dykes in contact with each other without any foreign wall rock material.

The pillowed lava basalts are associated with the sheeted dykes they form a mass reaching 200m thickness. Individual pillows are circular or oval in shape and range in size from 20cm to 1.5m.

The mélangé is a mapable rock unit characterized by the inclusion of fragments and blocks, both are exotic and native, of all sizes, which may reach several kilometers, embedded in fragmented and generally sheared matrix.

2- According the classification of the Egyptian granites proposed by Hussein et al. (1982).

What is the characters of G<sub>1</sub> granites?

(16 marks)

<b>G1</b>
All fall in the calc-alkaline field
Associated with island arc andesites.
Formed under compressional environment
I-type magnetite series granites
Form large intrusions
Range from diorite to granites in composition
Hornblende is always dominant over biotite
Muscovite is not recorded
Don not contain cordierite, garnet, andalusite or silliminite but contain allanite and sphene
SiO <sub>2</sub> content dominantly range from 65% or less
Molecular Al <sub>2</sub> O <sub>3</sub> / (nao+K <sub>2</sub> O+cao) is less than 1.1.
Na <sub>2</sub> O content is usually higher than 3.2%.
Most of them have normative diopside; otherwise, they show less than 1% corundum.
<sup>87</sup> Sr/ <sup>86</sup> Sr are in range of 0.702-0.706
Nb content is very low, less than 10ppm
REE content is less than 50 ppm

3- What is the differences between old and young metavolcanics according to Stern

classification (1981)?

(16 marks)

<b>OMV</b>	<b>YMV</b>
Form thick mountainous of pillowed metabasalts.	Form moderately hills
The sediments interbeds are very rare	Pillow structure is nearly absent
Essentially composed of metabasalts	Mainly meta andesites
Always associated with metagabbros and serpentinites	Associated with metasediments with no genetic relation with ophiolitic metagabbros and serpentinites.
Absence of pyroclastic sediments	Associated with abundant volcanogenic metasediments
Highly deformed and metamorphosed	Less deformed and metamorphosed

Represents parts of ophiolitic assemblages.	Considered to have been evolved in an island arc tectonic setting.
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4- Discuss the general features of Migif-Hafafit gneisses? (16 marks)

The Migif-Hafafit gneisses were subdivided into six lithological units from top to bottom these are:

1. Hornblende gneisses
2. Biotite gneisses and schist
3. Psammitic gneisses
4. Biotite gneiss with intercalation of hornblende gneisses.
5. Hornblende gneisses
6. Granitic gneisses.

**Good Luck**

المستوى الرابع (جيولوجيا-جيوكيميا-جيوفيزياء)  
المادة : الجيولوجيا الاقتصادية  
التاريخ: 2016/6/1  
الزمن : ساعتان

جامعة بنها  
كلية العلوم  
قسم الجيولوجيا

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امتحان المستوى الرابع علوم – جيولوجيا (جميع الشعب) في مادة الجيولوجيا الاقتصادية

– الفصل الدراسي الثاني دور يونيو 2016.

أجب عن ثلاثة أسئلة فقط مما يأتي؟

- س1: اشرح بالتفصيل وسائل وعمليات تركيز الخامات في الطبيعة بالعمليات التالية:  
أ. التركيز بالتنوع المجماتي عند التبلور.  
ب. التركيز بعمليات التحول.
- س2: تكلم عن الرواسب المجماتية المبكرة بنوعيتها حسب تقسيم باتمان؟
- س3: تمكن العالم ليندجرن من تحديد ثلاثة نطاقات من الرواسب المعدنية للمحالييل المائية الساخنة. ناقش هذه النطاقات بالتفصيل؟
- س4: ناقش رواسب الخامات بالطرق الآتية:-  
أ. رواسب المراقذ النهرية  
ب. رواسب المراقذ الشاطئية
- س5: تكلم عن الخامات التالية (طرق تكوينها – تواجدها – اقتصاديتها)  
أ. رواسب الفوسفات البحرية  
ب. رواسب اليورانيوم الرسوبي  
ج. رواسب التلك وحجر الصابون

بالتوفيق