

**Benha University
Faculty of Science
Geology Department
4th year Geology**



**Geology of Egypt (415G)
Final Ex. (48 marks)
Time Two Hours
Date: 15-5-2019**

Answer

Paleozoic Era

Answer the following questions:

- I- During Paleozoic Caldenonian Orogny affecting the Paleozoic sediments. Discuss in brief (15 marks).**

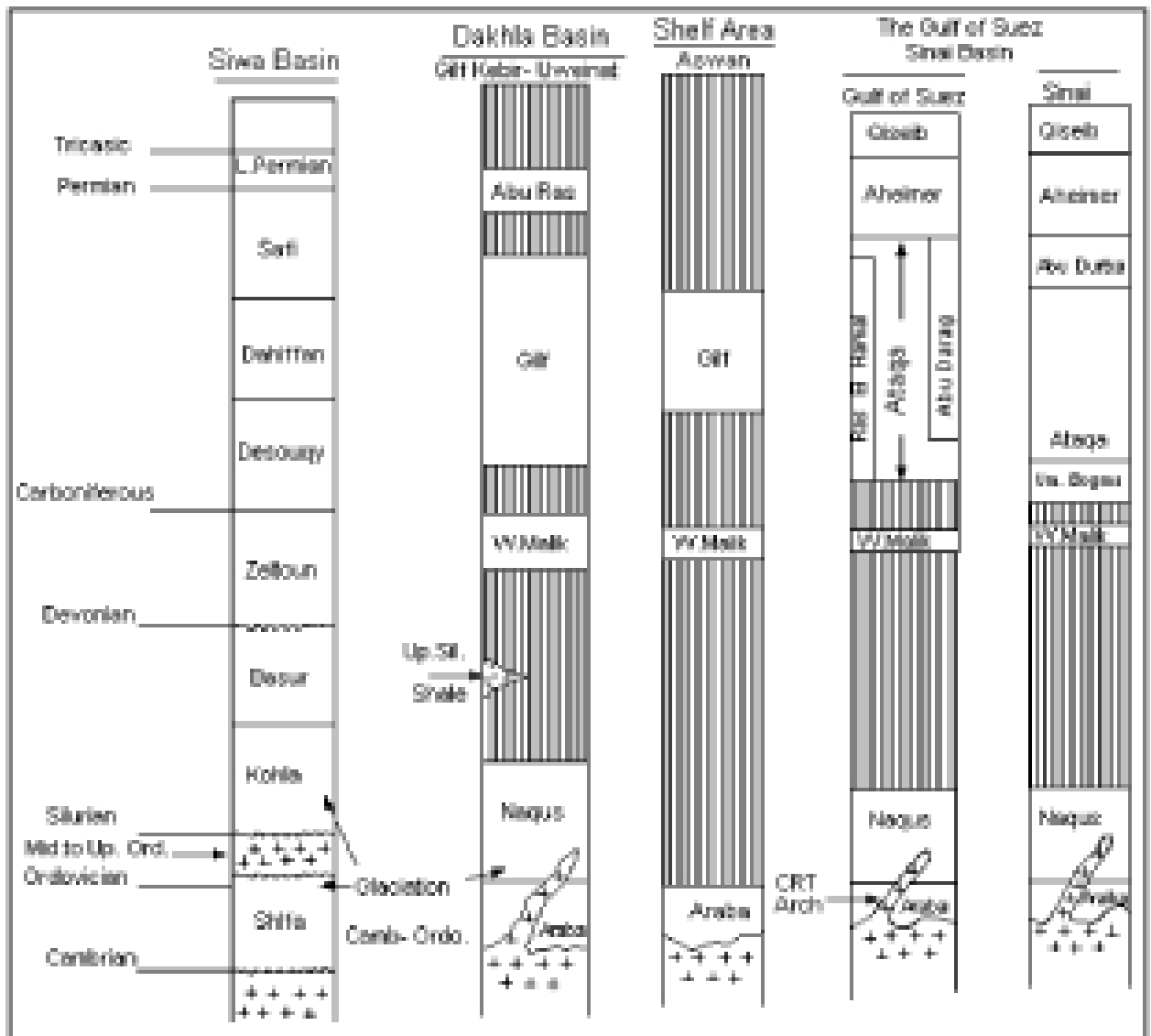


Table 2 . Paleozoic Units in Different Parts of Egypt

Mesozoic Era

II- Discuss the change in facies from the north to the south during the Early Cretaceous in Sinai..... (4 marks).

<u>North Sinai</u>	<u>Central Sinai</u>	<u>Southern Sinai</u>
The Risan Aneiza Fm.	Malha Fm.	Malha Fm.
Malha Fm.		

III- Write briefly on the exposed marine Triassic rocks in Egypt (4 marks).

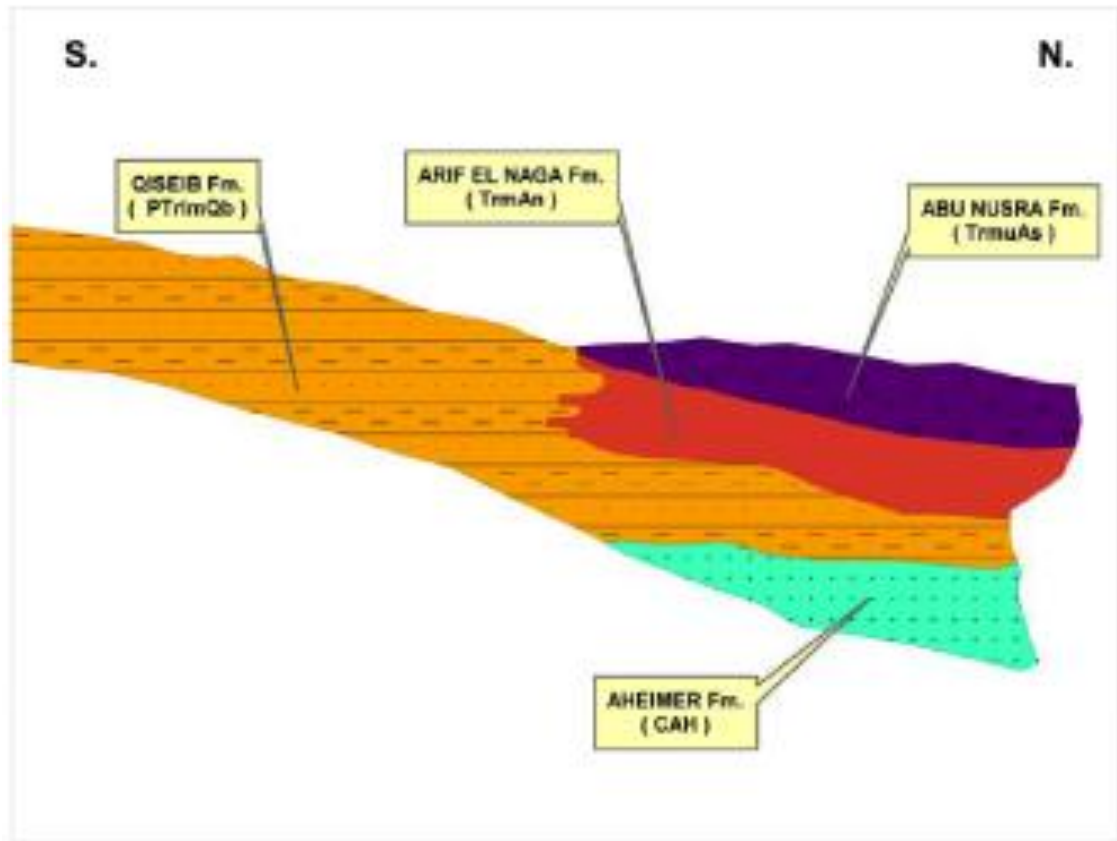


Fig. 23. S- N. Change of facies within Triassic sediments in Sinai

Table 4 - Correlation between different Triassic units in Sinai

	<p>Awad, (1946), Geological Survey of Egypt (1982)</p> <p>Massive series of hard limestones and dolomites with interbedded gypsaceous clays and marls, poorly fossiliferous in the lower part, devoid of fossils in the upper part.</p>	<p>Said (1971), Druckman (1974), Jenkins (1990)</p> <p>Arif El Naga "C": The main marine transgression during the Triassic, carbonates identified in Ayun Musa-2 (69 m), Hamra-1 (100 m), Abu Hamath (38 m), Nekhl (35 m) and Halal-1 (275 m) wells. This unit is 116 m at Arif El Naga made of biomictites, biosparites and shales, grading upward into biomictites, micrites, dolomictites, algal stromatolites and dolomitic shales with flat pebble conglomerates.</p> <p>The Mohilla Formation described by Jenkins from Halal-1 well as 50 m dolomitic limestones, shales and anhydrite may be coeval with the top Triassic unit described by Awad.</p>	<p>Present Study</p> <p>Abu Nusra Formation (Allam and Khalil 1988).</p>
	<p>Muschelkalk</p> <p>Very highly fossiliferous Muschelkalk: Lunachells in a gypsaceous sandy or marly matrix including <i>Ceratites</i> spp. and other fossils at the top of the unit and <i>Beneckia</i> sp. at its base.....20 m</p>	<p>Arif El Naga "B": Argillaceous micrites, biomictites and biosparites: <i>Beneckia</i> - bearing beds.....19 m</p>	<p>Arif El Naga Formation (Said 1971).</p>
	<p>Anisian</p> <p>Varicoloured sandstones, medium-grained.....50m</p>	<p>Arif El Naga "A": Multicoloured, fine to medium-grained, well-cemented sandstones, variegated siltstones and shales carrying plant remains.....50 m</p>	<p>Qiscib Formation (Abdallah <i>et al.</i> 1963).</p>
<p>Upper Carboniferous - Lower Permian</p>	<p>Drilling near the core of Arif El Naga dome by the Geological Survey of Egypt reached the basement at 44.75 m depth from the surface, mostly sandstones but fine clastics are not uncommon.</p>		<p>Abcimer Formation (Abdallah and Adindani 1963)</p>

IV- With drawing compare between the Jurassic rock units in Sinai and on the western side of the Gulf of Suez..... (4 marks).

Table 5 - Correlation between different Jurassic units in Egypt

Toarcian		Bajocian	Bathonian	Bathonian-Kimmeridgian
Mashabba	Rajabia	Bir - Maghara	Safa	Masajid
100m Sa, Ls and clay, plant remains at base, quartz conglomerate, bed (20cm) on top of the plant bed. Sa is cross bedded, ripple marked, the Ls is marly, contains with mollusc fossils. Rhythmic sedimentation is obvious; alternation of quartzitic sandstone, fluvial to deltaic Sa, & clays within the fossiliferous marls nearly Ls.	200 m thick Ls, clay and rare Sa rich in corals and algae.	220m sandstone, clay and minor Ls, the Sa is gritty, cross bedded, ripple marked and concretionary, plant remains are common with rare ammonite fossils in the Ls. Cyclical sedimentation is well observed in the formation, including coal seams.	215m carbonaceous banded silty sandstones with a few thin shaly interbeds, including the economic coal beds of Gebel Maghara. Rich in marine and floral fossils and spores especially in the 11 coal seams.	<ul style="list-style-type: none"> Ayasrah Mb, 400m Ls, minor clay bands Ls is silty calcareous with rich oyster beds. Kohalla Mb, 130m glauconitic marly Ls partly coralline and partly silty with clay, and sandstone beds, fossiliferous.
		Lower Jurassic Sa and shales have been drilled in Wadi El Natrun and Abu Hamir. Early to Middle Jurassic in Ayen Marsa & Sierris wells		The southern Rajabia Fm and the Amr Fm to its southwest at the eastern side of the Gulf of Suez are 40 to 100m thick. The units are uncolored sequence of grits, sandstone and quartz pebbles sand. The southern Rajabia unconformably overlies Paleozoic rocks, whereas the Amr at Wadi Barta is underlain by the Triassic Olsab Fm. The general dip is eastward which probably puts the Amr on top of the Rajabia.
		Upper Rhyzocornelia Bed: 0.5m marly fossiliferous Ls with marl bands, shales & Sa, siliceous Ls bed at top highly fossiliferous.	40m, mudcracked sandy & calcareous marl, shale & Sa, including plant remains.	
		10m ferruginous Sa, sandy shale, marl, the Sa is false bedded including badly preserved fossils.		
				Upper Jurassic sandstone were drilled in the Marsa, Goker, Hald, Ayun Marsa, Hamra & Karb El Bahazin
Bahreïn	Wadi El Natrun	Khatafba	Masajid	
551m fine to coarse quartzose sandstone with thin pebbles interbeds, siliceous, shale and argillitic.	500m, dol and dol Ls, shale and argillitic; Early to Middle Jurassic age of the unit based on the presence of palynomorph assemblage. Probably equated with the Rajabia Formation.	1200-1375m Sa and shale, with a few fine grained siltstone and thin coal seams. The clastics are covered with the Shabwa Formation whereas the carbonates are equivalent to the Mahi Mb. Of the Bir Maghara formation. The Khatafba is Toarcian to Early Bajocian in age.		450-400m dol. Ls, marl dominated these shale beds. The carbonates carry oyster beds, fossiliferous-the members suggested as Oxfordian-Kimmeridgian and possibly Bathonian to Callovian ages for the lower beds.

V- Write on the economic aspects of the Upper Cretaceous deposits of Egypt..... (3 marks).

Economic aspects of the Upper Cretaceous deposits of Egypt:

- 1- The Cretaceous sediments are important source and reservoir rocks for oil and gas in the Gulf of Suez and the north Western Desert petroliferous provinces.**
- 2- phosphates are produced from the Duwi Formation in the Nile Valley, Abu Tartur Plateau and in the Qusier-Safaga district.**
- 3- Aswan oolitic iron ores were once exploited from the Cretaceous clastics NE of Aswan (Timsah Fm.).**
- 4- Cretaceous carbonates are quarried and used in several industries. They are used as buildingstones and are also crushed and used as a sub-base in asphaltic roads.**

Prof. ڤRefaat Osman

Prof. Gamal El Qot