



106 / 110

Engineering Geology – Mid Term Exam, Date: Tuesday 8<sup>th</sup> Nov. 2015

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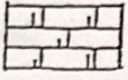
Instructors (Eng. Saheem Murshid)

Dr. Taleb Al-Harithi

Section : (1 , 2 , 3 , (4))

Question #1 / Fill the spaces: (30 Marks) 30

- 1- potholes are circular holes in the floor of the stream channel formed by abrasion effect.
- 2- Economic Geology is a branch of geological sciences that studies valuable earth geo-resources.
- 3- Asthenosphere is the most upper & elastic layer of the Earths' mantle that is located at the depths between 100-700kms.
- 4- Example of constructional Earth activities that lead to the creation/addition of new matter to the Earths' crust is: volcanism
- 5- Gradual cooling of magma deep under Earths' surface gives rise to the formation of rocks known as intrusive igneous rocks with coarse-grain texture.
- 6- calcite is an example of a mineral composed of 1 (one) element.   
that form limestone (mineral element Ca)
- 7- orthoclase is the mineral which hardness equals 6.
- 8- Talc is the mineral which has a soapy touch and used abundantly in many cosmetic industries.
- 9- Bauxite soil is the type of soil rich in Aluminum oxides and considered as ore for Al.

- 10- The last to crystallize from the Earth's melt [magma/lava] is  
 ..... quartz .....
- 11- Accumulation of fines in the soil horizon (B) forming a dense impermeable layer  
 called ..... hard layer .....
- 12- The size of the pebble is ..... 4 - 64 mm .....
- 13- This rock notification  refers to the rock called ..... limestone (لب الحجر) .....
- 14- Most of the houses in Palestine are made up of local rock named ..... limestone .....
- 15- Bed load of rocks and minerals fragments is carried by the stream current in 3  
 ways; they are, a: ..... rolling ..... b: ..... sliding .....  
 c: ..... solifluction .....
- 16- The upper limit (surface) of the saturated zone is known as ..... water table .....
- 17- Impermeable rocky layer is known as ..... aquiclude .....; one example is the  
 rock type ..... shale .....
- 18- Environmental problems associated with groundwater are many, name 3 of  
 them: a. ground water is unfeasible (المياه الجوفية غير متوفرة) ..... b. ground subsidence (انخفاض الارض) .....  
 c. salt water contamination (تلوث المياه المالحة) .....
- 19- The most important Earth's wearing agent is ..... running water .....
- 20- The abbreviation (ppm) to measure water quality means ..... part per million .....
- 21- When water table cuts topography we have ..... spring .....
- 22- The river discharge is measured as follows:  
 ..... cross Area (m<sup>2</sup>) x velocity (m/s) of the river .....
- 23- When the water table is higher than the water level in the stream, the stream is  
 called ..... effluent .....
- \*24- The rise in the groundwater level in a dug well is called ..... flow well (آبار جريان) .....

96

Rock or Mineral	MINERAL STRUCTURE				IGNEOUS TEXTURE			METAMORPHIC TEXTURE		SEDIMENTARY		
	Single Chain	Single Tetrahedron	3-D	Sheet	Phaneritic <small>Crystals</small>	Aphanitic <small>fine</small>	Porphyritic	Foliated	Non-foliated	Detritus	Organic	Inorganic
1. Gneiss								<input checked="" type="checkbox"/>				
2. Blotite												
3. Stalactite (مرايط)												<input checked="" type="checkbox"/>
4. Breccia										<input checked="" type="checkbox"/>		
5. Schist												
6. Gabbro					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>						
7. Graywack										<input checked="" type="checkbox"/>		
8. Quartz				<input checked="" type="checkbox"/>								
9. Halite = Rock salt beds												<input checked="" type="checkbox"/>
10. Coquina											<input checked="" type="checkbox"/>	
11. Andesite												
12. Basalt						<input checked="" type="checkbox"/>						
13. Olivine												
14. Quartzite	<input checked="" type="checkbox"/>								<input checked="" type="checkbox"/>			
15. Granite					<input checked="" type="checkbox"/>							

3

30

(30 Marks)

Question (3)

Match between those in column (1) with those in column (2) in the table below:

COLUMN (1)	COLUMN (2)
1- Finest detrital rock	(1) Corundum (15)
✓ 2. Weathered rock and mineral fragments	(4) Gypsum
✓ 3. Found hanged in underground caves' ceilings	(13) Gneiss
✓ 4. Evaporate mineral	(11) Pyroclastic
✓ 5. Gives granite its rose color	(6) Quartz
✓ 6. Made up totally of SiO <sub>2</sub>	(8) Gold
✓ 7. Metamorphism around the volcano neck	(9) Fossil
✓ 8. Found as placer deposit	(3) Stalactite
✓ 9. Any indicator for prehistoric life	(5) Orthoclase *
✓ 10. Light coarse sandstone	(2) Regolith
✓ 11. Lava mixed with rock fragments	(10) Arkose
✓ 12. Inclination of strata in sedimentary rock	(14) Diorite *
✓ 13. Rock formed due to high grade metamorphism	(1) Clay
✓ 14. Coarse grained igneous rock	(7) Contact
✓ 15. Has a hardness "9"	(12) Dip

20

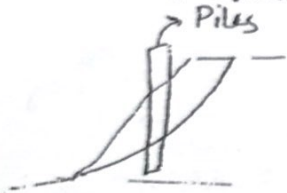
Question #4

(20 Marks)

a) Explain how dolomite is formed?

الدولوميت هو  $CaMg(CO_3)_2$  فهو يتكون من مجموعة كربونات وصه كالسيوم ومغنيسيوم، ويتكون المغنيسيوم بالترسيب  
 1- ترسيب مباشر للمغنيسيوم مع الكالسيوم و  $CO_2$  Direct precipitation  
 2- حل المغنيسيوم مكانه الكالسيوم (اللاخلد) وكما ج ذلك  
 ان وقت طويل فلذلك طبعه اسم الصخر القديم على Dolomite ancient rock وتفاعلات

b) Explain how piles can be used to control mass wasting?



يتم استخدام الكوازيم حتى تصل الى عمق أكبر من الطبقة للفكك او الالتهاب فتعمل على دعم الصخر ولا تتساقط بذلك الكتل انه تتحرك لانه هناك عائق يمنعها من النزول الى اسفل وبالتالي تقلل من Mass Wasting

c) Explain how the alluvial fans are formed in nature?



يكون للماء مسير في مار معين Channalized flow في قناة ويكون لها عرضها معين ولكن اذا فرغت الماء من هذه القناة الى منطقة واسعة <sup>مثل جبل</sup> تتشكل مقاطع و فانه سرعتها تنجح من وترسيب جميع القطع المحمولة ويتشكل Bottomest layer وتكون طبقة اقلية من clay + silt على صدر جبل النجر و Forest layer تكون مائله و Topest layer بحيث تكون طبقات رقيقة

d) Explain in brief how sorting is affected by the current velocity?

التيار الماء يحمل قطع مختلفة الاحجام ويظهر بناء على capitanse اي المقربة والتي يتناسب طردياً مع مربع السرعة وعندما تقل السرعة تدريجياً ترتب القطر التي تحمل غير قادر، كما يتركها وهكذا فهي تقوم بعمل sorting للقطع، مثلاً كانت سرعتها بالاول 9 m/s تحمل احجار max size 50mm وقلتها السرعة الى 4 m/s تحمل احجار max size 40mm فترتب القطر التي هي أكبر من 40mm