


9

صوبه لوديا

	<b>TANTA UNIVERSITY</b> <b>FACULTY OF SCIENCE</b> <b>DEPARTMENT OF GEOLOGY</b>		
	<b>FINAL EXAMINATION for level 4 (Geology) Students</b>		
	<b>COURSE TITLE:</b>	<b>Isotope Geology</b>	<b>COURSE CODE: GE4121</b>
<b>DATE:</b>	JAN., 2015	<b>TOTAL ASSESSMENT MARKS: 100</b>	<b>TIME ALLOWED:</b> 2 HOURS

1- Answer the following questions

( 36 marks)

1-Discuss how can determine the ages of:

- a) deposition of sedimentary rocks,
- b) determine the age of metamorphism,
- c) fresh younger alkali feldspar granites,
- d) shear and fault zone,
- e) age of older rocks,
- f) age of fossils.

2- Compare between the advantages of U-Pb and K- Ar method for dating

3- What is the difference between isochron, errochron, Concordia, Discordia

4- Discuss the applications of oxygen and Hydrogen isotopes in igneous rocks, stratigraphy and ore deposits.

5- Explain the epsilon Nd, initial Nd, epsilon Sr, initial Sr ratios in basic and acidic igneous rocks

6- What is the different analytical techniques used for dating zircon

2- Put  $\checkmark$  or  $\times$  marks and correct the wrong ones:-

( 39 marks)

1- U- Pb method used for dating unmetamorphosed sedimenatry rocks containing Rb- Bearing minerals such as glauconite, clay minerals and K- feldspar

2- The half life time of Sm is very short

3- The Sm- Nd method is useful for dating terrestrial rocks, stony meteorites and lunar rocks

4- The volcanic rocks in continental margin have low  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios

5- U- Pb method used minerals such as biotite, alkali feldspar and hornblende

6- K- Ar method is applicable for certain K- bearing minerals and rocks. It includes biotite, muscovite and hornblende.

7- Depltd mantle (DM) is characterized by very low  $^{143}\text{Nd}/^{144}\text{Nd}$  ratios and high  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios.

8- Lu- Hf method is useful for dating basic rocks

9- Isobars are elements have the same atomic number and different in atomic mass

10- negative epsilon Nd indicate crustal origin

11- CP measures the isotopic ratios and determines the age.

12- Initial ratios is the measured ratios by instruments such as SHRIMP or Finnigan Mat 262 mass spectrometer

13- Stable isotope stratigraphy depends on Osmium and sulfur isotopes

من فضلك انظر حلقه



3- Complete the followings:

(25 Marks)

- 1- The absolute age determination depends on .....
- 2- Nd model age is the age .....
- 3- The granites have .....  $^{18}\text{O}$  oxygen isotopes whereas contain initial  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios between ..... and .....
- 4- SMOW is the standard used for ..... and ..... isotopes.
- 5- Sandstones contain high  $^{18}\text{O}$  isotopes due to presence of some minerals such as .....
- 7- SHRIMP is used for measured the..... isotopes in some minerals such as..... whereas the LA-abilitation ICP used for measure the .....
- 8- Uranium- Lead system has a .....half life time and used for determine the ..... age of rocks, whereas the K- Ar system have .... ..half life and used for .....
- 9- U- Pb system decays ..... whereas K- Ar decays.....
- 10- ..... isotopes is used for measure heat of formation whereas the .....is used for measure the crystallization age.

Examiners:

<i>Prof. Mohamed F Ghoneim</i>	<i>Prof Mohamed M Abu Anbar</i>
<i>Prof Hassan Harraz</i>	<i>Dr Ismael AbdelRasol</i>

*Good Luck*



