دور يناير ٢٠١٢		المستوى : الثالث
الزمن: ساعتين		الشعبة: جيوفيزياء
التاريخ :	كلية العلوم – قسم الرياضيات	المادة : تحليل عددى

Answer the following question

[1] Consider the equation $x^3 - x - 1 = 0$ in the interval [1,2].

    a) Show that the equation has a root in the interval.

    b) Find the number of iterations required to achieve the root accurate to 10^{-5} using the bisection method.

    c) Find this root within an accuracy of $0(10^{-3})$ using this method.

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[2] Consider the equation $x^3 + 4x^2 - 10 = 0$ in [1,2]. Solve this equation using the fixed point method using

    i) $g(x) = x - x^3 - 4x^2 + 10,$ ii) $g(x) = x - \dfrac{x^3 + 4x^2 - 10}{3x^2 + 8x}.$

    Perform only five iterations. Comment on your results.

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[3] i) Calculate the third – degree Taylor polynomial about :

    $x_0 = 0$ for $f(x) = (1 + x)^{1/2}.$

    Find the polynomial to approximate $\sqrt{1.1}$ and $\displaystyle\int_0^1 (1 + x)^{1/2}\,dx.$

    ii) Using the nodes $x_0 = 2,\ x_1 = 2.5$ and $x_2 = 4$ to find the second degree interpolation for $f(x) = \dfrac{1}{x}.$

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[4] The table below shows the values of f(x) versus x

X	f(x)
1.0	0.765
1.3	0.620
1.6	0.455
1.9	0.282
2.2	0.110

   i)   Use the forward difference approximation for the function f(x).

   ii)   Obtain f'(x) at 1.0, 1.3, 1.9, using 3- point and 5- point divided finite differences.

د/ سامية ابو عوض   مع الأمنيات بالنجاح والتوفيق

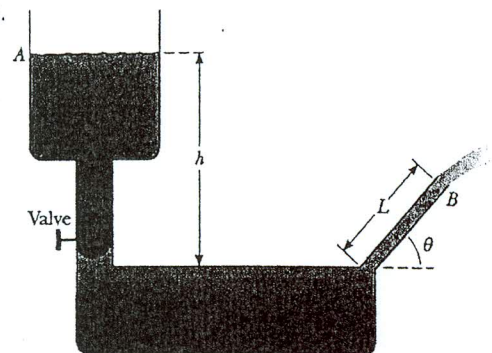| Mansoura University Faculty of Science Physics Department Subject: Physics		First Term third Year :Geo-Physics Date : Jan 2012 Time allowed : 2 hours
Course (s): Elasticity & Fluid Mechanics **phy332**		Full Mark:: 60Mark

Answer THE FOLLOWING Questions Only: Each Questions (15) Mark

[1] a-Prove that the internal work done stored in an object as elastic potential energy during deformation is equal to half (1/2) the work done by the external force causing the deformation.. **[8] Mark**

b-If Young's modulus of a material is twice the Bulk's modulus (Y = 2 B). Determine the transverse strain of this material when it is subjected to a longitudinal strain of 3×10^{-3}
This is the only information you need to solve this problem. **[7] Mark**

[2] a- Define the following terms: i – Fracture toughness . ii – elastic energy of a rod . iii- Fracture strength . iv – Velocity profile in a pipe. V – Ideal fluid. Vi - Irrotational flow **[6]Mark**

b- A steel bar has a length of 1.5 m and width of 100 mm and thickness of 50 mm. If an axial force of 80 KN is applied to the bar, determine the change in its length and the change in the dimension of its cross-section. Take Y_{steel} = 200 G Pa and υ_{steel} = 0.3. **[9] Mark**

[3] a- Calculate the strain energy stored in a bar if the load is placed in contact with the collar without impact and suddenly released. **[7] Mark**

b- Two sheets of an alloy, each having different heat treatment. Material (1) has yield strength σ_y = 860 MPa and K_{1c} = 98.5 MPa $\sqrt{m}$. The other material (2) has σ_y and K_{1c} values as 1515 MPa and 60.4 MPa $\sqrt{m}$. Determine if plane strain condition prevail or not if plate thickness is 10 mm . **[8] Mark**

[4] a- determine the total discharge flow over V – notch of height H and width b as shown in figure **[6] Mark**
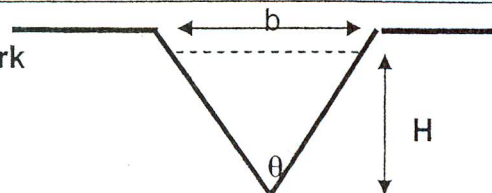
b- The Figure shows a water tank with a valve at the bottom. If this valve is opened,
i) What is the maximum speed attained by the water stream coming out of the right side of the tank? Assume that h = 12 m, L = 3 m, and θ = 30.0°, and that the cross-sectional area at A is very large compared with that at B.
ii) If the water flows at a rate of 0.0120 m³/s , find the radius of the tube B **[9] Mark**

Examiners: 1- Dr. Nabil Kinawy   2- Dr. Mohamed AboZeid

Mansoura University
Faulty of Science
Department of Geology

كلية العلوم
جامعة المنصورة

Seismic Exploration Method-1 (301 جف)

Answer the following questions:

First Question   *(5 m arks for each)*

a) Diving waves and boundary discontinuity
b) Energy partition at interface as a main type of seismic wave-attenuation
c) Reciprocal time and intercept time
d) Information needed to determine the depths to the first and second interfaces.

Second Question   *(10 marks for each)*

Write on each of the following:

a) Shallow refraction seismic problems
b) Geophone arrays of shallow refraction seismic data acquisition

Third Question   *(5 m arks for each)*

a) What is Snell's law? Why is important in seismic studies?

b) What is the reflection coefficient?

c) What are surface waves? body waves?

d) What are the different waves generated by a shot and recorded on a geophone?

B. SC. EXAM IN *Petroleum* GEOLOGY FOR THIRD PROGRAM

GEOPHYSICS (G318)

Hint: Answer <u>All THE QUESTIONS</u>

Question 1: Complete (15 Mark)

1. Folded traps may be produced due to …… movements or horizontal …… (3 Marks)

2. Vertical (downward) movements may create some folded traps due to …… (3 Marks)

3. The main cause of primary migration is ……, whereas the causes of secondary migration are ……. (3 Marks)

4. Zones of coats may be defined as …… (3 Marks)

5. Coated zones may be produced due to …… (3 Marks)

Question 2: Write in detail on the secondary stratigraphic traps (15 Mark)

Question 3: Give short notes on each of the following (30 Mark)

1. Keogen shale (6 Marks)

2. Conditions of genesis of hydrocarbons (6 Marks)

3. Combination traps (6 Marks)

4. The grounwater activity for hydrocarbon accumulation (6 Marks)

5. Evidences supporting oil migration (6 Marks)

Good luck
Dr. Ghaleb Essa

MANSOURA UNIVERSITY
Faculty of Science
Geology Department
Mansoura-EGYPT

Date:January12, Thursday **2012**
First semester - Academic Year 2011/2012
Full Mark: **60**
Time allowed: 2 hrs. (09.00-11.00 AM)

B. SC. EXAM IN SUBSURFACE GEOLOGY FOR THIRD PROGRAM

GEOPHYSICS (G317)

Hint: Answer All THE QUESTIONS

Question 1: Write briefly on each of the following   (20 Mark)

a. The nature of material   (5 Marks)

b. Technical steps of the discovery of economic deposits   (5 Marks)

c. Drilling   (5 Marks)

d. Diffusion and effusion of chemical elements   (5 Marks)

Question 2: Give short notes on: (20 Mark)

a. Factors affecting distribution and mobility of the elements (5 Marks)

b. Lithologic correlation   (5 Marks)

c. Facies   (5 Marks)

d. Pure scientific importance of subsurface geology   (5 Marks)

Question 3: Write on the following: (20 Mark)

a. Information needed for the subsurface evaluation   (10 Marks)

b. Definition of correlation explaining paleontologic and geochronologic methods
(10 Marks)

Good luck
Dr. Ghaleb Essa

Mansoura University
Faculty of Science
Geology Department
Time : 2 hours
Full Mark: 60 degree

First Term Exam (January 2012)
Third Level (Geophysic Programme)
Subject: G-315 (Economic Geology)
Date: 23-1-2012

Answer the Following Questions:-

Question One :   Complete the following sentences: 15 Degree

(1) Elements of the earth distribute themselves among the phases ...., ..., ...

(2) .... is the essential source of metals, so ....occurs in gabbro and .... in serpentine.

(3) Elements occur in rocks as ...., ..., ..., ..., ..., ...

(4) .... describe ores younger than the country rocks and ...... describe primary ore minerals.

(5) .... is a term used when less soluble minerals such as .... separated first then followed
By the most soluble minerals such as ...., ..., ...

(6) .... denote the least ratio of metal in the ore make it exploited while ...... depend on the
progress of technology and our need to the manufactured of gods.

(7) .... means in certain period and certain region conditions would be suitable to form
ore mineral deposits.

(8) Cretaceous mineral deposits in Egypt include, ..., ..., ...

(9) Precambrian mineral deposits in Egypt include........, ..., ...

(10)........ deposits occur away from igneous intrusion and ...... deposits occur near the intrusion.

Question Two :   15 Degree

(A) Give examples of ore mineral deposits: (6 degrees)

   1- Hypothermal, mesothermal and epithermal mineral deposits.

   2- Carbonate mineral deposits.

   3- Products of weathering processes.

(B) Correlate between the following: (9 degrees)

   1- Cavity filling deposits and metasomatic replacement deposits.

   2- Primary openings and secondary openings for formation of hydrothermal deposits.

   3- Physical and chemical conditions during crystallization of magma.

Question Three :   Write shortly on the following: 15 degree

(1) Kinds of mineral deposits formed by concentration with hydrothermal solution.

(2) Importance of economic pegmatites.

(3) Causes of differentiation of magma.

(4) Composition and kinds of residual solutions remain after crystallization of the magma.

(5) Examples of sedimentary mineral deposits and residual mineral deposits.

بقية الأسئلة خلف الصفحة

Question Four : Answer with right or wrong: **15 degree**

   (1) Cassiterite, chalcopyrite, sphalerite, pyrite, cinnabar, calcite, fluorite are formed in the late magmatic stage.

   (2) Rare earth elements, molybdenite, walframite, feldspar, mica, quartz are concentrated in hydrothermal solutions.

   (3) Vapour and gaseous transportation are help in differentiation of magma.

   (4) Residual solutions from magma consist from two kinds gaseous emanation and hot liquid.

   (5) Hot springs are considered acidic primary solution originated from magma.

   (6) Placer deposits, bauxites and laterites formed in the sea.

   (7) Silicate melt, sulphide melt and metallic melt phases occur only in the mantle.

   (8) Ni, Pt, Fe, Ti, Co and Cr can be found in acidic igneous rocks.

   (9) Cavity filling deposits are dominated at high temperature and pressure while replacement deposits dominate at low temperature and pressure near the intrusion.

(10) Fissures, faults, solution and shear zone cavities are considered secondary site for formation of hydrothermal deposits.

(11) The high pressure causes magma to crystallize and forms igneous rocks, thus high soluble minerals separated first.

(12) Magma is complicated solution formed of oxides, silicates, sulphides and volatile substances of Cl, Br, Hf, HCl, H_2S, H_2O, N, S and P.

(13) Pentlandite, magnetite, chromite, olivine are separated in the main magmatic stage.

(14) Aswan Fe, phosphate deposits and kaoline formed in Cretaceous.

(15) CO_2, temperature and pressure of solution, organic biota are factors affecting carbonate deposition.

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Exam Committee:

Prof. Dr. Amin Gheith

Mansoura University
Faculty of Science
Geology Department

جامعة المنصورة
كلية العلوم
قسم الجيولوجيا

Magnetic Prospecting Final Exam (third level Geophysics ٢٠١٢)

طرق التنقيب المغناطيسيه جف ٣٠٨ (المستوى الثالث برنامج الجيوفيزياء) ٢٠١٢/٦/١٥ صباحى

Answer the Following Questions   (Total mark 60)

1- Define of the following: (15 mark)

a- Geomagnetic maps.

b- Primary and secondary base station.

c- Remnant and induced magnetization.

d- Curi temperature.

e- Potential geophysical methods

3- Mention the reasons for the following :   (15 mark)

a- Interpretation of magnetic methods more complicated than gravity.

b- In magnetic, repetition time of measurements at the base station is shorter than gravity

C-Magnetic survey is usually used for detecting subsurface basement and sedimentary basins.

3- Explain Three of the following with illustrations: (15 mark)

a- Hysteresis loop

b- Elements of the earth's magnetic field

c- Flight pattern of aeromagnetic survey

d- Fluxgate magnetometer

4- Write on Three of the following: (15 mark)

a. Magnetization of rocks and their types

b. Ground magnetic field survey

c. Factors affecting shape of magnetic anomalies

d. Application of magnetic methods

Best Wishes
Prof. Dr. Hosni Ghazala *

Prof. Refaat Sherif
Prof.Dr. Abdel Kader Zalata
Dr. Hamdi Serag El Din

Answer the following questions:

1- Mark with Yes or No (10 marks)

1. The true dip of a line is measured in direction normal to the strike of a plane containing it.
2. The apparent dip usually pitches 90° with strike of an inclined plane.
3. The axial trace of plunging folds plunges even the earth's surface is leveled horizontally.
4. The stratigraphic sequence is inverted if the layers are getting younger downdip.
5. The narrow exposures surely indicate shallow-dipping rock units with irregular topography.
6. The attitude of axial planes is described by strike,dip for recumbent folds.
7. Sequence repetition on geological maps one-side is a mirror image of the other side in a folded terrane.
8. Strike lines of an axial plane is in a horizontal attitude even the fold is a doubly plunging.
9. Equal strike distances mean monoclinal structures.
10. The true thickness of a vertical dyke can be determined on a cross section view normal to its strike.

2- Chose the correct answer (10 marks)

1. The attitude of a fault plane is S70°W/30° means that the fault plane
a) strikes 70°SW
b) dips 30°SW
c) dips S70°W
d) b and c

2. The fault is strike-slip if the displacement is in a ....direction
a) 130°
b) 280°
c) 340°
d) 250°

3. A fold axis of overturned anticline plunges 340°/45° that means the exposures of the fold limbs on a geological map
a) converge northwestward if the earth's surface is leveled.
b) are parallel exposures even the earth's surface is irregular.
c) a and b
d) converge southward if the earth's surface is leveled.

4. The fault of item (1) is a .... if it crossed the fold of item (3).
a) southward dipping traverse
b) northeast trending longitudinal fault
c) southwest dipping longitudinal fault
d) northwest trending traverse fault.

5. If the fold of item (3) traversed by a NE-SW striking normal fault the exposures of the fold's core across this fault are
a) wider southwest if the fault dips southeast.
b) wider southeast if the fault dips northwest.
c) wider northwest if the fault dips northwest.
d) of the same width.

3- Discuss the followings; use suggested figures wherever needed (40 marks)

a) The advantages and disadvantages of aerial photographs and geologic maps in field work.
b) The V-rule.
c) What will you do if you surveyed a magnetized body using the field compass?
d) Comment on the layer dimensions (width of exposures, true thickness,....etc) and derive their mutual relationships on horizontal and sloping surfaces.
e) The fold core exposures across traverse faults.

Best Regards