Mansoura University
Faculty of Science
Geology Department

Date: 14/1/2016
Time allowed: Two hours

Final Exam in Subsurface Geology Course (G-317) for Third level, geophysics program, first semester

First Question (12 marks)

Mark (√) in front of the right statements and mark (×) in front of wrong statements, (correct the wrong statements).

1. The percussion drilling is used for exploration for hydrocarbons in deep areas. ( )
2. The structure contour maps measure thickness of the rock units. ( )
3. The salinity of the ground water in the basin center is more saline than that in the basin margin. ( )
4. The core samples are obtained from the seismic surveys. ( )
5. The generation of hydrocarbons occurs only at deep subsurface areas. ( )
6. Water based mud fluids are used in drilling in areas of thick mud. ( )
7. Evidences of subsurface pressures include generation and migration of hydrocarbons. ( )
8. Abnormally low heat flow occurs along midocean ridges and intracratonic rifts. ( )

Second Question (12 marks)

Compare between FOUR ONLY of the following (Using drawing if necessary).

1. Cable-tool drilling and Rotary-tool drilling.
2. Lithostratigraphic and biostratigraphic correlation.
3. Core and ditch samples.
4. Interpretation of subsurface structural contour maps and interpretation of the isopach contour maps.
5. Importance of Seismic surveys and gravity method in subsurface geology.

Please turn over the page

Level: 3rd Program: Geophysics Numerical Analysis (M 303) 303 ؛	Faculty of Science Mathematics Department	1st Semester Time:2 hours Date: 11/01/2016 Total Grades: 80

Answer the following Questions: (Use four-digit rounding arithmetic)

Question (1)

(1) Define (5 Marks)

(i) Fixed point, (ii) Lipschitz condition.

(2) Solve the following linear system (15 Marks)

$$2x_1 + 2x_2 + x_3 = 1$$
$$4x_1 + 5x_2 + 3x_3 = 3$$
$$2x_1 + 3x_2 + 3x_3 = 5$$

By (i) LU decomposition method, (ii) Gaussian elimination method.

Question (2)

(1) Derive Newton-Raphson method, and use it to find p_4 for $f(x) = 3x - e^x$ on $[1, 2]$.

(2) State and prove under what condition(s) the function $g(x)$ has a unique fixed point in $[a, b]$. (10 Marks)

(3) Show that the following initial value problem has a unique solution and find an approximation to it.

$$y' = xe^{3x} - 2y, \quad 0 \le x \le 1, \quad y(0) = 0, \text{ with } h = 0.5$$ (10 Marks)

Question (3)

(1) State and derive Newton Forward-Difference Formula. (10 Marks)

(2) Use a suitable interpolating polynomial to approximate $\sqrt{3}$ with the values $x_0 = -2, x_1 = -1, x_2 = 0, x_3 = 1, x_4 = 2.$ and an appropriate function $f(x)$. (10 Marks)

(3) Consider the function $f(x) = \ln(x)$ and $x = 1, 1.05, 1.1, 1.15, 1.2$. Find an approximate value for (10 Marks)

(i) $f'(1.1)$, using 3 and 5-point formula (ii) $\int_1^{1.2} f(x)\,dx$, $n = 4$.

Best Wishes; *Dr. Tamer Mohamed Ahmed El-Azab*

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

First Term Exam (January 2016)
Third Level (Geophysics Program)
Subject: G-315 (Economic Geology)
Date: 14-1-2016

Answer the Following Questions:-

Question One : Write short notes with examples of ore minerals **(20 Degree)**

1- Concentration by fractional crystallization of magma.
2- Cavity filling and metasomatic replacement deposits.
3- Concentration by sedimentation processes.
4- Products of weathering products.

Question Two: Give a suitable scientific term: **(20 Degree)**

1- Less soluble minerals separated first then followed by the most soluble.
2- Rocks and ores slowly dissolved and different metal is deposited.
3- Ore minerals are formed later than the surrounding rocks.
4- Useless minerals occur within the ore.
5- Least ratio of metal in the ore.
6- Conditions sometimes suitable for forming mineral deposits.
7- Geological body from which metal extracted.
8- Content of metal in the ore.
9- Arrangement of metal ores in zones around igneous intrusion.
10- Ranges of uses from the ore.

Question Three : Write briefly: **(20 Degree)**

1- Role of volatile constituents in the residual solution.
2- Factors controlling contact metamorphism and metasomatic deposits.
3- Factors controlling deposition of carbonates in sea water.
4- Causes of magmatic differentiation.

Exam Committee*:

Prof. Dr. Amin Gheith* ***Prof. Dr. Mohamed Abed*** ***Dr. Ghalib Essa*** ***Dr. Mohamed Awad***

Mansoura University Faculty of Science Physics Department Subject: Physics		First Term third Year :Geo-Physics Date : Jan 2016 Time allowed : 2 hours
Course (s): Elasticity & Fluid Mechanics **phy332**		Full Mark:: 60Mark

Answer THE FOLLOWING Questions: Each Question (15) Mark

[1] a- State and distinguish the five categories of available materials to practicing engineers and show how can we select a material to make a gas cylinder. **[7] Mark**

b- A wire of length ***L***, Young's modulus ***Y***, and cross-sectional area ***A*** is stretched elastically by an amount ΔL. By Hooke's law, the restoring force is $-k\,\Delta L$.

(i) Show that $k = YA/L$.

(ii) Show that the work done in stretching the wire by an amount ΔL is **[8] Mark**

$$W = \frac{1}{2} YA\,(\Delta L)^2 / L$$

[2] a- Fatigue is a phenomenon of material failure under cyclic stress. Illustrate how repeated stress cycle can enhance the fatigue crack propagation. **[6]Mark**

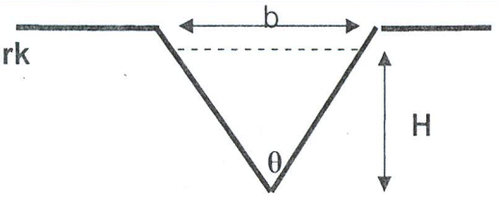
b – For a bronze alloy, the stress at which plastic deformation ***begins*** is **275 x10^{6}Pa,** and the modulus of elasticity is **115 x10^{9}Pa. i)** What is the maximum load that may be applied to a specimen with a cross-sectional area of **325 mm^2** without plastic deformation?

ii) If the original specimen length is **115mm,** what is the maximum length to which it may be stretched without causing plastic deformation? **[9] Mark**

[3] a- Prove that" The volume of an object does not change" under the influence of applied shear forces on it. **[7] Mark**

b- A steel cable **3 cm^2** in cross-sectional area has a mass of **2.4 kg** per meter of length. If **500 m** of the cable is hung over a vertical cliff, how much does the cable stretch under its own weight? $Y_{steel} = 2.00 \times 10^{11}$ **N/m^2.** **[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- A vertical cylindrical tank **2m** diameter has, at the bottom, a 0.05m diameter sharp edged orifice.

i) If water enters the tank at a constant rate of **0.0095 m^3/s** ,find the depth of water above the orifice when the level in the tank becomes **constant**

ii) Find the time for the level to fall from **3m to 1m** above the orifice when the inflow is stopped.

Iii) If water now runs into the tank at **0.02m^3/s** ,the orifice remaining open, find the rate of rise in water level when the level has reached a depth of **1.7m** above the orifice. **[9] Mark**

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

Mansoura University
Faculty of Science
Department of Geology

3rd Level, Geophysics Students 2015-2016
Final exam, Petroleum Geology (G318)
Time allowed: 2 Hours
Date: 18/1/2016

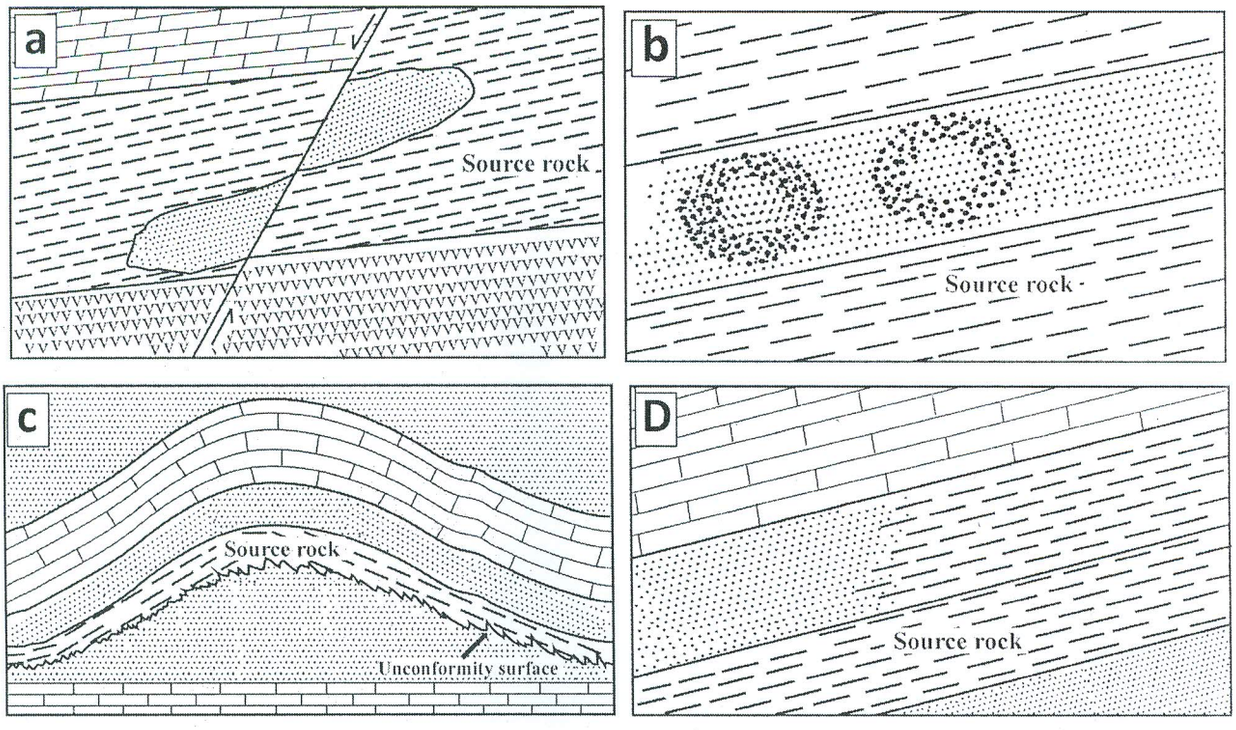
1- Write on:

a- Traps produced due to groundwater activity. (12 marks)
b- Surface occurrences of petroleum. (12 marks)
c- Stratigraphic traps with permeability produced during deposition. (12 marks)

2- Complete the following:

a-Seepage may be identified by natural or ..... means producing an ".....".
Oil and gas seeps are qualitative and not ..... (3 marks)
b- Migration is defined as a probable ..... in the history of petroleum. It may be .....
or ..... The first one takes place from ..... to ..... with .....
movements, whereas the second type takes place through the ..... rocks. (7 marks)
c- Petroleum is primarily a product of the diagenesis of ..... (6 marks)
d- Kerogen is defined as the ..... constituents of .....
which are ..... in organic or ..... solvents. (8 marks)

3- Comment on the following figures, illustrating the places in which the petroleum accumulates and showing the direction of movement of petroleum on the given figures. (20 marks)



With my best wishes
Dr. Ghaleb Essa

لجنة الممتحنين: أ.د. آدم الشحات أ.د: حمدى صيصة د. غالب عيسى* د. هيثم العطفى

Final Exam of 3rd level of students
(Geophysics)
Course: Field Geology
Code: Geo 305
Date: 21/1/2016
Time: 2 hours

Mansoura University
Faulty of Sciences
Department of Geology

Answer all the followings

Q1. Rewrite the following statements if exist. **(20 marks)**

1- Cut-off line represents the exposure of a horizon on the earth's surface.
2- The clinometer measures orientation of the true dip of a plane.
3- The mirror image repetition of exposures is a common feature about the axial trace of an overturned fold.
4- The magnetic declination is the angle between the magnetic and geographic north.
5- The vertical angle is the angle between the direction of the true dip and strike line of a plane containing it.
6- The strike lines are used for describing attitude of any horizontal plane.
7- The oldest rocks occur uphill if the sequence is inverted.
8- The hairline is used during sighting an object by the Brunton compass.
9- The orientation of a line is defined by trend of its strike.
10- Zigzag-shaped contour lines mean that the represented surface is a train of plunging folds.

Q2. Write briefly on the followings. **(20 marks)**

1- The V-rule of layer exposures around a stream.
2- The layer thicknesses and their mutual relationships with dip and gradients angles.
3- Instruction of field compass.

Q3. Discuss the followings with suitable illustrations. **(20 marks)**

1- The traverse faults across folds.
2- Fault parameters.

Examiners:

Prof. Adam El-Shahat Prof. Mahmoud El-Sherbibi Dr. Ghaleb Essa **Dr. Ahmed Shalaby

Mansoura University
Faulty of Science
Department of Geology

January, 28, 2016
Time allowed: 2 hours
Full Marks: 60 marks

Seismic Exploration Method
(جف ٣٠٣)

Answer the following questions:

First Question *(5 m arks for each)*

Write short notes on each of the following:

a) What is geophone? Draw its main parts? How does it work?
b) Vertical seismic profiling (VSP)
c) Draw the converted P and S wave paths from an incident P wave on a first order boundary ($V_2 > V_1$)
d) Attenuation of seismic waves.

Second Question *(5 marks for each)*

Answer the following questions.

a) Briefly explain situations in which refraction exploration can fail to detect a subsurface layer. Why?
b) Reversed profile arrays in shallow refraction seismic method
c) Explain graphically the ray paths showing the possible routes for multiple reflectors?
d) Define the meaning of uphole and downhole seismic survey.

Third Question: ***(20 Marks, 2 for each)***

Rewrite the following sentences after doing the required correction(s), if exist:

a) The intersection of backward extrapolation of the traveltime curve with time axis is known as cross over point, while the forward extrapolation of the traveltime with the opposite time axis is known as Intercept time.

b) Total reflection (wide angle reflection) occurs when the incident angle is less than the critical angle

c) The acoustic impedance of a medium defined as the ratio of velocity and the bulk modulus

d) The primary wave (P wave) is known also as irrotational wave and transverse wave.

الممتحنون أ.د/ حمدى صيصه*- ا.د. حسنى غزالة د.أحمد الجلادى د. وليد شكرى

e) Head waves represent the critically refracted waves and known also as later arrivals and reflected waves

f) The critical distance is the distance on a seismic refraction travel time-curve at which the travel times of the direct and refracted waves are the same

g) In a seismic refraction survey, the slope of the travel-time curve depends only on the thickness of the layers

h) Geometrical spreading means that the particle motion of the seismic wave causes the material to be distorted and waves energy is converted into heat.

i) Ground roll is defined as a type of coherent noise generated by a surface wave, typically a low-velocity, low-frequency, high-amplitude

j) Reciprocal times are total travel times from the. first geophone to the last geophone of a spread