المستوى الثاني - جيوفيزياء - موجات (ف ٢٠١١)

Mansoura University	First term Exam.	Jan. 2011
Faculty of Science	Geophysics	2 Hours
Physics Department	Waves and Vibrations	
Answer all the questions		

1-a)	Define the reflectance coefficient and find it for two connected strings with mass per unit length 36 and 25 gm/cm	[12]marks
b)	Find the resultant superposition of two perpendicular waves and find the condition to obtain a straight line with positive slope.	[12]marks
2= a)	Find the normal mode of oscillation of a string fixed at one end and free at the other.	[11]marks
b)	Prove that the velocity of propagation of waves in gases depends on the pressure, density per unit length.	[12]marks
3-a)	Solve the differential equation of damping oscillation.	[11]marks
b)	Two trains move towards each other, the first by a speed 60 Km/hour and the second with a speed 45 km/hour. What the apparent frequency to be heard in the second train if the first train whistled by a frequency 512 Hz.	[12]marks

المستوى الثانى - برنامج جيوفيزياء - مقدمة فى الجيوفيزياء (الجف ٢٠١)

MANSOURA UNIVERSITY
Faculty of Science
Geology Department
Mansoura-EGYPT

Date: Sunday, 09 January **2011**
First semester –Academic Year 2010/2011
Full Mark: 60
Time allowed: **2** Hours- (*09.00-11.00 AM reading time*)

B. Sc. Exam in GPHY-201 "جف ٢٠١" (Geophysics) for 2nd Year (Geophysics "Credit Hours Board)

GPHY-201 (Relating to material taught by Dr. Mohammed Awad Ahmed)

*Instruction: Answer **all questions** from **Q1 (A and B)**, **all questions** from **Q2 (A and B)**, **and five questions** from **Q3**. In your answers use labeled diagrams and provide specific, named examples wherever possible. No aids allowed.*

Q1: **(25 Marks)**

Q1-A: Define the following: **(5 Marks)**

Wireline logging	Engineering geophysics	Critical distance
Logging while drilling	Environmental geophysics	

Q1-B: Complete the following **(20 Marks)**

1) The **.....(1).....**method detects lateral variations in density. Both lateral and vertical density variations are important in the seismic method.

2) There are two forms of noise: **.....(2).....** and **.....(3).....**

3) A geophone placed at **.....(4).....** would receive both the direct and the refracted wave at exactly the same time.

4) The free-air correction is the difference between gravity measured at sea level and at an elevation of h meters with no rock in between and it is **.....(5).....** at elevations above sea level.

5) The successful geophysical survey design requires careful consideration of the following main factors: **.....(6).....**, **.....(7).....**, **.....(8).....**, **.....(9).....**, and **.....(10).....**

6) A **.....(11).....**correction that accounts for the time-varying gravitational attraction of the sun and moon.

7) **.....(12).....** methods are those that detect variations within the natural fields associated with the Earth, such as the gravitational and magnetic fields.

8) Some sondes are designed to be operated in a centralized position in the borehole. This achieved by the use of **.....(13).....**, or by **.....(14).....**

9) The basic elements of planning a geophysical survey are: **.....(15).....**, **.....(16).....**, **.....(17).....**, **.....(18).....**, **.....(19).....**, and **.....(20).....**

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Q2: **(10 Marks)**

Q2-A: Answer Yes or No **(5 Marks)**

1) Gravitational acceleration is the same everywhere on the Earth's surface

2) The best **orientation of a profile** is normally **at right-angles to the strike of the target**.

3) The surface gravitational acceleration at the equator is larger than at the North Pole

4) Interpretation may be either **qualitative** or **quantitative** depending on the type of method employed, the end use of the data, and available budgets.

5) Bouguer correction is made to remove the effect of excess mass below observation point and sea level

Q2-B: State the appropriate geophysical methods for each of the following application: **(5 Marks)**

1) Exploration for metalliferous minerals

2) Depth to lithological boundary

3) Detection of sub-surface cavities

4) Exploration for hydrocarbons

5) Porosity

Q3: Write short notes on: **(25 Marks)**

1) Gravity surveying on land (5 Marks)

2) What happen to a body wave rays that are incident on a boundary at angle (**less than - equal to – larger than**) the critical angle ic? (5 Marks)

3) Advantages and disadvantages of geophysics (5 Marks)

4) Compare between seismic body waves and surface waves (5 Marks)

5) Is the surface gravitational acceleration larger at the equator or at the North Pole? (Explain) (5 Marks)

6) Log layout format. (5 Marks)

7) Draw travel-time curve for single horizontal layer model with planer horizontal interface? (5 Marks)

BEST WISHES

Mansoura University
Faculty of Science
Geology Department

Final Theoritical Exam
1st Term 2010/2011

Date: 27 / 01 / 2011
Time Allowed: Two Hours
Full Mark: 60 Marks

نظام :-- الساعات المعتمدة الفرقة :-- المستوي الثاني برنامج :-- الجيولوجيا / الجيوفيزياء

الورقة الامتحانية :-- ج ٢٠٢* المقرر:-- بصريات المعادن والمعادن المكونة للصخور

Optical Mineralogy + Rock-Forming Minerals

Answer **Three** Questions from the Followings:- (20 Marks each question - 5 Marks each part)

1- Draw the followings :--
   - A- Uniaxial indicatrix.
   - B- Behaviour of light in the microscope.
   - C- Double and chain silicate structures.
   - D- Nicol prism.

2- Compare between the following pairs :--
   - A- Gypsum plate and quartz wedge.
   - B- Colours of 1st and 2nd orders.
   - C- Micas and Feldspars.
   - D- double refraction and twinkling.

3- Describe in detail the followings :--
   - A- Pleochroism.
   - B- Biaxial indicatrix.
   - C- Controlling factors on refractive index.
   - D- Amphiboles and pyroxenes.

4- Write short notes on the followings :--
   - A- Factors affecting interference colours.
   - B- Extinction.
   - C- Ring and sheet silicate structures.
   - D- Optic axis and relief.

GOOD LUCK & BEST WISHES

لجنة التصحيح :- أ.د. عمر حجاب – د. شعبان مشعل*

المستوى الثاني - جيوفيزياء - علم الصخور (٢٠٤)

Mansoura University
Faculty of Science
Geology Department
Date: 13 Jan., 2011

Final Exam (January 2011)
Second Level (Geophysics Program)
Subject: G-203 (Petrology)
Total Marks: 60 Time: 2 hours

Answer the following questions:

Question ONE: Complete the following: **(15 marks)**

1- ..... is a good index to the maturity of a sediment.

2- Material coarser than 1/16 mm can analyzed by ..... method.

3- Cemented sediments and compacted during burial are called .....

4- Processes by which sediment particles laid down in beds called .....

5- Changes that happened to sediments after deposition called .....

6- ..... deal with larger features of the rock in the outcrop.

7- Sediments with mud matrix, poor sorting and angular grains are described as.....

8- .....is a measure of the relation between the 3 dimensions of an object.

9- .....is the percentage of pore spaces to the total volume of the rock.

10- Detrital minerals include .....,.....,.....,.....,.....,.....

11- Chemical minerals includes.....,.....,.....,.....,.....

12- Structures of sedimentary include.....,.....,.....,.....

13- .....is the property of a rock which allows the passage of fluids.

14- .....characterized sedimentation units marked by gradation in grain size.

15- .....used as guide to the environments of deposition.

Question TWO: Give a suitable name for these rocks: **(15 marks)**

1- Lithified, non-laminated clays, containing angular and rounded rock fragments polished and striated.

2- Indurated rock composed of rounded fragments of volcanic origin.

3- Fragmentation accomplished by movements along a fault surface.

4- Sandstone with rock particles exceeds 25%.

5- Sandstone with matrix more than 15% and feldspar exceed rock particles.

6- Sandstone with matrix less than 75%.

7- Laminated rock whose particles have size less than 1/16 mm.

8- Semi friable mixtures of clay materials and lime carbonate.

9- Unconsolidated porous silt, oxidized, immature, calcareous and lack stratification.

10- Pure organic mud-rocks.

11- Impure lime of calcium carbonate formed in arid region by evaporation of lime bearing waters.

12- Biochemical deposits formed by constructive activity of organisms.

13- Pure chemical precipitation of carbonate insitu.

14- Carbonate materials have been transported and re-deposited and have analogous to sandstone.

15- Cemented accumulation of shells and shell fragments.

---------- *P.O.T*

Question THREE: ***Choose the correct answer from the following:*** ***(15 Marks)***

1- Coarse grained foliated texture is defined as (granulose – schistose – hornfelsic – gneissose) texture.

2- Pegmatites are crystallized from (volatile-rich - fast cooled – highly viscous) magma.

3- Metamorphism of limestone yielded (schist – gneiss – marble – amphibolite) rock.

4- Dunite composes of (garnet – biotite – quartz – olivine) mineral.

5- The main agent of contact metamorphism is (P, T, and fluids - T - P - active Fluids).

6- Mica-rich metamorphic rocks are generated from (shale – sandstone – mafic igneous – ultramafic igneous) rocks.

7- Obsidian is characterized by (porphyritic – hyaline – coarse-grained – foliated) texture.

8- Acidic igneous rocks should contain (olivine – pyroxene – amphibole – quartz) mineral(s).

9- Dykes are (volcanic – plutonic – hypabyssal) igneous bodies.

10- Dacite is the volcanic equivalent of (diorite – gabbro – granite – granodiorite)

11- Eclogite composes of (garnet & pyroxene – quartz & orthoclase – olivine & pyroxene – mica & plagioclase).

12- Vesicular texture characterizes (plutonic – hybabyssal – volcanic) rocks.

13- Scoria is (felsic – mafic – ultramafic – intermediate) rock.

14- Slate is formed as a result of (low – medium – high – ultra-high) grade of metamorphism.

15- Metasomatism is a process caused by the influence of (P, T, and fluids - T - P - active Fluids).

Question FOUR:

a- complete from the following: ***(9 Marks)***

- The yielded metamorphic rocks depend on ....(1)....., ...(2)..... and .....(3).....
- The early-formed mafic igneous mineral is .....(4)..., while the latest-formed mineral is ....(5)....
- Crystallization of lava formed ....(6)...-grained rocks, while plutonic rocks are generally ....(7)...-grained.
- Talc schist are formed from ....(8)... igneous rocks, such as ....(9)....that composes of pyroxene and olivine.
- Foliation and granulose textures are a results of ....(10)....and ....(11)... pressure-types, respectively.
- Acidic magma are rich in ....(12)...., ...(13).... and ....(14)... oxides.
- based on mode of occurrence, igneous rocks are classified into .....(15)....., ...(16)..... and .....(17).....
- Quartzite rocks is formed as a metamorphism of .....(18).....

b- Describe the mineral composition, texture, mode of generation, color of the following rocks: ***(6 Marks)***

1- Basalt

2- Amphibolite

3- Granite

4- Pyroxenite

---------- With our best wishes

Examiners: *Prof. Dr. Amin Geith* *Dr. Mahrous Abu El-Enen*

Mansoura University
Faculty of Science
Geology Department

Date: 18/1/2011
Time: 2 hours

Final Exam.
Subject: STRUCTURAL GEOLOGY
2nd level Students of Geology

Course: Geo 204
Full marks: 60 marks

Answer the Following Questions

Support your answer with suitable illustrations as can as possible

Q1. Briefly comment on the differences between: (30 marks; 5 marks per each)

1- The strain field where S_1 is vertical to layer and S_2 are more and less than unity.
2- Deformed veins in monoclinic and orthorhombic symmetries of strain ellipse.
3- Plunging syncline and anticline on map, frontal and lateral cross-section views.
4- The Negative and positive flower structures.
5- The drag and rollover folds on normal, reverse and strike-slip faults.
6- Constructional and extensional duplexes and fan structures.

Q2. Mention the structures would expected in the following cases: (20 marks; 2 marks per each)

1- Definite type of faults at basin boundaries related to continuous basin subsidence with consequence sedimentations.
2- Layers are repeated within a well log.
3- In an extensional terrane, the major fault of a rift passes deeper into the mantle.
4- Sole fault affecting rock units on geological maps.
5- Extension on imbricate listric faults.
6- Structural features formed within pull-apart basins.
7- Folding of layers with high contrasts in competency.
8- Possible structures formed due to local erosions of allochthons
9- Reclined folds superimposed by upright ones.
10- Displacements on R, P and R' shear arrays.

Q3. Mention the scientific terms of the followings: (10 marks; 1 mark per each)

1- An imaginary plane subdividing the interlimb angles of folded layers and passing through their hinges.
2- A type of folds that have foid axis.
3- A type of folds in which their limbs dip in the same direction.
4- A type of folds in which their limbs dip with different amounts.
5- A line of intersection of fold limbs.
6- Folds have older rocks in their cores but they have troughs.
7- Folds plunge in two directions.
8- Folds with circular outcrops on map views and involve younger layers in its core.
9- A type of fault formed with displacement parallel to one of its apparent dip.
10- A type of ductile shear zones in which vertical extension coevals with lateral displacement.

Regards
Examiners:
Dr. Farid Makroum *
Dr. Ahmed Shalaby*

كلية العلوم
قسم الرياضيات

الفـــرقة: الثانية – برامج
الشـــعبة: چيوفيزياء
المـــادة: رياضيات بحتة-
ر (٢٠٦)

دور : يناير ٢٠١١
التاريخ: ٢٠١١/١/١١
الزمن : ساعتان
الدرجة الكلية: ٨٠ درجة

أجب عن الاسئلة الاتية (درجة السؤال ٢٠ درجة)

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(١) أ- أوجد النهايات العظمى والصغرى للدالة $f(x,y) = x^2 + y^2 - \frac{1}{2}x^4$

ب- أثبت أنه اذا كانت $z = z(x,y)$ بحيث أن $x = \varphi(z) + \psi(y)$ ،

فان $z_x \; z_{xy} = z_y \; z_{x^2}$.

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(٢) أ- استخدم نظرية جرين لايجاد التكامل الخطى

$$\oint_c (x^5 + 3y)\,dx + (2x - e^{y^3})\,dy$$

حيث c هى منحنى الدائرة $x^2 + y^2 = 4$.

ب- باعتبار $I_n = \int_0^{\frac{\pi}{2}} \sin^n x\,dx$ ، $J_n = \int_0^{\frac{\pi}{2}} \cos^n x\,dx$ أثبت أن

(i) $I_n = J_n$

(ii) $I_n = \frac{n-1}{n} \; I_{n-2}$, $n = 2,3,4,....$

ثم استخدم ذلك لايجاد قيمة التكامل $\int_0^{\frac{\pi}{6}} \sin^2 3x \;\; \cos^4 3x\,dx$.

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(٣) أ- أوجد حل المعادلة التفاضلية $y(1) = 2$, $y' = \frac{y-1}{x+1}$.

ب- حل المعادلة التفاضلية $(2x-4y+5)\,dy + (x-2y+3)dx = 0$.

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(٤) أ- أثبت أن $\frac{1}{x^2}$ هو عامل مكامل للمعادلة التفاضلية الآتية ثم حلها

$$(2x^2 + y)dx + (x^2 y - x)dy = 0$$

ب- أوجد الحل العام للمعادلة التفاضلية $\frac{dy}{dx} + y\sin x + y^3 = 0$.

مع أطيب التمنيات بالنجاح

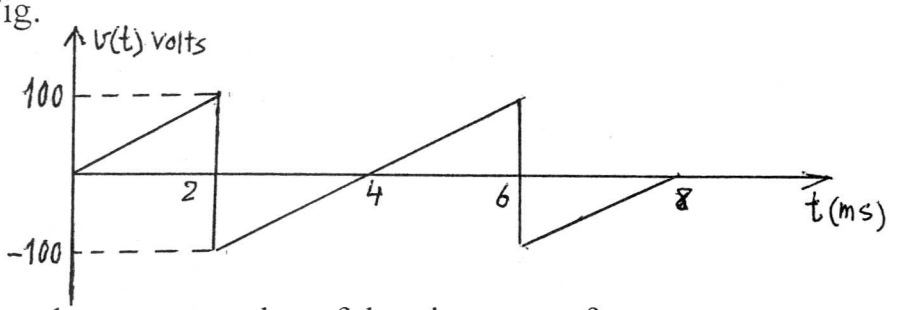
المستوى الثانى - جيوفيزياء - دوائر كهربية وتيار متردد

Mansoura University
Faculty of Science
Physics Department

1st term Exam. 2011
2nd year student Geophysics
Electric circuits

Answer the following questions — Allowed time 2h

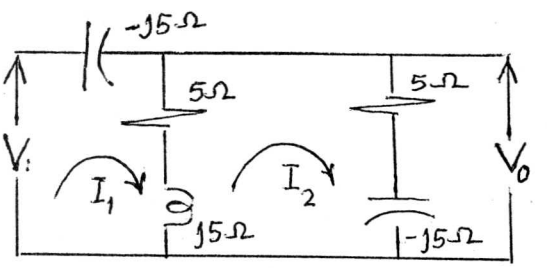
1- A pure inductance of 0.05 H has an applied voltage of waveform as shown in Fig.



a) Determine the average value of the given waveform.

b) Sketch the current waveform and find its maximum value

2- For the selected mesh currents shown in the given network , determine :
a) the voltage transfer function .
b) the power dissipated in the circuit resistors , given that $V_i = 50\angle 0^\circ$



3- a) Derive a relation between the quality factors of R-L and R-C circuits at resonance

b) Define the coupling coefficient (K) and derive an expression for the mutual inductance between two coils of self inductances L1 and L2

التعاملوه بالتصحيح :

١ - ا.د. أحمد الجرابى
٢ - ا.د. أحمد حمزه عرابى
٣ - ا.د. محروص ذاكر
٤ - د. عزيزه عطا