Mansoura University
Faculty of Science
Geology Department
Date: 22/06/2010

Second Term Exam (June 2010)
Second Level (Geology)
Course No.(Geo.205)
Course: Sedimentation & Sedimentary Rocks
Time: 2 hours Full Mark: 60

Answer the Following Questions

Question One : Tick (√) or (X) and correct (20 marks)

1. the net result of frost action is disintegration of the original rocks.
2. high- magnesium calcite is more stable than low-magnesium calcite.
3. in the platykurtic frequency curve of a sediment the ends are better sorted than the center.
4. syntaxial overgrowth on echinoderm grains is an example of degraded neomorphism.
5. the porosity of massive sandstone is higher than that of the fractured sandstone.
6. cross-bedding in grainstone indicate deposition in low energy environment.
7. in all methods of porosity measurement the total porosity is measured.
8. caliche is a lime-rich deposit formed in the soils of wet regions.
9. in a steady flow (U) is highest at the free surface.
10. aragonite is not commonly frequent in old limestone because of its stability.
11. mineralogical maturity is achieved through diagenesis.
12. limestone textures are not affected by large scale dolomitization.
13. cementation of sandstones with calcite requires initial porosity.
14. travertine is specially common in limestone caves.
15. the rounded pebbles are associated with collapse sediments.
16. allodopic limestones are deposited by turbidity current in shallow marine environments.
17. sandstones contain less polycrystalline quartz grains is more mature.
18. conversion of large crystals of allochems into micrite is due to aggrading neomorphism.
19. heavy minerals are useful tool in determining the provenance of sediments.
20. Pelecpods, Gastropods and some Corals use aragonite in their shell structure.

Question Two: Complete (20 marks)

1- the chemical union of water with the mineral phase is.....
2- calcite in limestone was originally extracted from sea water by.....
3- the loss or gain of elements in the weathering mantle reflect the.....of oxides.
4- The early cement in beach rock is either aragonitic or.....
5- permeability is the ability of .....to.....through a porous sediment.
6- the presence of broken delicate shells in calclutite is good evidence of.....
7- Froude number considers the ratio between.....and.....forces.
8- pellets are distinguished from.....by their lack of internal structure.
9- eolian action is much more effective.....than fluvial.
10- dolomitization proceeds by migration of.....solution through limestone.
11- the sequence of textural maturity is.....,.....and.....
12- .....is a fine grained rock differs from micritic limestone in being friable and porous.
13- the side of current ripple with steep slope is the.....and that of low slope is the.....
14- micritization of allochems is due to the action of.....algae.
15- lithic greywacke is a sandstone rich in.....and.....
16- mud-supported limestones include mudstone and.....
17- quartz grains in sandstones showing undulatory extinction is derived from.....
18- incomplete dolomitization produces scatter of.....euhedra in unaltered calcitic matrix.
19- if plagioclase shows zoning then it is likely derived from.....
20- .....is a sponge porous carbonates formed near springs and bears imprints of leaves.

اقلب الصفحة

لجنة التصحيح: Prof.O.Hegab and Prof.A.Elshahat

Question Three: Choose the correct answer (20 marks)

1-The more susceptible rock to chemical weathering is
a- sandstone b- limestone c- granite
2- biomoldic and oomoldic porosities of carbonate rocks develop due to
a- early cementation b- micritization c- solution
3- because of relative mobility of oxides, soils are enriched in
a- Mg O b- Al2O3 c- Na2O
4- the size of micritic grains is
a- ≥ 2mm b- 2- 0.063 mm c- 1 – 4 μ m
5- which of the following rocks is higher in porosity
a- arenaceous sandstone b- calcareous sandstone c- argillaceous sandstone
6- grainstones are characterized by
a- high porosity b- absence of micrite c- common micrite
7- which of the following porosity is not primary
a- intra granular b- inter granular c- intercrystalline
8- compaction is not common in most limestones due to
a- early cementatiom b- late compaction c- presence of allochems
9- grains that move significant distance without contact the bottom is the
a- coarse b- medium c- fine
10- the process whereby dissolved matter precipitates in the pore spaces of a sediment is
a- weathering b- compaction c- cementation
11- the effect of rubbing one pebble against another is
a- abrasion b- impact c- grinding
12- boundstone is a limestone in which the original component bound together during
a- deposition b- compaction c- cementation
13- the more mature argillaceous rocks are enriched with
a- Al2O3 b- CaO c- Na2O
14- allodopic limestones are characterized by
a- benthic fossils b- pelagic fossils c- benthic and pelagic
15- the solubility of silica is increased by the
a- increase of pH b- decrease of temperature c- increase of crystallinity
16- grainstones include both
a- wackeston & packstone b- boundston & mudstone c- calcarenite & calcrudite
17- sandstone contains <10% matrix , 5% feldspars and > 50% rock fragments is
a- lithic arenite b- lithic wacke c- subarkose
18- primary intergranular porosity of carbonates is lost during
a- degraded neomorphism b- cementation c- late compaction
19 a fissile mudstone contains two-layers structure clay minerals is
a- illitic shale b- montmorillonitic shale c- kaolinitic shale
20- pelsparrudite and pelmicrite are not included in Folk classification because pellets are
a- without internal structure b- not common c- less than 2 mm

Good Luck

Prof.O.Hegab and Prof.A.Elshahat

Mansoura University
Faculty of Science
Geology Department
Date: 24/6/2010

كلية العلوم
جامعة المنصورة

Second Term Exam (May 2010)
The Second Level (Geophysics)
Subject: Geo (206)
Course: Invertebrate Micropaleontology
Time: 2 hours Full Mark: 60

أجب عن الأسئلة الآتية:

السؤال الأول: أجب عن خمسة فقط (موضح إجابتك فى جدول)

١- صف وإرسم البنيات الرسوبية الأولية المفيدة فى تحديد قمة وقاع الطبقات؟

٢- رتب وحدات الطباقية الزمنية ووحدات الزمن الجيولوجى.

٣- أذكرصور القطاع النموذجى.

٤-أذكرأنواع عدم التوافق موضحة بالرسم.

٥- ماهى الدورات الطباقية.

٦-أذكرالطرق الأولى فى تقدير عمر الأرض بالسنين.

٧- عرف أنواع النطق الحياتية مع التوضيح بالرسومات .

السؤال الثانى: أجب عن أربعة فقط ممايأتى:

١-عرف الطباقية (Stratigraphy) ولخص فى شكل توضيحى تقسيماتها وتطبيقاتها وعلاقاتها بأفرع علوم الأرض المختلفة؟

٢- أذكر كل من خطوات وصف وحدة طباقة جديدة ، وإقرار وملاءمة الوحدات الطباقية الرسمية؟

٣- أكتب نبذة عن طرق المضاهاة الحجرية؟

٤- مستعينا بالرسم عرف كل من المدى الكلى والمدى الجزئى للنوع، ومعايرة مقياس الزمن الجيولوجى بواسطة الأحافير فى القطاعات الطباقية المحلية؟

٥- بالرسم وضح أمثلة لأقسام وحدود الوحدات الطباقية الصخرية.

السؤال الثالث:

أولا: أذكر المصطلح العلمى باللغة الإنجليزية المرادف لكل من:

١- تكوين متجانس من الحجر الجيرى الأسود الذى يتبادل فى تجانس مع طبقات من المارل الرمادى فى منطقة اسمها الأمل.

٢- يشهد عليها تشابه حواف وتتابعات جيولوجيا القارات وتوزيع الأحافير البرية والنباتية و الزحف الجليدى

٣- جسم صخرى رسوبى يعرف وفقا للكود بأنه: ذو تطبق قابل للتخريط يحده حدان من عدم الاستمرارية.

٤- وفقا للكود: وحدة تتكون من صخور نارية متداخلة أو شديدة التحول وهى غير صفائحية و متجانسة وقابلة للتخريط وغير متطبقة ولا تقسم.

٥- نماذج تختار لتحديد حدود الأنظمة والنسق والمراحل على مستوى الأرض يقرها الاتحاد العالمى لعلوم الأرض.

٦- قانون ينص على أن السحنات المتواجدة جانبيا يمكن أن تتعاقب رأسيا.

٧- وحدة أساسية متجانسة صخريا وقابلة للتخريط وذات وضع طباقى.

٨- نفس الوحدة السابقة ولكنها لم يتم تسميتها وفقا للقواعد المعروفة حديثا.

٩- عرفه عالم ألمانى على أنه طبقة أو مجموعة طبقات تعرف بواسطة تجمعات من الأحافير.

١٠- وحدات تشمل فترات غير متساوية فى الزمن تمثل بوحدات متخصصة أو تجمع وحدات

ثانيا: صح أم خطأ:

١- يمكن تطبيق جميع أنواع الطباقية على القمر.

٢- لا يمكن للسحنات المتواجدة جانبيا أن تتواجد نفسها فى القطاع الرأسى.

٣- يهاجر القطب الشمالى المغناطيسى هجرة حقيقية عبر الزمن الجيولوجى.

٤- لا يتغير وضع الطبقات فوق وتحت عدم التوافق المتقطع وعدم التوافق الزاوى.

٥- المتوالية الرسوبية تمثل طبقات غير متوافقة يحدها سطحان من عدم الاستمرارية.

٦- نقطة فى القطاع المرجعى العالمى (GSSP)تعرف بالسعفة الذهبية (Golden Spike).

٧- الليثوديم هو الوحدة الرئيسية من وحدات الصخور المتبلرة عديمة التطبق.

٨- نطاق (Abundance Zone) يعرف بوجود وفرة غير عادية لمصنف حفرى.

٩- صمم الأمريكى ألن شاو تقانة بيانية للمضاهاة الحياتية.

١٠- السنومانى العلوى من وحدات (Chronostratigraphic units) .

لجنة الإمتحان والتصحيح*: أ٠د٠صلاح يوسف البيلى د. حسنى حمدان*

المستوى الثانى - جيوفيزياء

طرق التنقيب التثاقلية (جف ٢٠٠)

Mansoura University Faculty of Science Geology Department Second Term Exam 15/06/2010		Subject: Geophysics (2٠2) كود المقرر(جف٢٠٢) Course: طرق التنقيب التثاقلية المستوى الثانى Time: 2 hours Full Mark: 60

هام: الإمتحان على صفحتين

Q1. A) **Answer with YES or NO (10 Marks)**

1- Gravity method is dynamic method.
2- Bouguer anomalies over oceanic areas are strongly negative.
3- Latitude correction is made to remove the effect of rotation of the earth.
4- In straight-line method for density determination it is assumed that Bouguer anomaly at stations along a line is zero.
5- Anticline has a constant anomaly along the direction of its long axis.
6- Eötvoes balance is used to measures absolute gravity.
7- According to Airy theory, the higher the mountain the shallower will be its root.
8- In density logger method, the amount of scatter radiation is not proportional to density of rocks.
9- Bouguer correction is always opposite to free-air correction.
10- The value of gravity anomaly is affected by the depth of body and its density contrast.

B) **Answer BRIEFLY FOUR questions (10 Marks)**

1- Ambiguity in gravity interpretation.
2- Geologic interpretation of gravity anomalies.
3- Depth of compensation.
4- Effects of simple shape masses.
5- Estimation of depth by gravity method (case of sphere).

Q2. A) **Complete the following (10 Marks)**

1- Terrain correction is made to remove the effect of ..... around the station.
2- The difference between two latitude lines is .....
3- The densities of sedimentary rocks ..... with depth on account of compaction.
4- Cavendish balance is used to measure .....
5- Isostatic anomaly can be deduced by computing the gravity effect from ..... masses.
6- Gravity method measures the change in density of ..... geology.

7- Potential is defined as energy required for gravity to move a unit mass from an ..... reference point to point in question.
8- Gravitational force ..... with latitude.
9- Isostatic anomaly should be ..... if compensation was perfect.
10- Anomalies in gravity which are used in oil exploration may represent only ..... of the earth's total field.

B) Write BRIEFLY on FOUR only; illustrate with drawing (10 Marks)

1- Airy's model for isostasy.
2- Density determination.
3- Estimates of depth and mass.
4- Geoid.
5. Torsion-balance and pendulum gravimeters.

Q3. A) <u>III-Match between (i) and (ii)</u> **(10 Marks)**

1- All geophysical search for oil and mineral	1- on maps by arrows.
2- The denser rocks have	2-called universal constant.
3- In geophysical static method	3-depend directly upon Newton's law.
4- The fluids accumulate in the trap	4- it depends on mass and depth.
5- The theory behind gravitational prospecting	5- approaches to bodies as sedimentary basins.
6- The constant in Newton's law is	6- mirror image for surface topography.
7- Gravity gradient ordinary indicated	7- the greater gravitational attraction.
8- Condensing mass slab to thin sheet,	8- their fields do not vary with time.
9- In gravity method, to reach the final solution of geological shape,	9- depends on a vary physical principles.
10- By applied Airy theory, it is found that Moho acts as	10- according to their relative densities.

B) **Write BRIEFLY on FOUR only, illustrate with drawing** (10 Marks)

1- Gravity profile of horizontal slab shape (Fault on step-like structure).
2- Pratt's theory of isostasy.
3- Worden gravimeter.
4- Adjustment for drift.
5- Factors causing variation of gravity.

مع تمنياتى بالنجاح أ. د. محمد رفعت شريف

لجنه التصحيح : أ. د. محمد رفعت شريف أ. د. عبد القادر زلطة أ. د. حامدالنحاس أ. د. عبد الحميد طه

المستوى الثانى
برنامج جيوفيزياء - زلازل وزلزالية هندسية (جف ٢٠٣)

Mansoura University Faculty of Science Geology Department Second Term Exam 13/06/2010	Subject: Geophysics (203) Course: Earthquakes & Eq Engineering Time: 2 hours Full Mark: 60	كود المقرر(جف203) المستوى الثانى

هام: الإمتحان على صفحتين

Answer these THREE questions: (20Marks for each question)

Q1. Complete: (20 Marks; one for each statement)

1. ..... are a large number of earthquakes that take place within a limited area over a time period from a week to several months without any pronounced mainshock.
2. The ..... discontinuity occurs at the crust-mantle boundary.
3. ..... extends between 100 and 250 km depths where rocks are partially molten.
4. Body waves can propagate in all directions so they are called ..... waves, while surface are called ..... waves as they are always concentrated near discontinuity boundaries.
5. The local earthquakes (recorded at $\Delta \leq 10°$) are dominated by ..... waves.
6. The presence of short-period ..... in the seismogram is a reliable indicator of a very shallow event (h ~ one or a few kilometers).
7. ..... phases are very useful in discriminating nuclear explosions detonated beneath oceanic islands and tectonic earthquakes.
8. ..... is the compressional wave traveling along the Conrad discontinuity.
9. ..... is a depth phase that leaves the focus upward as S, is reflected as P (converted) at the free surface and continues further as Pn along Moho.
10. The distance range ..... is called the shadow zone for P-waves.
11. Amplitudes of LR waves decrease ..... with depth.
12. The Love mantle wave is labeled as ....., while Rayleigh mantle wave is labeled as .....
13. In order to make the seismometer indicate the ground motion accurately, it is necessary that the rate at which the pendulum returns to its rest position be .....
14. The seismic cycle has four basic phases; ....., ..., ..., ...
15. Physical changes in epicentral area before the occurrence of a strong earthquake include ....., ..., ..., ..., ...
16. ..... is characterized by a constant frequency compact surface wave train.
17. t_{PP}-t_P is strongly dependent on ....., while t_{pP}-t_P is strongly dependent on .....
18. The ..... indicates only the occurrence of an earthquake.
19. The ..... earthquakes occur along plate margins, while ..... earthquakes occur within the plate.
20. The amplitude of body waves is ..... proportional to the propagated distance.

Q2. Put Yes or No and correct the underlined word if it is false. (20 Marks; one for each statement)

1. The rupture duration takes a fraction of sec to few seconds, while the seismogram length can extend several hours for distant earthquakes.
2. The attenuation is frequency dependent; high frequencies attenuate rapidly than low frequencies.
3. The seismic waves show an increase amplitude at large distances, this result due to concentration (focusing) of energy.
4. S waves are affected by scattering less than P waves.
5. While Sg arrivals are best recorded on the vertical-component, Rg phases are best recorded on the horizontal-component seismograms.
6. Lg is a short period crustal surface wave of Rayleigh type.

7. The waves traveling to more distant stations penetrate more shallower in the earth than others recorded at short distances.
8. S-waves often have shorter periods than P-waves.
9. SKP is weaker on vertical component than PKS.
10. Love waves can propagate through a thin superficial layer superimpose on a homogeneous half space with velocity in the upper layer lower than in the material below.
11. LQ waves propagate faster than LR waves.
12. Surface waves traveling through layered media often show normal dispersion.
13. The seismometer gives the ground motion as a function of time.
14. Strain seismometers measure the relative displacement of two points in the ground.
15. To detect surface waves, seismographs with free periods about 20 sec are widely used.
16. The Wood-Anderson torsion seismometer uses the dynamic recording.
17. All stylus-type recorders have the disadvantage of friction between the stylus and the drum.
18. For detection of P and S waves, seismographs with free periods about one minute are common.
19. For surface waves, the phase velocity is the velocity with which a wave with a single frequency propagate.
20. For surface waves, the group velocity is the velocity of travel of the wave train envelope.

Q3. Choose the correct underlined word(s) (20 Marks; one for each statement)

1. The velocity of propagation of dispersed waves depends on its (frequency or period or wave length or all of these).
2. The attenuation of seismic energy occurs due to (geometrical spreading or absorption or both).
3. The microseisms interfere with records of (local or distant or both of these) earthquakes.
4. The cultural noise affects records of (local or distant or both of these) earthquakes.
5. Different waves are polarized in a different way, so (P or Rayleigh or both) are best studied on vertical seismograms but (S or Love or both) on the horizontal ones.
6. The seismogram length of (low or moderate or strong) local earthquakes does not exceed 5 minutes.
7. Predominant periods of crustal body waves are normally less than (one or 10 or 20) second(s).
8. For $\Delta < 200$ km, the first arriving phase is (Pg or Pn or Pb) and for larger distances (Pg or Pn or Pb) arrives first.
9. (Pg or P') is the direct compressional wave traveling through the upper crust.
10. (SmS or Sg or S*) is the reflected shear wave from the Moho.
11. (Pg or Pb) is the P- wave traveling along a discontinuity boundary in the granitic layer.
12. When ts-tp is < 20 sec, the first arriving phase is (Pg or Pn or Pb).
13. When ts-tp is > 25 sec, the first arriving phase is (Pg or Pn or Pb).
14. The response of the seismometer is proportional to ground (displacement or acceleration or velocity) when its natural period is long compared to ground motion.
15. The response of the seismometer is proportional to ground (velocity or displacement or acceleration) when its natural period is very short compared to ground motion.
16. The (Moho or Conrad) discontinuity separates the granitic/basaltic rocks within the continental crust.
17. The (upper or lower) mantle includes the lithosphere with about 100 km and the asthenosphere which extends to a depth of 700 km.
18. (The lithosphere or asthenosphere or LVL) extends between 100 and 250 km depths where rocks are partially molten.
19. Seismic velocities increase in the upper mantle with (higher or lower) rate than in the lower mantle.
20. The deep-focus earthquakes have (simple seismograms or impulsive body waves or low-amplitude surface waves or all of these).

مع تمنياتى بالتوفيق أ. د. إبراهيم كرات

لجنة التصحيح : أ.د.زكى زغلول أ. د. عبد القادر زلطة أ. د. حامد النحاس أ. د. ابراهيم كرات*

المستوى الثاني - برنامج جيوفيزياء - طرق التنقيب الكهربية (جف ٢٠٤)

MANSOURA UNIVERSITY
Faculty of Science
Geology Department
Mansoura-EGYPT

Date: Sunday, 20 June 2010
Final semester - Academic Year 2009/2010
Full Mark: 60
Time allowed: 2 Hours- (*13.00-15.00 reading time*)

B. Sc. Exam in Geophysics-204 "جف ٢٠٤" (Electric Methods) for Geophysics Program (Credit Hours Board)

Electric Methods (Relating to material taught by Dr. Mohammed Awad Ahmed)

Instruction: Answer All the following questions: Q1 (17%) (A and B), Q2 (50%) (A and B), and Q3 (33%) (A and B)
In your answers use labeled diagrams and provide specific, named examples wherever possible. No aids allowed.

Q1 (17%): **(10 Marks)**

Q1-A: What these abbreviations mean **(6 Marks)**

1) CST 2) Ms 3) MF 4) VES 5) FE 6) MRT

Q1-B: Which method can be applied in the following cases **(4 Marks)**

1) Detection of saline groundwater 2) Archaeology

3) Disseminated sulphide ore bodes 4) Geothermal

Q2 (50%): **(30 Marks)**

Q2-A: Complete the following **(22 Marks)**

1) The SP filed procedure that keep one electrode fixed at a ... **(1)** ... on ground and to measure the ... **(2)** ... (unit ...**(3)**...) between it and the second one is called the ...**(4)**....

2) The three ways in which electric current can be conducted through a rock are: ...**(5)** ..., ...**(6)**..., and ...**(7)**...

3) The main mechanisms of induced polarization are ...**(8)**... and ...**(9)**....

4) To overcome the electrolytic polarization we use: ...**(10)** ..., ... **(11)**..., and...**(12)**....

5) Self-potentials are generated by a number of natural sources which are ......**(13)**...,...**(14)** ...(...**(15)** ...,... ...**(16)**..., and ...**(17)** ...), and ...**(18)**....

6) The reciprocal of ...**(19)**... is ...**(20)**..., that expressed in ...**(21)**... (Sm^{-1}) or ...**(22)**....

7) The VES quantitative interpretations are: ...**(23)**..., ...**(24)**..., ...**(25)** ..., ...**(26)**... and ...**(27)**....

8) In the Qualitative Approach, If the resistivity of the intermediate layer is greater than the resistivities of the upper and lower layers the apparent resistivity curve is or...**(28)**....

9) The four systems of induced polarization measurement are...**(29)**..., ...**(30)**... , ...**(31)**... and ...**(32)**....

10) The apparent resistivity is the value obtained as the product of a measured ...**(33)**... (units ...**(34)**...) and a ...**(35)**...(units ...**(36)**...) for a given electrode array.

11) In IP survey, the measurement of a decaying voltage over a certain time interval is known as ...**(37)**..., while measurement of apparent resistivity at two or more low AC frequencies is known as ...**(38)**....

12) SP anomalies are often interpreted qualitatively by profile ...**(39)**... , ...**(40)**..., ...**(41)**...(...**(42)**...or ...**(43)**...) and ...**(44)**....

Q2-B: Write briefly on: (**8 Marks**)

1) Equipment used for electrical resistivity surveying (4 Marks)

2) Signal contribution of Schlumberger and Dipole-dipole electrode configuration (4 Marks)

Q3 (33%): (**20 Marks**)

Q3-A: Answer Yes or No (**10 Marks**)

1) In frequency domain IP survey, one measure of the IP effect is the ratio Vp/Vo which is known as the Chargeability, and is usually expressed in terms of millivolts per volt or percent (....)

2) In the Qualitative Approach, If the resistivity of the intermediate layer is greater than the resistivities of the upper and lower layers the apparent resistivity curve is or basin-shaped (....)

3) Time domain IP survey measures the overvoltage as a function of time (....)

4) CST field curves can be interpreted qualitatively using simple curve shapes, semi-quantitatively with graphical model curves, or quantitatively with computer modelling (....)

5) In IP survey, when using a standard four-electrode resistivity spread in a DC mode, if the current is abruptly switched off, the voltage between the potential electrodes does not drop to zero immediately (....)

6) The main application of IP prospecting is in the search for massive metallic ores (....)

7) The electrochemical potential is directly dependent upon the concentration differences and temperature, and consists of Diffusion (Liquid-junction), Nernst (Shale) and Adsorption (Zeta) Potentials (....)

8) In the Square array, if there is a difference in resistivity due to a form of anisotropy the two resistivities will differ (....)

9) The effect of overvoltage increases with increasing porosity as more alternative paths become available for the more efficient ionic conduction (....)

10) In SP interpretation, if the ore body is inclined, the shape of the profile will become asymmetrical with the steepest slope and positive tail both lying on the down-dip side (....)

Q3-B: (**10 Marks**)

1) Compare between (**CST**) and (**VES**) surveying (5 Marks)

2) Illustrate with drawing only the mechanism of (**SP**) and (**IP**) (5 Marks)

BEST WISHES

Level II- Second Term Exam **GPR and Geothermal Exploration** **(205 ج.ف. كودالماده)** **Time allowed 2 hours** **Date 17/06/2010**	**Geology Department**

Answer the following THREE questions:

Q1- Complete the following with the suitable words: (20 Marks one for each)

a) In heat transfer analysis, ...**(1)**... is the thermal conductivity divided by the volumetric heat capacity. It has the SI unit of ...**(2)**...

b) In the simplest of terms, the discipline of heat transfer is concerned with only two things: ... **(3)** ... represents the amount of thermal energy available, whereas ... **(4)** ... represents the movement of thermal energy from place to place.

c) The two uranium and one thorium isotopes decay to stable isotopes of lead, ...eleasing energy in the process.

...**(5)**... = $^{206}Pb + {}^{84}He + 51{:}6$ MeV
...**(6)**... = $^{208}Pb + {}^{64}He + 42{:}6$ MeV
...**(7)**... = $^{207}Pb + {}^{74}He + 46{:}2$ MeV

d) The transition zone is laying between...**(8)**.... and...**(9)**...The sudden changes in seismic velocity in this are more likely related to ...**(10)**...than to changes in the...**(11)**

e) The Moho discontinuity is found between ...**(12)**... and ...**(13)**... and characterized by ...**(14)**...

f) Conduction governs the thermal conditions in almost entire ...**(15)**...of the earth and plays a very important role in the...**(16)** ...
Convection dominates the thermal conditions in the zones where large quantities of ...**(17)**...exist, and thus it governs the heat transport in the ...**(18)**... and the...**(19)**...

g) ...**(20)**...is a vent in Earth's surface that periodically ejects a column of hot water and/or steam

h) Potassium .....**(20)**... is the only radioactive isotope.

Q2- Write short notes on each of the following:

a) Vapor-dominated geothermal system — 4 Marks
b) Geothermal gradient and factors affecting on it — 4 Marks
c) Hot dry rock geothermal system (HDR) — 4 Marks
d) Application fields of GPR and why — 4 Marks

Q3- **20 Marks**

A- Choose the correct answer (10 Marks, 2 Marks for each)

1- The D" is laying between

a) Upper mantle and lower mantle.
b) Crust and upper mantle
c) Outer core and lower mantle
d) Outer core and inner core

2- **The units used for measuring heat flow is:**

a) mW/m
b) mW/m^2
c) m^2W/m
d) mW^2/m

3- **Subduction zones are related to:**

a) Diverging plates
b) Converging plates
c) Transform movements
d) all of them

4- **A low frequency antenna:**

a) will examine the surface at great depths
b) will examine the surface at the near surface in great detail
c) will not used in the GPR system
d) the depth of the subsurface targets is independent of the antenna frequencies.

5) **The electromagnetic velocity in fresh water is:**

a) greater than electrogamnetic velocity in air
b) equal to electrogamnetic velocity in air
c) less than electrogamnetic velocity in air
d) non of them

B- Define each of the following: (10 Marks, 2.5 for each)

a) Relative permeittivity
b) Fumaroles
c) Latent heat
d) Absolute zero
c) Specific heat

لجنة الامتحانات أ.د. حمدي سيسه ، أ.د. عبدالقادر زلط د. مروة أبو الفتوح د. محمد عوض

Best Wishes
Hamdy Seisa

المستوى الثانى

برنامج فيزياء - ضوء فيزيائى (ف ٢٢١)

Mansoura University
Faculty of Science
Physics Department
El-Mansoura Egypt

Second Term Examinations, June , 2010

Subject : Physics — Course ; ٢٢١ف, Physical Optics
Time : TWO HOURS — Full Mark : 80 Marks
Date : 13 / June / 2010

Answer the Following Questions :

1 – a) What is the mean of resolving power of any optical system ? Derive an expression for resolving power of a prism for a parallel beam of light consisting of two wavelengths λ and $\lambda + d\lambda$ when the refractive indices for the material of the prism for that wavelengths are μ and $\mu + d\mu$ respectively.

(14 Marks).

b) suppose a parallel beam of monochromatic light of wavelength λ falls on a plate containing a large number of thin parallel slits, each slits have width a and the distance between adjacent slits is b , . A diffraction pattern will form on a screen . Give a model to explain the formation of this diffraction pattern. Hence derive an Expression of general condition for the bright fringes.

(13 Marks).

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2) Derive an expression for the intensity distribution in a fabry – perot system of interference fringes in transmission when the two coated plate are of same transmission coefficient T and of same reflectivity R . Show that the visibility of intensity distribution does not account for the absorption of the silver layer.

(26 Marks)

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3 –a) Discuss the forming of dark spot in the centre of Newton's rings. Derive the necessary formula of these rings .

(10 Marks)

b) If you have unpolarized monochromatic source and Nicole prism, explain a method to produce a beam of plan polarized light.

(10 Marks)

c) When a very thin plate of glass of refractive index $\mu = 1.54$ is placed into one of the interfering beams, the central light fringe shifts by six fringe width. Find the thickness of the glass plate if the wavelength is 5896 Å .

(7 Marks)

Good Luck
Prof. Dr. Taha Sokkar