٣ جيوفيزياء - إحصاء تطبيقي ٢٠١١

Mansoura University Faculty of science Subject : Applied Statistics		3 year Geophysics Time allowed : 2 hours Total Marks : 80 Date : 18 / 6 / 2011

Answer **All** Questions

[1] The following table shows the number of pieces produced by a factory through a week **(20 Marks)**

Classes	66- 68	69 - 71	72 – 74	75 – 77	78 – 80	81 - 83
No. of pieces	2	6	8	16	5	3

a- Construct the ascending cumulative frequency distribution and plot it, then deduce the values of the quartiles Q_2 and Q_3 from the graph. (8 Marks)
b- Calculate the median and check your result with that obtained in (a). (4 Marks)
c- Calculate mean, standard deviation and coefficient of variation. (8 Marks)

[2] **(20 Marks)**
a- Find Spearman's rank correlation to the following data **(8 Marks)**

X	78	81	85	90	87	75	64	64	60	80
Y	80	94	74	70	75	65	59	62	86	92

and determine its type.

b- Find P(A | B) in the following cases: (12 Marks)
1- If A and B are mutually exclusive.
2- If A and B are independent.
3- If A is subset of B.
4- If B is subset of A.

[3] **(20 Marks)**
a- Let X be random variable with density function **(12 Marks)**
$f(x)= c\,x^2$, $-1 < x < 1$, **then find**
1- the constant c.
2- the distribution function of X.
3- variance of X.
4- P (0 < X < 1), P(X = 0.5) and P (-1 < X < 0.5).

b- Suppose the mortality rate for a certain disease is 0.3 and suppose 8 people in a community contract the disease. (8 Marks)

اقلب الورقة من فضلك

i- What is the probability that

1- fifty percent will die. 2- at most three will die.

ii- Find the mean and the variance.

[4] (20 Marks)

a- A random sample of size 64 is taken from normal population having mean 70 and standard deviation 7. Find $P(|\bar{X} - \mu| \leq 2)$, using central limit theorem. (10 Marks)

b- A random sample of size 50 is taken from population of mean μ_1 has standard deviation 5 and average 80. A second random sample of size 36 is taken from population of mean μ_2 has standard deviation 3 and average 75. Find 95% confidence interval for the difference $(\mu_1 - \mu_2)$. (10 Marks)

$Z_{0.05}=1.65$, $Z_{0.025}=1.96$, $Z_{0.005}=2.58$

$\phi(1.29) = 0.901$, $\phi(3.29) = 0.999$, $\phi(2.29) = 0.989$

مع أطيب التمنيات بالنجاح والتوفيق

د | بيه الدسوقى – د | نورا فخرى

Mansoura University Faculty of Science Physics Department	Geophysics, 3rd Year	2nd Semester, 2010-2011 June, 2011 Time: 2 Hours

Solid State Physics (Ph334)

Final Examination ***(Full mark: 80 degrees)***

Answer the following Question:		*Mark*
1.a)	Complete the following: i) Crystal structure = Lattice + ... ii) ..... is the smallest block from which the crystal is built. iii) All the known types of lattice can be arranged in ..... crystal systems. iv) According to Bravais , there are ..... possible types of space lattice. v) The symmetry elements are: 1- ..... 2- ..... 3-..... vi) Atom migrate from a region of .... concentration to that of ... concentration. vii) This is referred to as .... viii) The two types of dislocations are .... and	*6*
b)	Study in details one type of dislocations.	*7.5*
c)	Find the density of packing for B.C.C, F.C.C and S.C.	*7.5*
d)	Sketch the plans have Miller' indices: (001), (112), (201), (110), (21$\bar{0}$), (231) in S.C .	*6*
2.a)	Prove that the perpendicular distance between adjacent members of the same family {hkl} in S.C = $a/\sqrt{h^2+k^2+l^2}$, where a is the length of the cube edge.	*7.5*
b)	Find the zone axes direction [uvw] if the two planes have Miller indices (134) and (12$\bar{0}$) are in the zone.	*7.5*
c)	A beam of X-ray with λ= 0.842 $\mathring{A}$ is incident on a crystal at angle of 8° 35' when the first – order occurs. Calculate the angle for second order reflection.	*6*
d)	Verify first Fick's law.	*6*
3.a)	Prove that crystalline solids dose not show 5-fold or more than 6-fold symmetry.	*8*
b)	Explain how one determines the activation energy for vacancy formation E_V.	*6*
c)	Study in details one of the experimental diffraction methods.	*6*
d)	If iron has B.C.C lattice structure, it's atomic weight is 55.85 and density 7.86 gm/cm^3, calculate the lattice constant of a unit cell knowing Avogadro's number N_A= 6.02x10^{26} atom/kmole.	*6*

With our Best wishes

Examiners:	*Prof. Dr. A.-R. Degheidy*	*Dr. Safaa Abdel-Maksoud*

المستوى الثالث - فيزيقا - ف ٣٣٣ - فيزياء ذرية

Mansoura University
Faculty of Science
Physics Department

2nd Term Examination
May 2011
Time allowed: 2 hrs

Atomic Physics and Spectra 333 ف

Answer the following questions

1-a) *Starting with* the mass relativistic effect and the general equation of the total energy the elliptical orbits proposed by Sommerfeld could explain the fine structure. Draw the corresponding energy level diagram and the allowed spectral lines. (10 marks)

b) Lyman series contains several spectral lines. Deduce the wavelength in A^{o} and the energy in eV of the spectral line of minimum wavelength of this spectral series. (10 marks)

2-a) Explain the two main concepts of the vector atom model. Discuss L-S coupling and j-j coupling. (10 marks)

b) Estimate the total angular momentum vector **J** of an atom where the orbital angular momentum vector **L** = 3, and the spin angular momentum vector **S** = 2. Comment on the available states. (10 marks)

3-a) *State briefly* the different types of magnetic dipole moments. *Without mathematical derivation*, **Draw** the magnetic splitting of the spectral line from P state (ℓ=1) to S state (ℓ=0). "normal Zeeman effect". (10 marks)

b) Study the spectral series of H atom. Compare it with that of Na atom. Comment on the energy level diagram of the two cases and the corresponding transitions. (10 marks)

($c=3\times10^{10}$ cm/s $h=6.625\times10^{-34}$ J.s $R=1.097\times10^{7}$ m^{-1} $1eV=1.6\times10^{-19}$ J)
($e=1.6\times10^{-19}$ C $m_e=9.11\times10^{-28}$ g)

Best Wishes

Prof. A. El-Khodary

Mansoura University Faculty of Science Geology Department Second Term Exam 18/06/2011		Subject: Geophysics (305) (305جف) كود المقرر المستوى الثالث Course: Paleomagnetism Time: 2 hours Full Mark: 60

I- A) Complete the following: (10 marks)

1. Magnetite has fine particle size, so it has high -------- force.
2. Geothite acquires stable remanence with properties like -------- when heated above 120° and cooled in an ambient field.
3. When the rock temperature is still very close to Tc, the magnetization is -------- to Ha.
4. Usually stability of TRM decreases with -------- grain size.
5. Many of sedimentary and metamorphic rocks in nature have --------
6. Reduction can produce stable chemical remanent by ------ of hematite to magnetite.
7. PRM acquired by application -------- of mechanical stresses in an ambient field at constant temperature.
8. Lava and oceanic sediments show the same -------- sequence of reversals.
9. Host rock provides strong -------- evidence for field reversal.
10. Early and late Paleozoic is characterized by --------.

B) Answer briefly four of the following; illustrating with drawings: (10 marks)

1. Time required for polarity change.
2. Evidence for reversal magnetic field from lava and oceanic sediments.
3. Iron-sulfur group.
4. Baked contact relate to TRM.
5. α–series, with examples of minerals.

II- A) Answer with YES or NO: (10 marks)

1. There is a distinct fall in the CRM intensity during reversal polarity.
2. The fundamental basis of paleomagnetism is stable of TRM of tectonically undisturbed rock unit.
3. Ancient field conforms are made a geocentric dipole.
4. In SQUID device, current flow is independent of the rate of which the specimen is introduced in measuring.
5. k, $\alpha_{45°}$ are used for precision statistical evaluation of paleomagnetic inclination.
6. β–series ranged in composition between magnetite and ulvöspinal.
7. Hematite and ilmenite have cubic structure.

8. The end member in γ–series is rutile.
9. Red sediments acquired post-depositional CRM by dehydration.
10. Polarity inversion has been recorded through geologic time.

B) Write briefly on four of the following; illustrating with drawings: (10 marks)

1. Importance of natural remanent magnetization.
2. Spinner magnetometer.
3. Illustrate the directions of NRM by fold tests.
4. Stepwise heating and cooling method for cleaning.
5. Non-dipole component of the field during a polarity change.

III- A) Match between (a) and (b): (10 marks)

(a)	(b)
1. The measured remanent declination gives the orientation	1. the field direction and represents an instant of time.
2. Field tests of stability of NRM,	2. the environmental noise problem often becomes critical.
3. Thermal cleaning is represented in alternating field method,	3. takes much longer period.
4. The a.f demagnetization system tends to become,	4. does not vanish.
5. A virtual geomagnetic pole is a pole calculated from a spot reading of	5. weak magnetic field.
6. The field intensity during a polarity transition	6. ambient field.
7. Intensity of magnetic change represented in decay and build up,	7. applied as fold test and baked contact.
8. IRM intensity is negligible for,	8. increasing noisy at field order.
9. In most rocks, TRM parallel to,	9. of the site with respect to the pole.
10. For a favorable measurement of specimen,	10. stepwise heating and cooling.

B) Briefly illustrate four of the following; drawings are important: (10 marks)

1. Chronology of the geomagnetic polarity reversals.
2. Intensity of geomagnetic field during a polarity reversal.
3. IRM, PRM and CRM.
4. γ –series with examples of minerals.
5. Direction of remanent vector in rock specimens.

المستوى الثالث - جيوفيزياء جف ٣٠٤ طرق التنقيب الثقلية

Mansoura University
Faulty of Science
Department of Geology

June, 2011
Date: 14 June 2011
Time: 2 hours
Full Marks: 60 marks

2nd term Exam in Seismic Exploration (304 جف)

Answer the Following *THREE* Questions

1) Write on each of the following *(20 marks)*

a) Normal move out (NMO) (7 marks)
b) Common Depth Point (CDP) stack (7 marks)
c) Interval velocity (6 marks)

2) Answer the following questions *(24 marks, 8 for each)*

a) What is the fold coverage? If you have 96 with 4x (geophone intervals) and 2s (shot point intervals), respectively, calculate the corresponding fold coverage?
b) How you could differentiate between different multiples graphically?
c) Why the Dip Move Out (DMO) correction is more expensive than NMO correction? Show how can you do this DMO correction?

3) Write in details on *TWO ONLY* of the following: *(16 marks)*

a) Filtering of seismic data (8 marks)
b) Define the migration of seismic data and write on the tangential method? (8 marks)
c) Amplitude Versus Offset (AVO) (8 marks)

المصححون:
أ.د/ محمد رفعت – أ.د/ حمدى صيصه *

الفرقة الثالثة - جيوفيزياء - جيولوجيا تكتونية ج ٢٠٧

Mansoura University
Faculty of Science
Geology Department
Date: 28 /06/2011

Second Term Exam (May 2011)
Geophysics program Third level
Subject: G 307 Tectonics
Time: 2 hours Full Mark: 60

Answer the following questions

Question 1 20 Marks

a. Write on oceanic - oceanic convergence, continental - continental divergence and transform plate boundaries. Give example of each type. *(6 Marks)*

b. Write on the criteria of continental drift. *(6 Marks)*

c. Define the following: fan structure, Precambrian sutures, thrust duplex, metamorphic core complex. *(8 Marks)*

Question 2 20 Marks

a. Write on the Wilson tectonic cycle and give example for each event. *(8 Marks)*

b. "The pacific Ocean is constituted of several Oceanic sub-plates", explain the tectonic relationships between four pairs of pacific sub-plates. *(12 Marks)*

Question 3 Write short notes on the following 20 Marks

a. The hot spots and its tectonic significance in rotation, convergence, and oblique divergence of the tectonic plates. *(10 Marks)*

b. The Pan-African northward tectonic escape and related structures. *(10 Marks)*

لجنة الممتحنين:

أ.د. عصام الخريبى أ.د. عبد القادر زلطة د. فريد مكروم* د. شعبان مشعل

٣ جيوفيزياء - علم الطبقات المتقدمة (ج ٣٠٣)

Mansoura University
Faculty of Science
Geology Department
Date:21/06/2011

Final Exam. (May 2011)
Third Level (Geophysics)
Subject: Advanced Stratigraphy (G 303)
Course: علم الطبقات المتقدمة
Time: 2 hours Full Mark: 60

Answer the following questions:

Question one: 25 marks

A. Answer with yes or no: (9 marks)

1. Chemostratigraphy is one of newer subdisciplines stratigraphy.
2. The law of Johannes Walther discussed the facies succession.
3. The term "sequence' was introduced by Sloss *et al.* to designate a stratigraphic unit unbounded by subaerial unconformities.
4. The application and definition of sequence stratigraphic concepts are dependent of scale.
5. Bentonites or magnetic polarity boundaries are time markers.
6- Transgressive system tracts are bounded below by underlying sequence boundary and above by maximum flooding surface.
7- Highstand system tracts are bounded below by maximum flooding surface and above by overlying sequence boundary.
8. Joseph Barrell stated the most fundamental events in geologic history- the time-space distribution of deposition and non-deposition.
9. In 1977 Peter Vail and Robert Mitchum published that a seismic reflection surface represents a time line.

B. Define and illustrate the followings: (16marks)

1. Concepts of facies, facies association and facies models.
2. Types of stratigraphy, defined on the basis of the property they analyze.
3. Sequence stratigraphy in the research, integrated data...etc.
4. Sequence stratigraphy and its overlap with sedimentology and context of inter disciplinary stratigraphy.
5. Concept of clinoform.
6. Transition from marine to nonmarine environments.
7. The broad categories of depositional settings.
8. Seismic stratigraphic terminology.
9. Advantages of seismic surveys as an integral part of hydrocarbon exploration.
10. The base level and the two schools of thought regarding its concept.

Question two: (15 marks)

A. Complete the followings: (6 marks)

1. The available sequence stratigraphic literature has focused on ..... &....
2. The main building blocks of the sedimentary record from sequence prospective include.....and.....
3- The science dealing with the study of soil is called.....
4. Geological applications of paleosols include.....,.... and.....
5. The four basic steps in a systematic sequence stratigraphic approach are....,.....and.....
6. The concept of sediment accommodation..... describes .....

Please turn over

لجنة الإمتحان والتصحيح*:

أ.د. حسني حمدان * أ. د.محروس أبو العين

الفرقة الثالثة - جيوفيزياء - جيولوجيا تكتونية ج ٢٠٧

Mansoura University
Faculty of Science
Geology Department
Date: 28 /06/2011

Second Term Exam (May 2011)
Geophysics program Third level
Subject: G 307 Tectonics
Time: 2 hours Full Mark: 60

Answer the following questions

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لجنة الممتحنين:

أ.د. عصام الخريبى أ.د. عبد القادر زلطة د. فريد مكروم* د. شعبان مشعل

B. Write short notes on the followings: (9 marks)

1. Stratigraphic contacts using illustrations?
2. Ichnology as an approach to facies analysis.
3. Types of well logs, their units and geological applications.

Question three: Write short notes on: (20 marks)

a. Stratigraphic procedures. (6 marks)

b. Stratigraphic analysis of sedimentary basins of deposition. (7 marks)

c. Stratigraphic maps.(7 marks)

Prof. Dr. Hosni Hamdan Hamama والله ولى التوفيق