ص ٥٠٤

Mansoura University
Faulty of Science
Department of Geology

Date, 20/08/ 2013
Time allowed: 2 hours
Full Marks: 60 marks

Summer Exam in Geothermal & Radar

Answer the following questions:

First Question: (20 Marks, 5 for each)

Write on each of the following:

a) Geothermal gradient and factors affecting on it
b) Compare between latent heat and specific heat
c) Forms of heat transfer
d) The essential requirements for a geothermal system to exist

Second Question: (20 Marks, 2 for each)

Choose the correct answer:

1- **___ indicates that the core of the earth is a liquid.**
a) Studies of meteorites
b) The S-wave shadow zone
c) The earth's heat flow
d) The P-wave shadow zone

2- **The transition zone is laying between**
a) Upper mantle and lower mantle
b) Crust and upper mantle
c) Outer core and D"
d) Lower mantle and asthenosphere

3- **The units used for measuring thermal conductivity of rocks at normal temperature and pressure is:**
a) W/m °C
b) mW/ °C
c) $m^2W/°C$
d)) $W°C/m^2$

4- **Subduction zones are related to:**
a) Diverging plates
b) Converging plates
c) Transform movements
d) Volcanoes

5- **An opening in earth's crust which emits steam and different gases is known as:**
a) Hot spring
b) Hydrothermal vents
c) Fumaroles
d) Geysers

6- **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) None of them

7- **Oceanic crust is:**
a) Thinner than continental crust.
b) The same thickness as continental crust
c) Thicker than continental crust.
d) The same composition as continental crust.

8- **Paleomagnetism** is the study of the record of the Earth's magnetic field preserved in various _____ minerals through time.

a) Maxwell's equations b) Magnetic field
c) Magnetic m moment e) Electromagnetic

9- **A high 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 be used in the GPR system
d) Depth of the subsurface targets is independent of the antenna frequencies.

10- **The seafloor spreading hypothesis is supported by**

a) Rift valley features b) The age of sediments in relation to the ridges
c) The pattern of magnetic anomalies d) Drilling of the ocean floor

Third Question: (20 Marks, 2 for each)

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

a) Potassium has three isotopes: ^{39}K, ^{40}K, and ^{41}K. Of these, only ^{40}K is radioactive

b) The asthenosphere is the surface that separates the crust from the mantle.

c) In hot water geothermal system, water convection currents carry the heat from the deeper source to the shallow reservoir.

d) $^{235}U = {}^{206}Pb + 84He + 51{:}6$ MeV & $^{238}U = {}^{237}Pb + 74He + 46{:}2$ MeV

e) Microwaves are used in GPR techniques

f) Convergent plates are related to subduction zones

g) Fumarole is a vent in Earth's surface that periodically ejects a column of hot water

h) The Moho discontinuity is found between upper mantle and lower mantle and characterized by increasing in its temperature

b) Temperature is energy which moves from one object to another while heat is the measure of the movement of the molecules inside this body.

j) Hot Dry Rock (HDR) geothermal system usually associated with one or more of fluids

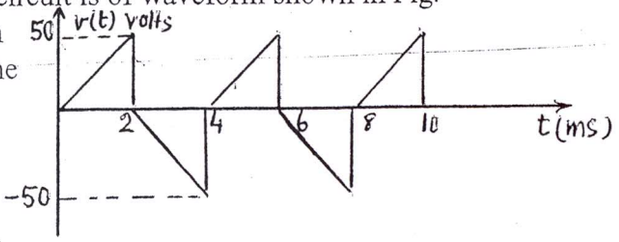
المصحيحون: ا.د. حمدى صيصه – ا.د عبدالقادر زلطه- ازد ابراهيم كرات د. شعبان مشعلل

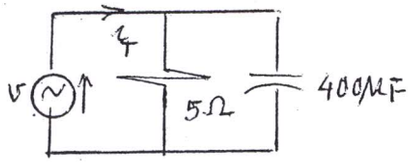
Mansoura University
Faculty of Science
Physics Department

Summer semester 2013
2nd level Ph.228
Electric circuits

Answer the following questions — Allowed time 2h

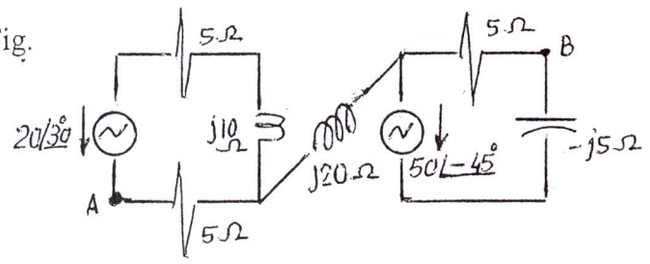
1- The applied voltage to a parallel RC circuit is of waveform shown in Fig.
a- Sketch the total current waveform
b- Determine the average value of the total current



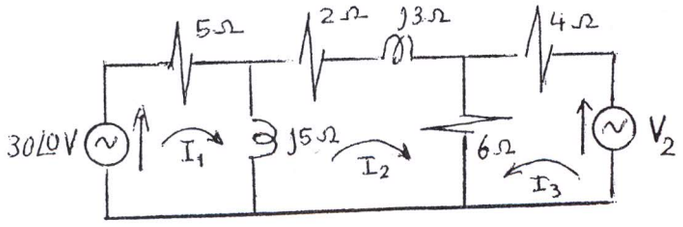


2- a- Discuss the circuit condition at the half-power frequencies f1 and f2 , calculate the bandwidth BW

b- In the circuit shown in Fig. Find the voltage V_{AB}



3- For the selected mesh currents I_1, I_2 and I_3 as shown in the given network determine:
a- V_2 such that the current in (2 + i3) Ω impedance is zero
b- the power supplied by each voltage source
c- the power dissipated in the network



/ ٢٠٦ - رياضيات بحتة . جيوفيزياء

الفرقة: الثانية المادة : رياضيات بحته – ر ٢٠٦ الدرجة الكلية : ٨٠ درجة الشعبة : جيوفيزياء	كلية العلوم – قسم الرياضيات	امتحان الفصل الصيفى الزمن: ساعتان التاريخ : ١٨/٨/ ٢٠١٣

أجب عن الأسئلة الآتية: كل سؤال ٢٠ درجة

[1] أ) اختبر وجود النهايات المتكرره للدالة $f(x,y)=\frac{3x+y}{2x+3y}$ عندما (x,y) تؤول الى (0,0) .

ماذا تستنتج من اجابتك؟

ب) حل المعادلة التفاضلية : $\sqrt{y^2+1}\,dx = xy\,dy$.

---

[2] أ) اذا كانت $z=\sin^{-1}(\frac{x^4+y^4}{5x-3y})$ فاثبت أن $xz_x + yz_y = 3\tan z$.

ب) حل مسألة الشروط الابتدائية

$$(\cos y + 2x\sin y - 4)dx + (x^2\cos y - x\sin y)dy = 0 \ , y(1)=0$$

---

[3] أ) اوجد قيمة التكامل $\iint_R \sqrt{x^2+y^2}\,dx\,dy$ حيث R هي المنطقة المحصورة بين الدائرتين

$x^2+y^2=1 \ , \ x^2+y^2=4$.

ب) أوجد الحل العام للمعادلة : $y' - \frac{y}{x} = -8x^2y^2$

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[4] أ) أوجد التكامل الخطى $\oint_c (x^2-6xy)dx + (y^2+2x^2)dy$ حيث c هو المثلث المحدود بالمستقيمات

$x=0 \ , \ x+y=2 \ , \ y=0$ مأخوذاً فى اتجاه ضد عقارب الساعة.

ب) احسب $\frac{\partial z}{\partial u}$ اذا كانت $z = x\ln y \ , \ x=3u+2v \ , \ y=uv$.

مع أطيب التمنيات بالتوفيق

د/ محاسن موسى

جيوفيزياء - جف ١

MANSOURA UNIVERSITY
Faculty of Science
Geology Department
Mansoura-EGYPT

Date: Sunday, **25** August **2013**
Summer semester –Academic Year 2012/2013
Full Mark: 60
Time allowed: **2** Hours- (*09.00-11.00 AM reading time*)

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

GPHY-201 (Relating to material taught by Prof. Dr. Mohamed Refaat Sherif)

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

Q1: **(20 Marks)**

Q1-A: Complete the following **(11 Marks)**

1) P-waves has velocities ..... than S-waves.
2) Fault plane can be detected from the ..... motion of the P-wave.
3) The geomagnetic field ..... with depth.
4) The symbol of magnetic method is .....
5) The velocity of seismic waves ..... with depth.
6) The residual methods are used to detect..... structure.
7) ..... is located indirectly by radiation.
8) The gravity and magnetic fields are ..... methods.
9) In radioactive method, the ..... are stopped by very small thickness matter.
10) Refraction method are applied to determine ..... depth.
11) The presence of fluids in an unconsolidated rocks causes..... in electric resistivity.

Q1-B: Answer BRIELY on **THREE** of the following: (support your answer with drawing) **(9 Marks)**

1) Interpretation of magnetic data and Peter's method
2) Elements of earthquake, seismograph, seismogram and location of epicenter.
3) Geological examples from electrical prospecting.
4) Instruments for gravity measurement.
5) Density determination.

Q2: **(20 Marks)**

Q2-A: Compare between **FOUR** of the following: **(8 Marks)**

1) Aeromagnetic method and ground magnetic method.
2) Travel-time curves in both seismic refraction and seismic reflection.
3) Wenner method and Schlumberger method in electrical prospecting.
4) Density determination by direct method and indirect method.
5) Second vertical method and downward continuation method.

لجنة الامتحان و التصحيح * |ا.د. محمد رفعت شريف*-ا.د.محمود قورة -ا.د. ابراهيم كرات- د.محمد عوض.

Q2-B: Match between A and B: **(12 Marks)**

Theme		**Option**	
1	The magnetic inclination angle increase	A	Detect anomalies in the electrical properties of rock
2	Griffen method is considered	B	Variation with terrain
3	Telluric current method	C	Acquiring permanent magnetization
4	Graphical method is sometimes	D	In seismic prospecting
5	The gravitational field is	E	From equatorial to pole
6	Ferromagnetic substances are capable of	F	As direct computation of residual
7	Compressional waves are used	G	Uses natural earth current
8	Electrical methods are used to	H	Known as regional correction
9	The amplitude of motion of Rayleight waves decrease	I	Of earth because they are not pas in core
10	The γ rays can be used in the search for	J	Is constant altitude above sea level
11	In aeromagnetic survey for oil the height of the flight is	K	Radioactive element in the earth's crust
12	Secondary waves are important in study the structure	L	Exponentially with depth below the surface

Q3: **(20 Marks)**

Q3-A: Answer Yes or No **(11 Marks)**

1) The vertical magnetic field is taken positive downwards and negative upwards.
2) There is no abrupt change of the earthquake wave velocities at the earth crust-mantle-core boundaries.
3) Resistivity method is used for detecting nonlinear structural types.
4) Seismic method of prospection is considered as static methods.
5) The configuration of the basement is determined by the vertical magnetic component.
6) The Bouguer correction is always opposite in sign to the Free-air correction.
7) The number of segments in travel-time curve is equal to the number of beds.
8) In seismic prospecting the quantities which are measured are distance and time.
9) In gravity prospecting, we use absolute density value.
10) The diamagnetic rock has negative susceptibility.
11) In Wenner method, the distances between electrodes are not equal.

Q3-B: BRIEFLY explain **THREE** of the following: **(9 Marks)**

1) Petroleum is found at the crest of the anticline.
2) For measuring magnetic anomalies, Shemidt type magnetometer put parallel to earth's magnetic field.
3) Gravity and magnetic methods are static methods.
4) In any observatory there are three seismographs.
5) Bouguer correction is subtracted from reading of instrument for high places upon sea-level.

BEST WISHES

جيوفيزياء جف ٢٠٧

Mansoura University Faculty of Science Geology Department Summer Exam 25/08/2013		Subject: Geophysics (203) (جف 203)كود المقرر Course: Earthquakes & Eq Engineering المستوى الثانى Time: 2 hours Full Mark: 60

هام: الإمتحان على صفحتين

Answer these Two questions: (30 Marks for each question)

Q1. Complete: (30 Marks; one for each statement)

1. ------- is the shear wave reflected from the outer core boundary to the mantle and converted to compressional wave.
2. ------- is a depth phase compressional wave (short leg), then long leg P within the mantle, converted to S-wave when reflected at the free surface.
3. ------- is a P-wave reflected from a discontinuity boundary at a depth of 650 km and converted to S-wave.
4. ------- is the shear wave traveling along the Conrad discontinuity.
5. ------- is a S-wave in the mantle, converted to P-wave in the outer core, P in inner core, P in outer core, P in the mantle.
6. The distance range ------- is called the shadow zone for S-waves.
7. ------- phase is characterized by a constant frequency compact surface wave train.
8. The Love mantle wave is labeled as -------, while Rayleigh mantle wave is labeled as-------
9. To detect surface waves, seismographs with free periods about ------- seconds are widely used.
10. Earthquake risk is defined as -------
11. For surface waves, the phase velocity is defined as -------
12. Amplitudes of direct P-waves are highly decayed beyond -------
13. The distance range ------- is called the shadow zone for P- waves.
14. The seismometer indicates clearly ground motion with periods ------- compared with its natural period.
15. The response of the seismometer is proportional to ground acceleration when its natural period is very ------- compared to ground motion.
16. The --------- indicates only the occurrence of an earthquake.
17. The seismic cycle has four basic phases; -------, -------, -------, -------
18. ------- phases are very useful in discriminating nuclear explosions detonated beneath oceanic islands and tectonic earthquakes.
19. The -------- extends between 100 and 250 km depths where rocks are partially molten.
20. Earthquake effects include primary effects as --------, secondary as ---------, and tertiary ones as --------.
21. The ------- earthquakes occur along plate margins, while ------- earthquakes occur within the plate.
22. ------- are a large number of earthquakes take place within a limited area over a time period from a week to several months without any pronounced mainshock.
23. The ------- extends between 100 and 250 km depths where rocks are partially molten.
24. Seismic velocities increase in the upper mantle with ------- rate than in the lower mantle.
25. Physical changes in epicentral area before occurrence of a strong earthquake include , -------, -------, -------, -------, -------
26. The attenuation is frequency dependent; ------- frequencies attenuate rapidly than ------- frequencies.
27. ------- is the direct compressional wave traveling through the upper crust.
28. ------- is the compressional wave traveling along a discontinuity boundary in the granitic layer.
29. ------- is a depth phase that leaves the focus upward as P, is reflected as S (converted) at the free surface and continues further as Sn along Moho.

30. When ts-tp is between -------- sec, the first arriving phase depends on the crustal structure and focal depth.

Q2. Put Yes or No and correct the underlined word if it is false: (30 Marks; one for each statement)

1. PKIKS is is a P-wave in the mantle, P-wave in the outer core, converted to S in inner core, converted to P in outer core, converted to S in the mantle.
2. Earthquake foci may be shallow, intermediate or deep but the most dangerous are deep earthquakes.
3. The amplitude of body waves is inversely proportional to the propagated distance.
4. The velocity of propagation of scattered waves depends on its frequency.
5. Body waves traveling through layered media often show normal dispersion.
6. The seismic waves showing a decrease amplitude at large distances, due to concentration (focusing) of energy.
7. T waves are best recorded by ocean-bottom seismometers (OBS).
8. The cultural noise has dominant frequencies above one Hz.
9. It is generally accepted that compressional waves cease to exist at the outer core depth due to its fluid character.
10. S waves are affected by scattering less than P waves.
11. Sb is the shear wave traveling along the Moho boundary.
12. The dilatancy begins when the stress reaches about half the breaking strength of the rock.
13. SKP is weaker on vertical component than PKS.
14. The amplitude of surface waves is inversely proportional to the square root of the propagated distance.
15. SPn 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.
16. Amplitudes of surface waves decrease exponentially with depth.
17. LQ waves propagate slower than LR waves.
18. tPP-tP is strongly dependent on depth, while tpP-tP is strongly dependent on focal distance.
19. 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 very fast.
20. pSn is a depth phase that leaves the focus upward as P, is reflected as S (converted) at the free surface and continues further as Sn along Moho.
21. The cultural noise affects records of near (local) earthquakes.
22. The common microseismic noise has periods of about six sec.
23. The microseisms interfere with records of distant (teleseismic) earthquakes.
24. SSn is a depth phase that leaves the focus upward as S, is reflected as S at the free surface and continues further as Sn along Moho.
25. All stylus-type recorders have the disadvantage of friction between the stylus and the drum.
26. For detection of P and S waves, seismographs with free periods about one minute are common.
27. For surface waves, the group velocity is the velocity of travel of the wave train envelope.
28. Strain seismometers measure the relative displacement of two points in the ground.
29. The short-period S waves multiply reflected between the free surface and Moho interfere with each other and give rise to a wave group labeled Rg.
30. Different waves are polarized in a different way, so P and Rayleigh are best studied on horizontal seismograms but S and Love on the vertical ones.

لجنة التصحيح: أ. د. عبد القادر زلطة أ. د. عادل جنيدى أ. د. ابراهيم كرات* د. شعبان مشعل

Mansoura University
Faculty of Science
Department of Geology

2nd Level, Geology & Geophysics students
Summer Exam, Academic Year 2012-2013
Optical Mineralogy & Rock Forming Minerals (G202)
Date: 22/8/2013, Time Allowed: 2 HOURS
Total mark: 70 marks

أجب عن الأسئلة الآتية

السؤال الأول: أكمل مكان الفراغات: (20 درجة)

1-التغير اللونى فى المعادن أحادية المحور يظهر.....بينما فى المعادن ثنائية المحور يظهر.....

2-مجسم معاملات الانكسار أحادي المحور عبارة عن.....مقطعه الاستوائى.....

3-تختلف المواد فى قوة تفرقها للضوء اختلافا كثيرا، فمعدن ..... من أقل المعادن قوة على التفرق ولهذا يستعمل فى صناعة ..... أما معدن ..... فمن أكبر المعادن قوة على التفرق ولهذا السبب يعزى .....

4-طرق قياس معامل الانكسارهى.....،.....،.....،.....

5-الغرض من منشورا نيكول الحصول على ضوء.....

6-يسمى المستوى المار بالمحور البلورى (ج) لبلورة الكالسيت والذى يشمل القطر الصغير لسطح الانفصام المعينى العلوى .....

7-للبلورات أحادية المحور ..... ويتبين ذلك من وجود ..... لهما .....

8-فى الاختبارات الأرثوسكوبية.....بينما فى الاختبارات الكونوسكوبية.....

9-المواد الأيزوتروبية هى التى تنتقل فيها موجات الضوء.....

10-تتوقف تضاريس المعدن وكذلك وضوح حدوده على الفرق بين.....

السؤال الثانى: (20 درجة)

1- تكلم عن الانكسار المزدوج وتجربة الكالسيت (وضح بالرسم).

2- كيف تفرق بين صور التداخل أحادية المحور المركزة وغير المركزة (وضح بالرسم).

3- كيف تفرق بين مجسم معامل الانكسار الأيزوتروبى ومجسم معاملات الانكسار غير الأيزوتروبى أحادى المحور (وضح بالرسم).

4- How to differentiate between single chain silicates and phyllosilicates (illustrate with drawing).

5- What are the common ions in the earth's crust?

6- How to differentiate between nesosilicates and double chain silicates (illustrate with drawing).

فضلا اقلب الورقة

Mansoura University
Faculty of Science
Geology Department
Date: 22/08/2013

Summer Term Exam. (August 2013)
Second Level (Geolophysics)
Course No. G205
Course: Sedimentation & Sedimentary Rocks
Time: 2 hours Full Mark: 60

Answer the Following Questions

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

1. Graded bedding is characteristic structure of sandstones.
2. Sparry calcite is the normal cement in carbonate mudstone.
3. All sedimentary rocks are clastic.
4. Aragonite is the chief constituent of old limestones.
5. The classification of clastic sedimentary rocks is based on mineral composition.
6- Travertine is a typical marine carbonate rock.
7- In all methods of porosity measurement the total porosity is measured.
8- Pellets are distinguished from oolites by their concentric structure.
9- In a steady flow (T) is highest at the free surface.
10- Micritization is an example of degrading neomorphism.
11- The head of cross-bedding points to downstream direction.
12- Biomicrudites indicate a gravel-sized fossil allochems and micrite matrix.
13- Imbrication is a primary sedimentary structure found in the arenaceous rocks.
14-Most shells of marine organisms are composed of calcium sulphates.
15- Permeability of clastic sedimentary rocks is dependent on total porosity.
16-Sparry calcite is the normal cement in wackestones.
17-Arkosic sandstone is less mature than quartz arenite.
18-Phosphate rocks are typically accumulated in shallow seas.
19- Sandstone contains more polycrystalline quartz grains is less mature.
20-The BTU of anthracite is 12000.

(20 marks)

Question Two: Complete

1-The texture of clastic sedimentary rocks deals with.....and.....
2- Biomldic and oomoldic porosities suggest .....of allochem elements
3- The distance of transport is translated in sediment by.....and.....maturities.
4- Effective porosity is economically more important than.....porosity.
5- Bedload of clastic sediments is transported by.....and.....
6- Sparitization is an example of..... neomorphism.
7- Cross-bedding is measured in the field in.....,.....and.....
8- Mud-supported limestones include mudstone and.....
9- The clastic sediment grains are moved by.....,.....and.....
10- Aragonite and..... .represent the constituents of the early deposited carbonates
11- The permeability of sedimentary rocks is directly proportional to.....porosity.
12-Folk s classification of carbonates depends on the percentages of.....,.....and.....
13- The matrix of sediments is ..... from source rocks while cement is ..... in situe.
14- Diminution of sparite crystals is an example of.....neomorphism.
15- Lithic greywacke is a sandstone rich in.....and.....
16- Aragonite and high Mg-calcite are inverted to.....in older carbonates.
17- Because impact breccia is deposited on or near the source its grains are always.....
18- The chief constituent of chert is the mineral.....
19- The sabkha sequence is either.....or.....
20- The sequence precipitation from sea water by evaporation is.....,.....,.....,then.....

(20 marks)

اقلب الصفحة

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

Question Three: Choose the correct answer :

1 - Chemical weathering is not dependent on the presence of
a- heat b- water c- biogenic agents

2- Which of the following is not biochemical rock
a- phosphate b- shale c- coal

3- Which of the following rock is composed of clay sized clastic sediments
a-sandstone b-dolostone c-shale

4- Which of the following porosity is not primary
a- intra granular b-inter granular c- intercrystalline

5- Which of the following is not sedimentary structure
a- foliation b- imbrication c- lamination

6- Grainstone include both
a- wackestone&packsone b-boundstone&mudstone c-calcarenite&calcrudite

7- Which of the fillowing mineral will be least affected by chemical weathering
a- amphiboles b-muscovite c- quartz

8- The process whereby dissolved matter precipitates in the pore spaces of asediments is
a- weathering b- compaction c- cementation

9- Which clastic rock would expect to have been deposited by turbulent flow
a- conglomerate b- sandstone c- mudstone

10- A limestone with mud supported texture is
a- wackestone b-packstone c- grainstone

11- The effect of rubbing one pebble against another is
a-abrasion b-impact c- grinding

12-A rock formed by replacement in carbonate rocks is
a- limestone b- dolostone c- ironstone

13- Match the sedimentary rock type arkose with the feldspar percent
a- 25% b- 5% c- 50%

14- Limestone with sand size>25% bioclast, <25% oolites and <25% pellets cemented by micrite is
a- biomicrite b- biopelmicrite c-bioopelmicrite

15-Which of the following correctly describes the process that occurs during diagenesis
a- lithification b-partial melting c-metasomatism

16-sandstone contains<10% matrix, 5% feldspars and> 50% rock fragments is
a-lithic arenite b- lithic wacke c- subarkose

17- Pure chemically precipitated carbonate rock is
a- tufa b- wackestone c- calcarenite

18- The main mineral constituent of phosphate rock is
a- calcite b- apatite c-aragonite

19- Lignite is an organic rock containing
a-50% C b-60% C c-80% C

20- The most common evaporate mineral in the coastal depressions is
a- natrun b- halite c-sylvite

(20 marks)

Good Luck