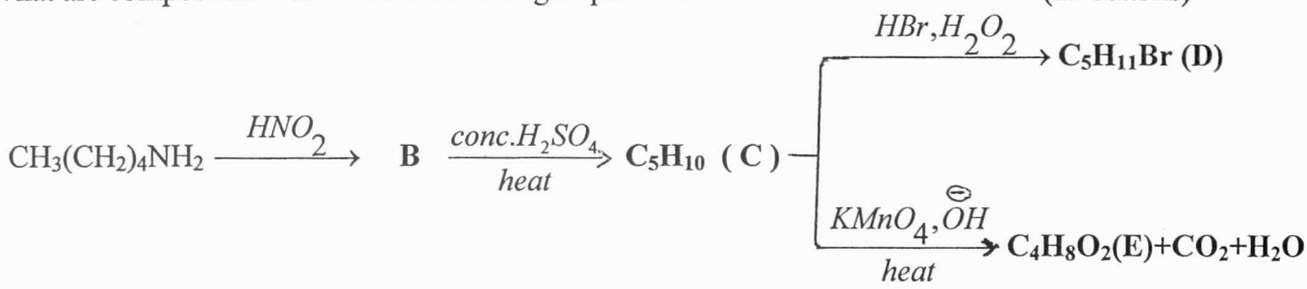
Mansoura University **Faculty of Science** **Chemistry Department** **Subject: Chemistry** **Course(s):** Org. Chemistry 236	كلية العلوم جامعة المنصورة	**Second Term** **2nd LEVEL Students.** **Date : May 2010** **Time Allowed: 2 hours** **Full Mark: 80 Marks**

ANSWER ALL QUESTIONS

1. A) What are compounds **B** to **E** in the following sequence : **(12 Marks)**

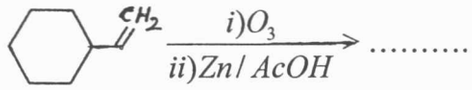


B) Compare between the following pairs of compounds as the case specified (give reason): **(15 Marks)**

i) Acetic acid and chloroacetic acid (acidity)
ii) 2-Chlorobutane and isobutene (optical activity)
iii) Benzylamine and N-methylbenzylamine (Hinsberg test)
iv) Benzoyl chloride and acetamide (reactivity towards water)

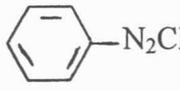
2. A) On chlorination of propane it was found that the reactivity ratio between 1°:2° H-atoms is 1:3.25
Calculate the percentage of each isomer **(7 Marks)**

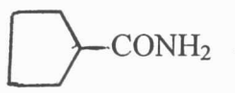
B) Predict the product(s) : **(14 Marks)**

i) 

ii) 2-butene $\xrightarrow[CCl_4]{Br_2}$ .....

iii) EtOOC—≡—COOEt $\xrightarrow{H_2/Pt}$ .....

iv)  $\xrightarrow{CuBr}$ .....

v)  → $\xrightarrow{Ac_2O,heat}$ ..... $\xrightarrow{LiAlH_4}$ .....

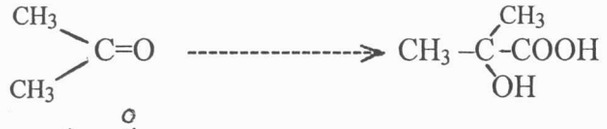
$\xrightarrow[NaOH]{Br_2}$ .....

C) Deduce the structures of the following compounds that give only monochorination product :
C_6H_{12}, C_5H_{12}, C_8H_{18} **(6 Marks)**

3. A) **(12 Marks)**

i) Draw the cyclic structure of glucose
ii) What is ment by mutarotation ?
iii) Why glucose and fructose give the same osazone ?
iii) Give the products of both mild and strong oxidation of glucose

B) Show how the following conversions could be affected : **(14 Marks)**

i) 

ii) 

iii) Fructose ----------> glucose

iv) glucose ----------> n-hexane

v) 

vi) 

vii) 

****

Mansoura University
Faculty of Science
Chemistry Department
Course: Physical Chemistry
Date : 15/ 06/ 2010

Second term Examination
Subject: Chemistry (241)
Second level
Full Mark : 60 Marks
Time Allowed : 2hours

Answer the Following Questions:

I)-Choose the response that best complete each statement giving reason: (2.5 marks for each one)

You must explain your reasoning to get credit for your answer

1- In which process is the system entropy increasing?

I. Expansion of a gas into a vacuum. II. Vaporization of a liquid.

III. Precipitation of a solid from solution

a) all of them b) only II and III c) only I and III d) only I and II e) only III

2- Which of the following statements regarding the third law of thermodynamics is **INCORRECT**?

a) Pure substances have positive absolute S at $T > 0$ Kelvin.
b) The absolute S is greater at 300 K than 100 K for a given substance.
c) The absolute S is zero at 0 Kelvin.
d) The absolute S at 298 K can be positive or negative.

3- The equilibrium constant for a chemical reaction will be equal to one (1) under which one of the following conditions? a) $\Delta H^\circ < 0$ and $\Delta S^\circ = 0$ b) $\Delta H^\circ = 0$ and $\Delta S^\circ = 0$
c) $\Delta H^\circ < 0$ and $\Delta S^\circ > 0$ d) $\Delta H^\circ > 0$ and $\Delta S^\circ < 0$

4- Identify the INCORRECT statement below:

a) In spontaneous changes the universe tends toward a state of greater disorder.
b) The Gibbs free energy of a system is increasing in any spontaneous process at constant T and P.
c) The entropy of a pure, perfect crystal at $T = 0$ K is zero.
d) The entropy of a system can decrease in a spontaneous process, if the surrounding entropy is increasing even more.

5- Which of the following quantities can be determined directly from the slope of a ln P versus 1/T representation?

a) Equilibrium constant. b) Molar volume in gas phase.
c) Temperature of boiling d) Enthalpy of vaporization

6- Which of the following liquids is likely to have the highest value for S°?

a) N_2H_4 b) H_2O c) C_2H_5OH d) CH_3OH

7- The total entropy change for the reversible expansion of an ideal gas is:

a) Positive b) negative c) zero d) impossible to tell

8- Under what circumstances will ΔG for a chemical reaction always be positive?

a) An endothermic reaction that generates fewer moles of gaseous products than gaseous reactants.
b) An exothermic that generates solids from liquid reactants.
c) An exothermic reaction that generates fewer moles of gaseous products than gaseous reactants.
d) An endothermic reaction that generates more moles of gaseous products than gaseous reactant.

9- $\Delta H° = -92.5$ kJ for the following reaction: $PCl_3(g) + Cl_2(g) \rightarrow PCl_5(g)$ This reaction is most likely to be

a) spontaneous at all temperatures
b) spontaneous at high temperatures but nonspontaneous at low temperatures
c) spontaneous at low temperatures but nonspontaneous at high temperatures
d) nonspontaneous at all temperatures

10- For the adiabatic compression of a gas, which is true?

a) $q = 0$ and $\Delta U > 0$ b) $q > 0$ and $\Delta U = 0$
c) $q = 0$ and $\Delta U < 0$ d) $q < 0$ and $\Delta U = 0$

11- . The value of q for an isothermal ideal gas system when work is being done on that system is: ----------

a) positive b) negative c) zero d) impossible to tell

12- For isothermal irreversible expansion of an ideal gas the work done is given by .

a) $W = nRT \ln P1/P_2$ b) $W = -\Delta U$
c) $W = nRT (1-P_2/P_1)$ d) none of these answers

13- The heat capacity at constant volume is _____ the heat capacity at constant pressure for an ideal gas:

a) greater than b) less than c) the same as d) cannot determine

Answer the following Questions: (6 marks for each one)

II) 1) One mole of ideal gas at 27 °C and 100 bar is allowed to expand reversibly and isothermally to 5 bar. Calculate the amount of heat adsorbed.

2) Calculate the equilibrium constant for the reaction

$$\frac{1}{2} N2 (g) + 3/2 N2 (g) \rightarrow NH3 (g)$$

given that the enthalpy and entropy changes at 298 K are –46.2 kJ and –99.2 J/K, respectively.

3) An ideal heat engine is run between two temperatures of 550 K and 275 K. Calculate the Carnot efficiency for this heat engine.

4) Calculate the change in entropy of the system, ΔS, and the change in entropy of the surroundings, ΔS_{surr}, when one mole of an ideal gas is expanded isothermally and reversibly from a pressure of 5.0 bar to 1.0 bar at 300 K. What is the entropy of the universe?

5) Prove the relationship of Free Energy and Equilibrium constant

---

GOOD LUCK,

Examiners: Prof. Dr. Awad I. Ahmed, Dr. A.S. Khder and Dr. A.M. Ouf

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

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

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

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*

الفرقة الثانية - جيولوجيا - (ج ٢٠٧) - صخور نارية

Mansoura University
Faculty of Science
Geology Department
Date: 27/ 6 / 2010
Time: 2 hours Full Mark: 60

Second Term Exam June 2010
Second Level
Program: Geology
Subject: 207 ج
Course: Igneous rocks

ANSWER THE FOLLOWING QUESTIONS (20 MARKS For Each)

Question One: (20 Marks)

A- Complete the following: **(6 Marks)**

i- Heat resources are ....., ... and ..... .
ii- Melanochratic rocks include more than ..... % mafic minerals.
iii- Basaltic magma can generate from ..... and erupted either as ..... or ..... .
iv- Fictional heating can produce at ..... zone
v- Factors that can stop mixing of two magmas are: 1- ....., 2- .....
3- ..... and 4- ..... .
vi- Example of intergrowth textures are: ..... , ... , ..., ..., and .....

B- Write on the behaviors of REE during the various degrees of fractional crystallization. **(7 marks)**

C- What are the effects and the relation between rate of cooling, nucleation rate and the rate of growth of crystals. **(7 marks)**

Question Two: (20 Marks)

A- Complete the following: **(5 marks)**

i - Oversaturated rocks have enough silica to form free .....mineral.
ii- Alkaline rocks are rich in ..... and ..... oxides.
iii - Factores that determine the textures of igneous rocks are : 1- .....
2-..... 3- ..... and 4- .....
iv- According to the grain size of the crystals, the rocks are described as .....,
..... , ..., ..., and ..... .
v- According to alumina saturation, igneous rocks are classified as, ... , ...and .....

B- Answer using (√ or X). **(7 Marks)**.

i- Partial melting of upper mantle can be activated by frictional heat.
ii- Isotopes of element like Rb and Sr indicate crustal contamination of magma.
iii- Granitic magma can be generated from lower crustal matter of the earth.
iv- Incompatible elements include: Rb, Sr, K, REE, Cr, Ni, Co, Zr, Pb and Hf.
v- Intergrowth textures are like: ophitic, subophitic speheriolitic and graphic textures.
vi- According to the shape of crystals, they are described as, platy, tabular, acicular, aphanitic and phanaritic.
vii- undersaturated rocks contain nepheline and/or olivine in their composition.

C- What are the types of volcanoes. (Answer with drawing). **(8 Marks)**

Question Three: (20 Marks)

A- Write on decompression due to convection. **(7 Marks)**

B- Answer using (√ or X). **(5 Marks)**

i- The ultramafic rocks are rich in Mg and Fe like peridotite and diorite.
ii- Saturated rocks contain just enough silica to form opx, cpx and olivine, but no quartz and no nephiline.
iii- Heat transfere are due to radiation, conduction and convection.
iv- explusive magmas are favored by low gasses and low viscosity.
v- Grain size of the rocks is affected by the rate of cooling, and growth rate.

C- Write on the mechanisms of crystal fractionation. **(8 Marks)**

لجنة الإمتحان والتصحيح*:

أ.د أحمد عبد اللطيف* - أ.د. زكى زغلول - أ. د. محمود الشربينى - أ.د. عبد القادر زلطة

Mansoura University
Faculty of Science
Geology Department
Date: 13/6/2010

كلية العلوم
جامعة المنصورة

Second Term Exam (May 2010)
The Second Level (Geology)
Subject: Geo (208)
Course: Invertebrate Micropaleontology
Time: 2 hours Full Mark: 60

Answer the following Questions: **(20 Marks for each one)**

Question One: Complete the following statements: (20 Marks)

- Foraminifera are usually scarce in ....(1).... but they are often abundant in ....(2).... especially if glauconitic.
- In Foraminifera,the most structures occur in the ....(3).....
- In ....(4)...., the successive chambers spiral about the growth axis of the test, all the ....(5).... pointing in the same direction.
- Dimorphic pairs are found among ....(6).... foraminifera, but have not been recognized in ....(7).... genera.
- The test of Allogromiids is unilocular, thin and flexible as in .....(8)....
- The annular discoidal "equatorial" layer and layers of lateral chamberlets on each side, giving a generally flattened spheroidal shape as in ....(9)....
- The planktonic Globotruncanidae became extinct at the end of ....(10)....
- *Nummulites gizehensis* is so- abundant in the ....(11).... of the Sahara especially from the ....(12).... of the Great Pyramids in Egypt.
- The tropical genus.... (13).... is belonging to Rotalicea in which the trochospiral test bears robust spines from a thick outer wall.
- The young gamots with the larger proloculus are termed the ....(14).... generation, while the individuals with smaller proloculus are called the .....(15).... generation.
- The test may be described as monoumbonate as in ..(16).. or biumbonate as in ....(17)....
- There are genera ....(18)...., ...(19).... and ....(20).... in which a third generation commonly occurs, which is called A1, the second megalospheric generation.

Question Two: Answer the following statements with Yes or No and correct the false one.
(20 Marks)

1- Larger foraminifera can be collected in the field like other macroscopic invertebrate fossils as in the case of lageniids.
2- In advanced foraminifera such as the ammodiscacids, the organic layer becomes an inner lining to the calcareous test.
3- Among some foraminifera there is this same alternation of sexual followed by asexual generation.
4- The two morphologically distinct tests are termed trimorphism.
5- The microspheric generation with the smaller proloculus is termed A form, whereas the megalospheric phase (with larger proloculus) is called the B form.
6- Rapid appearance of planktonic Globigerinidae and Globorotalidae in Cretaceous.
7- The biserial arrangement of chambers arranged in two alternating rows, the initial test may be calcareous as *Textularia* or agglutinated as in *Bolivina*.
8- The shape of the aperture may be toothed as in *Textularia*.
9- All planktonic foraminifera have calcareous test.
10- The *Heterohelix* is considered as benthic of agglutinated test.
11-The benthic genus *Rosalina*, reproduce only asexual in culture.

Question Three: Write the main characterstics of the following superfamilies (Give an example for each one)

1- Superfamily Ar...

المستوى الثاني برامج (ك - ك ح - ك ن - ك ع ب - ميكرو - ك ع ح - علوم بيئة - ج)
رياضيات بحتة (ر ٢٠١)

الفرقة: الثانية المادة: ر ٢٠١ – رياضيات بحتة (تفاضل عالي ومعادلات تفاضلية)	كلية العلوم – قسم الرياضيات	دور مايو ٢٠١٠ الزمن: ساعتان التاريخ: ٢٠١٠/٦/١٧

الشُعب: كيمياء-كيمياء حيوية-كيمياء ونبات-ميكروبيولوجيا-كيمياء وحيوان-علوم البيئة -جيولوجيا

أجب على الأسئلة الآتية: (٢٠ درجة لكل سؤال)

[1] أ اختبر وجود النهايات المتكررة و النهاية العامة للدالة $f(x,y)=\dfrac{x^2-y^2}{x^2+y^2}$، وذلك عندما $(x,y)\to(0,0)$

ب. باستخدام نظرية أويلر للدوال المتجانسة اثبت أنه إذا كانت $u(x,y)=\tan^{-1}\left(\dfrac{x^3+y^3}{x-y}\right)$

، فإن: $x u_x + y u_y = \sin 2u$.

[2] حقق نظرية "جرين" للتكامل: $\oint_c (x^2-y)\,dx+(x-y^2)\,dy$ حيث c هو المنحنى المحصور بين المستقيم $y=x$ و القطع المكافئ $y^2=x$ مأخوذاً في الاتجاه ضد عقارب الساعة .

[3] أ. إذا كان $I_n=\int_0^{\pi/2}\sin^n x\,dx$ ، فاثبت أن: $I_n=\dfrac{n-1}{n}I_{n-2}$, $(n=2,3,4,\ldots)$ ،

ومن ثم استنتج قيمة التكامل: $\int_0^{\pi/2}\sin^6 x\,dx$.

ب. حل مسألة الشروط الابتدائية: $xy'-y^2=1$, $y(1)=1$.

[4] حل المعادلات التفاضلية الأتية :

(i) $\ln(y^2+1)\,dx+\dfrac{2y(x-1)}{y^2+1}\,dy=0$

(ii) $4xy'-y=4xy^5\ln x$

مع التمنيات بالتوفيق