الفرقة : الاولى المادة : تفاضل وتكامل كود المادة : 112 الدرجة الكلية : 80 درجة	كلية العلوم – قسم الرياضيات برنامج: الرياضيات– الاحصاء وعلوم الحاسب– الفيزياء– الفيزياء الحيوية	دور مايو 2014 الزمن: ساعتان التاريخ : 17 / 5/2014

اجب عن الاسئلة الاتية

السؤال الاول : (24 درجة)

(أ)- اوجد قيمة الثابت c التى تجعل الدالة الاتية متصلة عند $x=0$

$$f(x)=\begin{cases}\dfrac{1-\cos x}{x} & x\neq 0\\ c & x=0\end{cases}$$ (6 درجات)

(ب)- اوجد $\lim_{x\to 0}(1+x)^{\frac{1}{x}}$ (6 درجات)

(ج)- اوجد المشتقة الاولى y' للدوال الآتية: (12 درجات)

(1) $y=\dfrac{x^2\sqrt{x+1}}{(3x+2)^5}$

(2) $xy=\tan y$

(3) $y=2^{\sin^2(\sqrt{x})}$

(4) $y=\sinh^{-1}(\sec x)$

السؤال الثانى : (28 درجة)

(أ) اوجد مجال التعريف والمدى للدالة $f(x)=\sqrt{4-x^2}$ (6 درجات)

(أ) - حقق نظرية رووِل للدالة $f(x)=x^3-x$ على الفترة $[0,1]$ (6 درجات)

(ب) اوجد فترات التزايد والتناقص والتقعر لأعلى والتقعر لأسفل والقيم العظمى والصغرى والخطوط التقاربية للدالة $f(x)=\dfrac{x^2+1}{x}$ (16 درجة)

السؤال الثالث : (28 درجة)

احسب التكاملات الاتية

(أ)- $\int \dfrac{\cos x}{\sqrt{1+\sin^2 x}}dx$

(ب)- $\int \tan^2 x\,dx$

(ج)- $\int \sin^{-1} x\,dx$

(د)- $\int \dfrac{dx}{\sqrt{x}-\sqrt[3]{x}}$

(هـ)- $\int \dfrac{dx}{\sqrt{21+4x-x^2}}$

(و)- $\int \dfrac{1}{x\ln x}dx$

(ز)- $\int \dfrac{(1+\sqrt{x})^9}{\sqrt{x}}dx$

مع اطيب التمنيات بالتوفيق والنجاح

ا.د محمد الشافعى و د. عبد المنعم لاشين

Mansoura University Faculty of Science Chemistry Department Subject Code: CHEM 141 Subject: Physical Chemistry	كلية العلوم جامعة المنصورة	Second Term Examination 1st level students Date: 3/6/2014 Time Allowed: 2 hours Full Mark: 60 Marks

Answer the following (60 marks) ***Choose the correct answer:***

1. What will be the partial pressure of H_2 in a flask containing 2 grams of H_2, 14 grams of N_2 and 16 grams of O_2 ? (O =16, N=14, H=1)
   (a) 1 / 2 the total pressure (b) 1/ 3 the total pressure
   (c) 1 / 4 the total pressure (d) 1/16 the total pressure

2. If 1.5 g of gas has 195 ml volume at 12°C and 490 mm Hg pressure, its molecular weight is
   (a) 280.7 (b) 270.2 (c) 178 (d) 275

3. The kinetic theory of gases predicts that total kinetic energy of a gaseous assembly depends on:
   (a) Volume of the gas (b) Temperature of the gas
   (c) Pressure, temperature and volume of the gas (d) Pressure of the gas

4. In the kinetic gas equation, $PV = 1/3\ mNU^2$ hence U is:
   (a) Average speed (b) Most probable speed
   (c) Root mean square speed (d) not any of those

5. Measured at constant temperature and pressure, the volume of same number of gram-molecules of different gases would be same. The above statement refers to:
   (a) Charles's law (b) Avogadro's law
   (c) Boyl's law (d) Amontn's law

6. The rate at which a gas diffuses at constant temperature is proportional:
   (a) Inversely to its density (b) Directly to the square of its density
   (c) Inversely to the square root of its density (d) varies directly to its density

7. for the reaction: $CO_{(g)} + Cl_{2\,(g)} = COCl_{2(g)}$ the value of K_p/K_c is equal to:
   (a) RT (b) 1/ RT (c) 1 (d) $\sqrt{RT}$

8. The yield of product in the reaction $A_{2\,(g)} + 2B_{\,(g)} = K_{\,(g)}$ + heat
   Would be higher at: (a) Low temperature and low pressure (b) High temperature and high pressure
   (c) Low temperature and high pressure (d) High temperature and low pressure

9. If K_p for the reaction P + 2Q = 3R + S is 0.05 at 1000 K so K_c for this reaction
   (a) $5x10^{-4}$ R (b) $5x10^{-5}/R$
   (c) 0.002R (d) $5x10^{-5}$ R

10. Equilibrium constant for the reaction $2A_{\,(g)} = B_{\,(g)} + C_{\,(g)}$ at 780 K and 10 atm pressure is 3.52. The equilibrium constant of this reaction at 780 K and 20 atm pressure is:
    (a) 5.72 (b) 11.44 (c) 28.6 (d) 3.52

11. The equilibrium constant for the reaction, $HA + B \leftrightharpoons BH^+ + A^-$ is 100. If rate constant for forward reaction is $10^5 mol L^{-} s^{-1}$, then rate constant for the backward reaction is:
    (a) 10^3 mol L^{-1} S^{-1} (b) 10^6 $L^{-1}S^{-1}$
    (c) 10^{-3} mol L^{-1} S^{-1} (d) 10^{-5} mol L^{-1} S^{-1}

12. in the reaction: $H_2(g) + I_2(g) \leftrightarrow 2HI(g)$ at equilibrium, when some I_2 is added. What happens to the equilibrium?
    (a) It is shifted to the right (b) It remains unchanged
    (c) It is shifted to the left (d) none of the previous

13. In which case the reaction is farthest from completion?
    (a) $K_c = 10^3$ (b) $K_c = 10$ (c) $K_c = 10^4$ (d) $K_c = 10^{-8}$

14. The solubility of saturated solution of AgCl ($K_{sp} = 10^{-10}$) is:
    (a) 10^{-5} (b) 10^{-10} (c) 10^{-15} (d) 10^{-20}

15. The hydrogen ion concentration of 0.001 N NaOH solution is:
(a) $1x10^{-11}$ M (b) $1x10^{-13}$ M (c) $1x10^{-12}$ M (d) $1x10^{-14}$ M

16. Which of the following is a weak electrolyte?
(a) NaOH (b) CH_3COOH (c) HCl (d) NH_4Cl

17. The equilibrium between water and its vapor, in an open vessel:
(a) Can be achieved (b) Depends upon pressure
(c) Cannot be achieved (d) Depends upon temperature

18. The chemical equilibrium of a reversible reaction is not influenced by:
(a) Temperature (b) Pressure (c) Catalyst (d) Concentration

19. The pH of a solution of NH_4Cl is:
a) Equal to 7 b) more than 7 c) less than 7 d) equal to zero

20. The solubility of a gas increases in a liquid with:
(a) Increase of temperature (b) amount of liquid taken
(c) Decrease in temperature (d) reduction of gas pressure

21. When attraction between A – B is more than that between A A and B – B the solution will show..... deviation from Raoult's law:
(a) Positive (b) Negative (c) No effect (d) cannot be predicted

22. The vapor pressure of a solvent A is 0.80 atm. When a non-volatile substance B is added to this solvent its vapor pressure drops to 0.6 atm. The mole fraction of B in the solution is:
(a) 0.25 (b) 0.90 (c) 0.50 (d) 5.0

23. Find the volume of a solution having 1 mol of sugar and an osmotic pressure of 1 atm at 0°C
(a) 11.2 litre (b) 2.24 litre (c) 22.4 litre (d) 112 litre

24. The boiling point of a solution of 0.11 g of a substance in 15 g of ether (K_b=2.16) was found to be 0.1 °C higher than that of pure ether. The molecular weight of the substance will be:
(a) 168 (b) 158 (c) 148 (d) 178

25. The depression of freezing point is directly proportional to:
(a) Molarity of the solution (b) mole fraction of the solution
(c) Molality of the solution (d) molarity of the solvent

26. for 0.5 M aqueous solution of certain electrolyte, the osmotic pressure:
(a) Increases with increase in temperature
(b) Decreases with increase in temperature
(c) is independent of temperature
(d) First increases and then decreases with increase in temperature

27. A gas diffuses at twice the rate of that of oxygen under same conditions of temperature and pressure. The molecular mass of the gas will be:
(a) 64 (b) 8 (c) 16 (d) 2

28. In which of the following gaseous reactions, Kp and K_c have the same values?
(a) $2HI = H_2 + I_2$ (b) $N_2 + 3H_2 = 2NH_3$
(c) $2SO_2 + O_2 = 2SO_3$ (d) $PCl_5 = PCl_3 + Cl_2$

29. Real gas can reach the state of ideality at:
a) High pressure (b) low pressure (c) high temperature (d) low temperature

30) Van der Waal's equation corrected:
a) Volume and pressure b) temperature and volume c) pressure and volume
d) Number of moles and Temperature

Examiners: Prof.Dr. A.S.Fouda, Prof.Dr.M.Emam, Dr. M.Hamada, Dr. G.Elewady, Dr.S.El-Defrawy

Mansoura University Faculty of Science **PHYSICS DEPARTMENT** **Final Exam – 2nd Term** *(June 2014)*	**2013 – 2014**	**First Year Students** **(Phys. + Biophys. + Math. + Stat.)** **Course: PHY 104 (Electromagnetic Theory)** **Time allowed: 2 hours**

Answer the following questions (Q1: 20 Mark, Q2: 15 Mark, Q3: 15 Mark, Q4: 10 Mark) **Full Mark: 60**

Q1: Choose the best answer:

1. At Cartesian point (1, 3, 4), which of the following is incorrect

a) $\rho = 3.1623$ b) $r = 5.099$ c) $\phi = \tan^{-1}(3)$ d) $\theta = \tan^{-1}(3/4)$

2. For any vector field $\underline{A}$, which of the following is correct

a) $\underline{\nabla}\cdot\underline{\nabla}\cdot\underline{A} = 0$ b) $\underline{\nabla}\times\underline{\nabla}\cdot\underline{A} = 0$ c) $\underline{\nabla}\times\underline{\nabla}\times\underline{A} = 0$ d) all

3. The continuity equation for steady current has the form:

a) $\underline{\nabla}\cdot\underline{J} = 0$ b) $\underline{\nabla}\times\underline{J} = 0$ c) $\underline{\nabla}\times\underline{J} + \frac{\partial\rho}{\partial t} = 0$ d) $\underline{\nabla}\cdot\underline{J} + \frac{\partial\rho}{\partial t} = 0$

4. For isotropic, linear and homogeneous dielectric material, the relation between the polarization vector $\underline{P}(\underline{r})$ and electrostatic filed intensity $\underline{E}(\underline{r})$ is given by

a) $\underline{P}(\underline{r}) = \chi\underline{E}(\underline{r})$ b) $\underline{P}(\underline{r}) = \varepsilon_0\chi\underline{E}(\underline{r})$ c) $\underline{P}(\underline{r}) = \varepsilon\chi\underline{E}(\underline{r})$ d) none

5. A filed $\underline{F}$ is said to be conservative if

a) $\underline{\nabla}\cdot\underline{F} = 0$ b) $\underline{\nabla}\times\underline{F} = 0$ c) $\oint_C \underline{F}\cdot d\underline{\ell} = 0$ d) **b** and **c**

6. At the boundary of two dielectric materials, the boundary conditions should be

a) $E_{1t} = E_{2t}$, $E_{1n} = E_{2n}$ b) $D_{1t} = D_{2t}$, $D_{1n} = D_{2n}$ c) $E_{1t} = E_{2t}$, $D_{1n} = D_{2n} + \sigma$ d) $D_{1t} = D_{2t} + \sigma$, $E_{1n} = E_{2n}$

7. The element of current takes the formula

a) $Id\underline{\ell}$ b) $\underline{J}dV$ c) $\underline{v}dQ$ d) all

8. Ampere's circuital law takes the form

a) $\oint_C \underline{B}\cdot d\underline{\ell} = I_{enc.}$ b) $\underline{\nabla}\times\underline{H}(\underline{r}) = \underline{J}(\underline{r})$ c) $\oint_C \underline{H}\cdot d\underline{\ell} = I_{enc.}$ d) **b** and **c**

9. Gauss' law in electrostatics corresponds to ..... Maxwell's equation (write its formula after the choice)

a) 1st b) 2nd c) 3rd d) 4th

10. Gauss' law in magnetostatics corresponds to ..... Maxwell's equation (write its formula after the choice)

a) 1st b) 2nd c) 3rd d) 4th

Q2: A) A charged cylinder of radius R and length L, and its surface charge density varies as $\sigma = \sigma_0\cos\varphi'$.

Find the electrostatic field strength $\underline{E}(\underline{r})$ along the cylinder axis. Extend the result for an infinite cylinder.

B) Find the magnetostatic field density on the axis of a coil of radius R, and N turns.

Q3: A) For any scalar function ϕ, prove that $\underline{\nabla}\times\underline{\nabla}\phi = 0$. Then use the 1st Maxwell's equation to derive the formula of electrostatic filed intensity $\underline{E}(\underline{r})$ from the electrostatic potential $U(\underline{r}) = \frac{1}{4\pi\varepsilon_0}\int_V \frac{\rho(\underline{r}')dV'}{|\underline{r} - \underline{r}'|}$.

B) Account on the Maxwell's four equations of electromagnetic theory.

Q4: A) Solve Laplace's equation in Cartesian coordinates for a parallel plates capacitor and find the electrostatic potential and field intensity between the two plates.

B) Define each of the following:

Poisson's equation – Faraday's law – electric susceptibility – Polarization vector – Displacement vector

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With my best wishes,,,,, *Dr. M. Sallah*

كلية العلوم
قسم الرياضيات
المستوى الأول
الدرجة الكلية:80 درجة

دور مايو2014
الزمن:ساعتين
المادة:ميكانيكا(2)
كود المادة: ر122

برامج: رياضيات-إحصاء وعلوم الحاسب-فيزياء-فيزياء حيوى-جيوفيزياء

السـؤال الأول:[20 درجة]

(1) **ضع علامة (√) أمام العبارة الصحيحة و علامة (×) أمام العبارة الخاطئة مع تصحيح الخطأ:** [10 درجات]

i. إذا كان عزم الأنحناء عند نقطة فى قضيب $M=\frac{3}{2}x^2+5$ ، فإن قوة القص $F=3x$.

ii. إذا ترك جسيم يتحرك فى دائرة نصف قطرها a بسرعة زاوية ثابته ω ،فإن مقدار عجلته $\frac{\omega^2}{a}$.

iii. إذا سقط جسيم من السكون تحت تأثير وزنه فى وسط مقاوم مقاومته ثابته تساوى $\frac{g}{2}$ لوحدة الكتل من إرتفاع H من سطح الأرض، فإنه يصل إلى الأرض بعد زمن قدره $\sqrt{\frac{H}{g}}$.

iv. يتحرك جسيم فى خط مستقيم (محورx) تحت تأثير قوة ثابتة مقدارها α لوحدة الكتل تتجه دائما نحو نقطة الأصل O، فإذا قذف الجسيم من نقطة الأصل بسرعة v_0 فإنه يسكن بعد أن يقطع مسافة مقدارها . $\sqrt{\frac{v_0^2}{2\alpha}}$.

v. إذا تحرك جسيم فى خط مستقيم تحت تأثير قوه $\frac{-d\Phi}{dx}$ ، فإن $\frac{1}{2}mv^2+\Phi=c$ حيث v هى سرعة الجسيم عند أى موضع، c ثابت إختيارى.

(2) **أكمل مايلى..** [10 درجات]

i. ينص قانون نيوتين الثانى على .....

ii. معادلة حركة جسيم متغير الكتلة تكافىء حركة جسيم تحت تأثير قوتان هما .....،.....

iii. يتحرك جسيم على محيط دائرة نصف قطرها a وكان بعده الزاوى عن نقطة ثابته علي الدائره هو $\theta=\frac{t^2}{2a}$ ، فإن مقدار سرعته عند اللحظة الزمنية $2\sec$ هى .....

iv. إذا كان $M_A=-120N.m, M_B=80N.m$ هما قيمتا عزم الإنحناء عند النقطتين A,B من القضيب، فإن القضيب يكون أكثر عرضه للكسر عند النقطه .....

بقية الأسئلة فى الخلف

السـؤال الثاني:[20 درجة]

(1) جسيم كتلته الوحدة يتحرك فى خط مستقيم بحيث يكون بعده عن نقطة ثابته على هذا الخط هو $x = t - 2\sqrt{t}$ فأوجد القوة المؤثرة على الجسيم كدالة فى الموضع . [10 درجات]

(2) قذف جسيم رأسيا إلى أعلى بسرعة إبتدائية v_0 فى وسط مقاومته تساوى $\frac{v^2}{v_0^2} g$ لوحدة الكتل ، حيث v سرعة النقطة عند أى موضع، أوجد أقصى إرتفاع تصل إليه الجسيم. [10 درجات]

السـؤال الثالث:[20 درجة]

(1) AB قضيب منتظم طوله $2l$ يستند فى وضع أفقى على حاملين عند طرفيه ،فإذا كانت كتلة وحدة الأطوال منه تساوى f. إرسم المنحنيات للقوى القاصة و العزم الحانى للأجزاء المختلفة للقضيب موضحا أين يكون القضيب أكثر عرضه للكسر . [10 درجات]

(2) أعد صاروخ للإنطلاق رأسيا إلى أعلى و كانت كتلته الكلية $2m$ منها m من الوقود، فإذا كان الصاروخ يقذف المواد الناتجة من إحتراق الوقود بمعدل ثابت $\frac{m}{40}$ كل ثانية بسرعة نسبية $65g$ ، فأثبت أن الصاروخ لا ينطلق إلا بعد $15\sec$ من إشتعاله ثم أوجد المسافة الرأسية التى يتحركها الصاروخ بعد نفاذ الوقود حتى يسكن. [10 درجات]

السـؤال الرابع:[20 درجة]

بدأت نقطة مادية الحركة من سكون من أعلى نقطة على سطح كرة ملساء نصف قطرها a فأثبت أن

i. تترك النقطه السطح عندما تنزلق زاوية قدرها $\cos^{-1}\frac{2}{3}$ [10 درجات]

ii. عندما تبعد النقطة المتحركة عن القطر الرأسى مسافة $a\sqrt{5}$ ،يكون عمقها أسفل مركز الكرة هو $\frac{19a}{4}$ [10درجات]

مع أطيب الأمانى بالتوفيق و النجاح

ا.د/مجدى إلياس- د/ الشحات عبد العزيز- د/عادل عبد العزيز

كلية العلوم
قسم الرياضيات
المستوى الأول
الدرجة الكلية:80 درجة

دور مايو2014
الزمن:ساعتين
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i. ينص قانون نيوتين الثانى على .....

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بقية الأسئلة فى الخلف

السـؤال الثانى:[20 درجة]

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i. تترك النقطه السطح عندما تنزلق زاوية قدرها $\cos^{-1}\frac{2}{3}$ [10 درجات]

ii. عندما تبعد النقطة المتحركة عن القطر الرأسى مسافة $a\sqrt{5}$ ،يكون عمقها أسفل مركز الكرة هو $\frac{19a}{4}$ [10درجات]

مع أطيب الأمانى بالتوفيق و النجاح

ا.د/مجدى إلياس- د/ الشحات عبد العزيز- د/عادل عبد العزيز

دوائر كهربية ف ١٠٢ الرياضيات + الإحصاء، علوم حاسب - الفيزياء - الفيزياء الحيوية

Mansoura University
Faculty of Science
Physics Department.

Final term exam – 2nd term
First level Ph.103
Electric circuits
Date : 6/2014
Time allowed : 2 hours
Full Mark: 80 Mark

Answer The Following Questions

1- a) Find the dc voltage and rms voltage for the waveform in figure (1 –a)

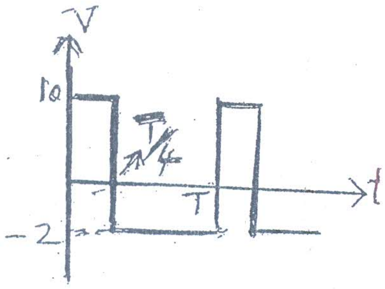

figure (1-a)

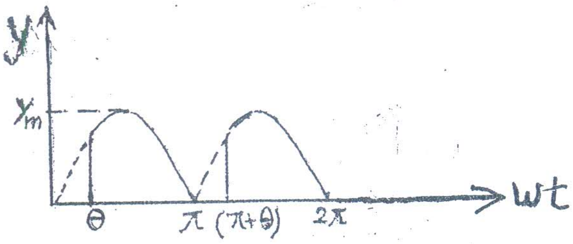

figure (1-b)

b- A delayed full wave rectified sine wave figure (1-b) has an average value of 1/2 Y_m , Find the angle θ.

2- In the series RLC circuit shown in figure (2), if the total voltage (V) and the current (I) are given by the equations

$V = 353.5 \cos(3000t - 10°)$

$I = 12.5 \cos(3000t - 55°)$

Find the value of R , C and the equations of V_R and V_C

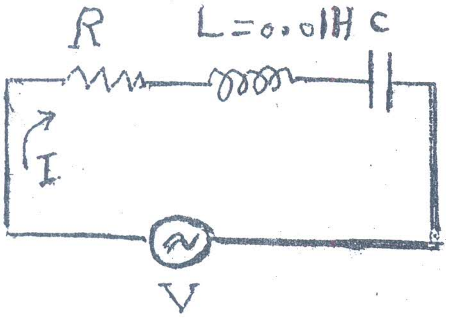

figure (2)

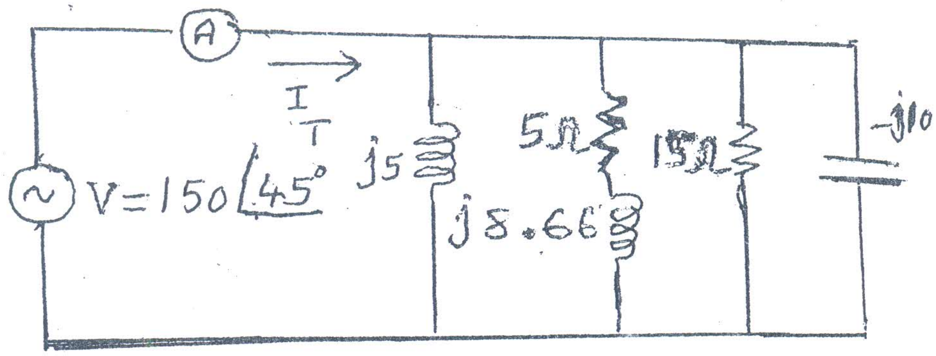

figure (3)

3- In the circuit shown in figure (3). Find the value of the Ammeter reading (A) and the equivalent impedance of the circuit.

Examiners: Dr . Hamed Ibrahim & Dr. Aziza Atta

Best wishes

Mansoura University
Faculty of Science
June 7th, 2014

First Year
2nd Semester
Time: 2 hrs

English Language Exam (102 ع)

Section One: Reading Comprehension: (30 marks)

Read the following passage then answer the questions that follow:

1. Any ecosystem is made up of two parts: nonliving (the physical environment) and living (the biological community). The nonliving environment usually includes energy from the sun, temperature, water, gases in the air, wind, soils, and the rocks beneath ***them***, and the topography, or shape of the land. These nonliving parts of the ecosystem determine the kind of life that exists in an ecosystem and they also affect each other.

2. The world's deserts for example, occur where the annual rainfall is ten inches or less. This lack of rain is sometimes caused by topography. Along the west coast of North America, winds carry water vapor inland from the Pacific Ocean. The air is forced to rise as it hits the coastal mountain ranges. As it rises it cools and the water vapor in the air falls as rain or snow on the seaward side of the mountains. As a result, there is little rainfall on other side. This is called the rain shadow effect. In the Cascade Mountain of Washington, the annual precipitation may reach a hundred inches. Beyond the Cascades, in the Colombia River Valley, the annual rainfall is about nine inches. So the topography has a tremendous influence on the amount of water that falls on the land. This, in turn, affects the plant and animal life.

3. The living parts of an ecosystem often affect the nonliving parts. When rain falls on a forest, the tree branches and leaves help break the force of the drops. Layers of dead leaves on the forest floor soak up water and prevent the drops from washing soil away. Little water runs off the land. So the living trees help maintain the soil on which ***they*** depend. In fact, the trees add to the soil, since the leaves that fall to the forest floor eventually decay and become part of the soil itself.

4. Soils offer the best example of how nonliving and living parts of an ecosystem affect each other. Soil is made up mostly of grains of minerals, such as silica and clay that are freed as rocks slowly break down. Spaces between the mineral particles are filled with air or water. Roots reach down into the soil, changing it physically (by loosening packed particles) and chemically (by withdrawing minerals). Dead parts of plants and animals are brought deeper into the soil by earthworms and other soil animals. Thousands of organisms live in a handful of soil. Most of ***them*** are too small to be seen, but they all affect the soil by taking minerals from it and adding wastes and their dead bodies to it.

5. As ecologists study ecosystem, they often turn to the science of meteorology for information. Does the annual rainfall come mostly in one reason, or is it spread evenly over the year? How does the temperature vary between day and night, and through the year?

6. Finding answers to such questions is important because the climate of an area has a tremendous effect on its plant and animal life. To learn more about the living parts of an ecosystem, you might visit a small pond. To get there, you will probably have to hike through a field or a forest. You may cross a stream that flows into the pond, or another that flows out. Clearly, the pond must be affected by other ecosystems, and the pond must affect ***them***.

7. A pond ecosystem usually contains all of the nonliving factors mentioned above. The sun provides the energy of life. The climate determines how much rain falls on the area, the length of the growing season for plants, and whether the pond is covered with ice in winter. These factors can have great effect on the life that the pond supports. The underlying rocks and soils affect the chemistry of water which in turn helps determine what kinds of plants and animals live in the water. And the life of the pond affects the nonliving environment: when plants and animals die, ***their*** remains settle to the bottom and decay there, adding to the bottom muck and making the pond more shallow.

I. Answer the following questions:

a. What is ecosystem made of?
b. Give examples of the nonliving environment.
c. How do trees add to the soil?
d. What is the role of micro-organisms?
e. How can roots change the soil?

II. Complete the following sentences according to the passage:

a. When ecologists study ecosystem, they often turn to science of_____.
b. The world's deserts occur where the annual rainfall is_____.
c. The lack of rain on some areas is sometimes caused by_____.
d. Dead parts of plants and animals are brought into the soil by_____.

III. Say whether the following sentences are *True* or *False*:

a. The living parts of an ecosystem always affect the nonliving parts.
b. Soil is made up mostly of grains of minerals.
c. The underlying rocks and soils, in a pond, affect the chemistry of water.
d. The life of the pond affects the living environment.
e. A pond ecosystem rarely contains all of the nonliving factors mentioned in the passage.

IV. What do the underlined words in the passage refer to?

a. them	(paragraph 1)	**b. they**	(paragraph 3)
c. them	(paragraph 4)	**d. them**	(paragraph 6)
e. their	(paragraph 7)		

V. Give the antonyms of the following words from the passage:

a. allow	(paragraph 3)	**b. deep**	(paragraph 6)
c. surface	(paragraph 6)	**d. tightening**	(paragraph 4)
e. take from	(paragraph 5)		

Section Two: Grammar Focus: (20 marks)

I. Use the verb and the tense given in brackets to fill the gaps whether in active or passive:

a. The words_____by Peter. **(to write – Simple Present)**
b. We_____a letter yesterday. **(to send – Simple Past)**
c. The car_____. It's too old. **(not/to steal – Will – Future)**
d. This street_____because of snow. **(already/ to close – Present Perfect)**
e. A new restaurant_____next week. **(to open – Will – Future)**

II. Fill in the blanks with the appropriate article (a, an, the, or nothing):

a. I borrowed_____pencil from your pile of pencils and pens.
b. My daughter is learning to play_____violin at her school.
c. I lived on_____Main Street when I first came to town.
d. Albany is the capital of_____New York.
e. _____apple a day keeps the doctor away.

III. Choose the correct verb in parentheses:

a. A military regime of high-ranking officers **(run / runs)** the government.
b. Neither the President nor the Senators **(has / have)** found a solution.
c. Half of the candy bars **(were / was)** eaten by the children before dinner.
d. Neither of your arguments **(makes / make)** sense.
e. The value of many of these antiques **(have / has)** not been determined.
f. Both Chapter One and Chapter Two **(is / are)** easy.
g. Statistics **(is / are)** a branch of mathematics.
h. The children's new toy **(is / are)** already broken.
i. Each penny, nickel, dime, and quarter **(has / have)** to be counted carefully.
j. The statistics on the divorce rate in the United States **(is / are)** alarming.

Section Three: Language Function: (10 marks)

Choose the correct word:

1. The scientist mixed baking soda with vinegar. What did he do?

a. commiserated **b. combined** **c. coexisted** **d. committee**

2. Which word would be used to describe a monkey born with seven fingers?

a. polyglot **b. polydactyl** **c. polyhedron** **d. polygon**

3. While on vacation, I saw the famous 8-foot- high_____.
a. monologue **b. monolith** **c. monotone** **d. monocle**

4. If you went to Egypt, you would see many of these_____.
a. polyhedrons **b. polygraphs** **c. polygons** **d. polyglots**

5. The gentlemen of the past used_____to take a closer look at something.
a. monoliths **b. monologues** **c. monorails** **d. monocles**

6. Dr. Mcdonald helps people who get rashes on their skin. What did he study?
a. geology **b. biology** **c. psychology** **d. dermatology**

7. Granny Gums is 88 years old. She'll only be one of these for two more years.
a. centenarian **b. librarian** **c. octogenarian** **d. governor**

8. Some channels put the pictures of these people to celebrate their 100^{th} birthdays.
a. octogenarian **b. legislators** **c. veterinarians** **d. centenarians**

9. When you can't figure out the answer to the math problem but you keep on trying, what are you showing?
a. perseverance **b. patience** **c. tolerance** **d. annoyance**

10. The bride at the wedding looked amazing. What did she display?
a. elegance **b. patience** **c. annoyance** **d. tolerance**

Section Four: Writing Skills: (30 marks)

I. Write a contrast paragraph not *less than 10 lines* discussing *an invention that you think has changed the world*. (Don't forget to draw your brainstorming)

II. Each definition below has a mistake. Explain the types of these mistakes.

a. An ammeter is used to measure electric current.
b. A lecturer is a person who lectures.
c. A dictionary is a book like "Collins Cobuild English Dictionary".
d. A degree is given by a university to a student who has passed the appropriate examinations.

Good luck