Mansoura University		Computer Engineering and Control Syst. Dept Total Marks: 50 Marks	Faculty of Engineering

Course Title: Introduction . to Programming. & And Computers
Date: June, 2013 (Second Term)   Allowed time: 2 hrs

Course Code: 1026 CSE
No. of Pages: (1)

Remarks: (Answer the following questions... assume any missing data)

Question No. (1)   (20 Marks)

(a) **2 points** Draw a chart that depicts Contents of computer system

(b) **2 points** Compare between (Main Memory and Secondary Memory) – (compilers and interpreters)

(c) **2 points** Compare between various wireless alternatives when we want to build a network,(i) for a large office that has several small rooms. (ii) for a large campus area (such as Mansoura University)

(d) **2 points** Write a short note about (Computer network types, models, and applications) - Transmission media -Software development life cycle

(e) **2 points** Compared to for loop style, when is it convenient to use Do-while loop?

(f) **2 points** What is (are) the difference between do while loop and do until loop?

(g) **4 points** Draw the flow chart to determine the grade of student (ie. Fail,..,Good..), Input is his degrees in three subjects

(h) Write an algorithm that accept a number and check whether it is a prime or not (then draw its flow chart)

Question No. (2)   (30 Marks)

(a) The basic equation describing the properties of gases is the ideal gas law; $PV = nRT$ In addition we know that the number of kmoles of gas is equal to the mass of the gas divided by the molar mass (also known as the molecular weight) or $n = m/MW$, where $m = Mass\ in\ kg$, $MW = molar\ mass\ in\ kg/kmol$. Now suppose you know that the volume of air in the wind tunnel is $1000\ m^3$. Before the wind tunnel is turned on, the temperature of the air is $300\ K$, and the pressure is $100\ kPa$. The average molar mass (molecular weight) of air is approximately $29\ kg/kmol$. Write a **VB code** to find the mass of the air in the wind tunnel. **8 points**

(b) A large company pays its salespeople on a commission basis. The salespeople receive $200 per week plus 9% of their gross sales for that week. For example, a salesperson who sells $5,000 worth of merchandise in a week receives $200 plus 9% of $5,000, or a total of $650. Develop a VB application that inputs one salesperson's gross sales sold for last week and calculates and displays that salesperson's earnings. **8 points**

(c) Write a **VB program** that accepts the values of a two dimensional array (contains four rows and four columns) then calculate the sum of the diagonal and print the sum on the output window. **6 points**

(d) Consider x as an input, and y as an output. Draw a **flow chart** that can model the equation below

$$y(x) = \begin{cases} x^2 + 9 & x \le 4 \\ x + 21 & otherwise \end{cases}$$

Q3-A) (15 points) Write a **VB program** that Simulate projectile motion on earth [for 10 seconds] – (Cannon ball exits the cannon at position (0,0)- Ask user for initial velocity - Report the position of the cannon ball every second) : Use the following facts

(d_x: displacement in the X direction can be calculated as) $d_x = d_x + 0.5\ a_x\ t^2 + v_x\ t$
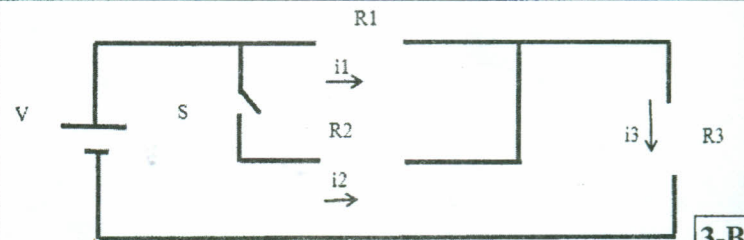
(d_y: displacement in the Y direction can be calculated as) $d_y = d_y + 0.5\ a_y\ t^2 + v_y\ t$

(v_x velocity on the x direction can calculated as) $v_x = v_x + a_x\ t$

(v_y velocity on the Y direction can calculated as) $v_y = v_y + a_y\ t$
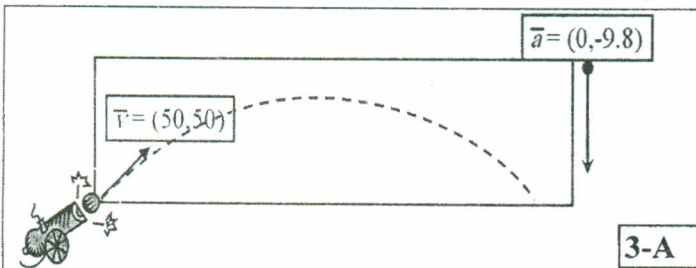
Q3-B) (10 points) Write a VB.NET program to calculate the current in each resistance in the previous circuit?

Best wishes