**تعليمات مهمة:**

1. **مدة الامتحان 110 دقيقة تبدأ الساعة 14:00 مساءا يوم 20/06/2021 وتنتهي الساعة 15:50 مساءا يوم 20/06/2021**
2. **الامتحان مكون من ثلاثة اسئلة مختلفة يرجى إجابة كل سؤال على ورقة منفصلة.**
3. **تأكد من كتابة أسمك كاملا ورقم تسجيلك على كل ورقة إجابة.**
4. **إحفظ الملف الذي يحتوي الاجابات بإسم على النحو التالي: firstName\_Lastname\_incomplete ثم حمله وارسله واحرص على أن لا يتجاوز حجم الملف 20 MB .**
5. **احرص عزيزي الطالب على الالتزام بالتعليمات أعلاه وتسليم حلولك الخاصة وعدم مشاركة اجاباتك مع اي طالب اخر لتجنب خسارة العلامات.**
6. **يجب الالتزام بالملاحظات المتعلقة بكل سؤال علما بأنه لن ينظر في الحلول التي لا تتوفر فيها الشروط الواردة في هذه ملاحظات.**

**Question #1: (13 Points)**

Explain five different aspects of Extreme programming that may encourage you to favor it on Waterfall software process model. And then five different aspects of waterfall model that may encourage you to favor it on Extreme programming.

Use your own words as much as you can. Avoid copy/paste to get credits

**Question #2: (13 Points)**

Pipe and Filter software architectural pattern is a widely used pattern. You are required to discuss the applicability of this pattern in the following situations:

1) when data can be in different formats

2) when High performance of the application is important

3) when reusability is important

4) when Ease of deployment is important

**Question #3: (14 Points)**

Draw an activity diagram for a cookies and snacks (chocolate, biscuits, chips, etc…) selling machine. The machine works as follows:

The machine can be powered on or off. If it is powered on then initially it is idle (do nothing just LCD screen displaying date). When a user wants to buy something he/she can enter its code. Codes are written under each item. If the user inputs a Wrong item code, the machine will display a message "Wrong code" and enable user to enter a new code. The machine has a simple keypad where the user can input the item codes. After entering the item code, a user can insert coins while inserting coins the total will be displayed on the LCD. When enough coins have been inserted the machine will release the item. Acceptable coin units are:1, 2, 5, and 10. The price of items depends on the item code. If inserted coins are not enough and the user is not inserting more coins, the machine will wait for 5 seconds and then display the message "insert more coins" if the inserted coins are enough the machine will release the selected item. If more coins are inserted the machine will return the change and release the selected item. If an error is detected the "service needed" message will be displayed and coins will be returned.

Assume that there are always items in the machine. It cannot be empty.

The user can cancel the process any time Before the machine releases the item by just pressing the *cancel* button on the keypad. In that case the machine will return the coins.

If the user wants to change the item while inserting coins, he/she can press the *change selection* button on the keypad and then enter the new item code and then resume inserting coins.

In the case that you find the above description needs some more necessary information, write down your assumptions and solve the problem based on that.

Note: The design of this machine is a creative process and can differ from one designer to another. Your solution must not match with any other solution unless you share your solutions.