***Question➊* Solve the following problem**

**You are a biomedical engineer, and you are asked for design a water-in steam autoclave**

1. Draw your design with all required items as chamber size, chamber material, temperature sensor, heater …….
2. Draw your flowchart which can perform all required process starting from cycle selection till sterilization process?
3. Regarding the different stages of the steam autoclave (Pre-heating –condition – sterilization - dry) , indicate the state of every valve used in your design.
4. What will be happened, if the amounts of the water increase / decrease inside the chamber through the main process? And what the recommended solutions?
5. You are a designer engineer and you should put all the required safety actions to safe the device. What are the recommended actions?
6. If at maintenance procedure, the main heater is replaced by half heater value, in your opinion what will be happened for the sterilization process.
7. How can you control your heater using power control elements as TRIAC.

***Question➋*  Select one of the medical laboratory sections and solve the following items**

* Medical lab section definition
* List of medical equipment required in this lab indicating the importance of every equipment
* Draw a block diagram of one basic equipment showing the main parts
* Illustrate the basic idea of operation of this equipment
* What is your vision to improve its function and / or add option for this device to enhance its performance