Task 1 - Design

You must:

a) produce a detailed design specification that builds on the design criteria given in the assignment brief, including any references to research used. The specification should include:
   - a definition of the operating limits of the system
   - an analysis of how system stability will be achieved

b) generate a suitable design for the control system, including:
   - annotated sketches, block and wiring diagrams for the system that show how it will function
   - selection of appropriate sensors with justifications, and all relevant calculations
   - selection of appropriate pre alarm temperatures with justifications and all relevant calculations. (The exact position of the pre alarm range limits will be determined by the design of your system)

c) produce a virtual model of the proposed design using appropriate software

d) create a bill of materials (BoM) listing all of the parts required in your final design proposal.

Conditions of assessment:

- the time allocated for this task is **14 hours**
- you must carry out the task on your own, under **controlled conditions.**

Controlled conditions:

- you must only work on the tasks in the allocated times
- assessment evidence must be handed in at the end of each session for secure storage which cannot be accessed
- you must not share or discuss your work with other candidates
- you are not permitted to bring any materials into the assessment session.

What must be produced for marking:

- design specification
- annotated sketches, block and wiring diagrams
- design options for the sensors with justifications, and calculations
- selection of appropriate pre alarm temperatures with justifications and calculations, including all workings
- outcomes of the virtual modelling of the proposed system design, either as screen captures or printouts
- bill of materials

Additional evidence

- any notes produced of research undertaken including citation of sources and internet search history must be submitted to ensure the authenticity of evidence produced.

Resources:

- access to the internet for research purposes
- access to appropriate virtual modelling and CAD software
- manufacturer's datasheets for component parts
- manufacturer's instructions for component parts
- scientific calculator.