THE FINAL EXAMINATION

ACADEMIC YEAR: 2021-2022

DEPARTMENT: …..

SEMESTER: …..

MODULE TITLE:…….

MODULE CODE: ……

CREDITS: 3

DATE:…

DURATION: 3 Hrs

MAXIMUM MARKS: 60

INSTRUCTIONS:

1. This examination paper comprises ***TWO sections***
2. ***Section A*** is ***COMPULSORY (Attempt all questions)***
3. Attempt any other ***two (2) questions from Section B***
4. Cell phones and any other electronic programmable device are not allowed inan examination room
5. Each student must have his/her own calculator
6. Start each question on a fresh page
7. Make sure you fill the answer booklet cover page with required informationwith a legible handwriting
8. Write all answers in the answer booklet provided and don't remove any sheetfrom it

EXAMINER: **MODERATOR:**

HABANABAKIZE Théophile. **……**

Section A: Attempt all questions/ 40 Marks

1. What do you understand by ‘‘**Piping System’’**? **/2 Marks**
2. Name any five piping system components **/5 Marks**
3. What are the different fittings used in piping systems? **/4 Marks**
4. What is the purpose of valves in a piping system? **/2 Marks**
5. What is the importance of pipe insulation? **/2 Marks**
6. What is the purpose of pipe supports? **/4 Marks**
7. Differentiate Laminar from Turbulent flow. **/2 Marks**
8. A steel pipe with a length of 10 meters and a diameter of 0.5 meters is subjected to an internal pressure of 200 psi. Calculate the stress experienced by the pipe. **/3 Marks**
9. Determine the total head loss in a piping system with three pipes in series, each having a length of 50 meters and a diameter of 0.2 meters. The flow rate is 0.5 m^3/s, and the friction factor is 0.02. **/3 Marks**
10. A pump delivers water at a rate of 0.1 m^3/s through a pipe with a diameter of 0.3 meters. Calculate the velocity of the water in the pipe. **/3 Marks**
11. Differentiate Piping system preventive from breakdown maintenance
12. What are the five challenges are more likely to happen after piping system maintenance? **/5 Marks**

Section B: Attempt any two questions/ 20 Marks

13. a) What do you understand by ‘‘ Pressure drop Darcy-Weisbach equation’’/**3 Marks**

b) Name all parameters involved in the Pressure drop Darcy-Weisbach equation/**5 Marks**

c) Write down Pressure drop Darcy-Weisbach equation. **2 Marks**

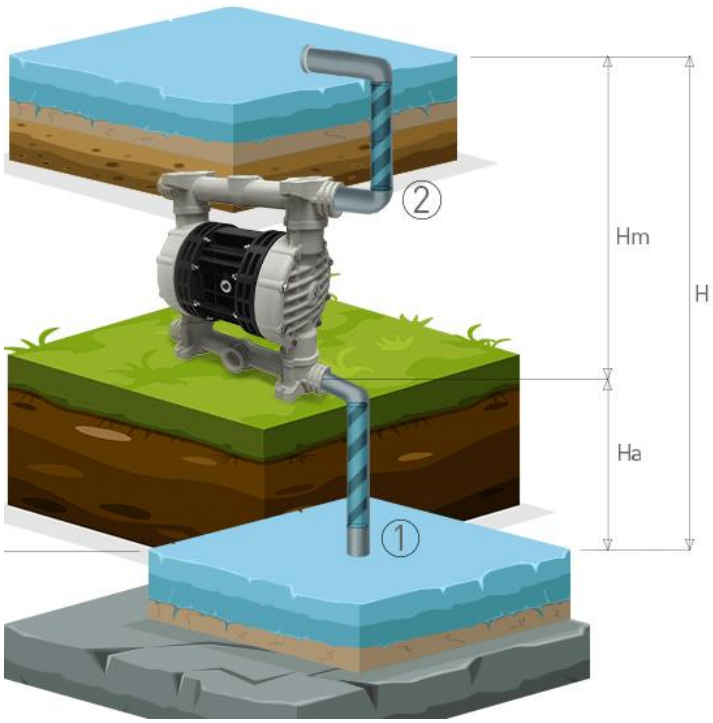
14. a) List five variables/parameters to put into consideration in the selection of pipe. **/5 Marks**

b) Give two examples of ferrous pipes and three examples of non-ferrous pipe **/5Marks**

15. a) Explain **Pump Head /2 Marks**

b) Calculate the pump head for water pumping system of the Pipe diameter: 0.4 meters, Fluid velocity: 5 m/s, Elevation at point 1: 10 meters and Elevation at point 2: 5 meters. /**3 Marks**

c) Name all indicated parts of an operating diagram of a pumped water lifting system /**5 Marks**



16. Match the tools to their specific function from the table below: /**10 Marks**

Tools	**Function**
1. Pipe vice	**a)** Used for cutting pipes, and other piping system-related materials like: bolts and nuts.
2. Pressure test gauge	**b)** Used to fasten and fix pipes with structures to provide support, to provide fast, safe, economical service and installation in a piping system, and to absorb shock, dampen vibration, and reduce noise.
3. Hacksaw	**c)** Equipment that is used to cut threads onto the end of a pipe
4. Pipe threading machine	**d)** Used to indicate the amount of liquid, gas, or vapour moving through a pipe or conduit by measuring linear, non-linear, mass, or volumetric flow rates.
5. Thermometer	**e)** Used to hold a pipe so that it can be cut, threaded, and welded.
6. Pipe clamps	**f)** Used to tighten and loosen the nuts/fittings that hold pipes together
7. Flow meter	**g)** Used to check for leaks and fluid pressure problems
8. Pipe bender	**h)** Used to bend piping of different materials and sizes, such as copper and stainless steel, to form various angles and curves
9. Pipe Wrench	**i)** Used for measuring temperature
10. Pipe bender	**j)** A tool used to bend piping of different materials and sizes, such as copper and stainless steel, to form various angles and curves