MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ENGINEERING AND TECHNOLOGY

UNIVERSITY ORDINARY EXAMINATION

2021/2022 ACADEMIC YEAR

THIRD YEAR **FIRST** SEMESTER EXAMINATION FOR, DIPLOMA IN CIVIL ENGINEERING

SEB 1311: HYDRAULICS III

DURATION: 2 HOURS

TIME:

Instructions to candidates:

1. Answer question One and Any Other Two questions.

2. Mobile phones are not allowed in the examination room.

3. You are not allowed to write on this examination question paper.

SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)
a) Define the following terms as used in hydraulics

    i)   Steady uniform flow
   ii)   Loss of head
    iii)   Hydraulic grade line

                                                                        (6 marks)

b) Using a well-illustrated sketches differentiate between lamina and turbulent flow.   (6 marks)
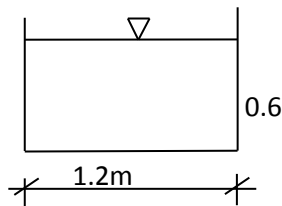
c) Explain the classifications of loss of head in pipeline.   (6 marks)

d) A rectangular channel is 4m deep and 6m wide. Calculate the discharge through the channel when it runs full. Take slope of bed as 1:1000 and chezzy's constant
    C= 50
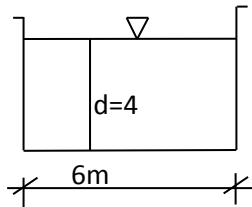
                                                                        (6 marks)

e) Calculate the rate of flow in the following.

C=58

Slope=1:30

                                                                        (6 marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION
QUESTION TWO (20 MARKS)

2. A horizontal water pipe enlarges from 75mm diameter to 150mm diameter. The flow through the pipe is $0.03m^3$/s. Calculate:
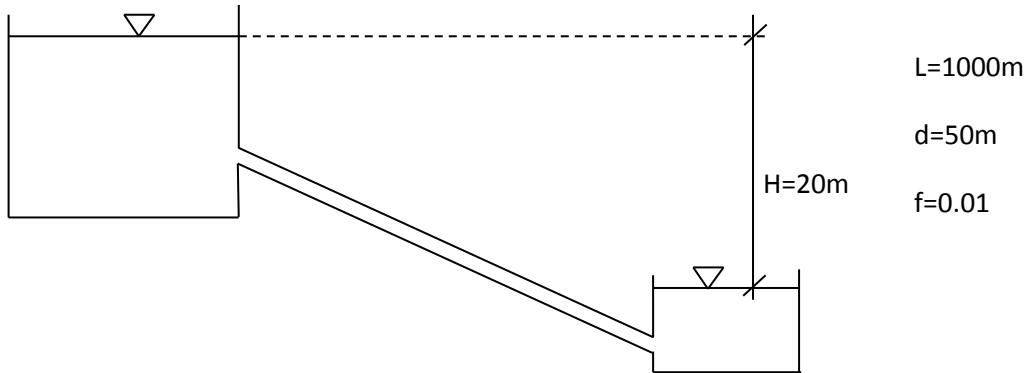
    i)   Loss of head due to expansion
    ii)   Pressure head in enlarged portion given pressure head at smaller portion is 3.6m.
    iii)   The deflection in a U tube mercury manometer if taped between the smaller and larger diameter portion.

                                                                        (20 marks)

QUESTION THREE (20 MARKS)

3. Using the system shown below, calculate the rate of flow by considering.

    i.   Only major losses
   ii.   All loses

L=1000m

d=50m

H=20m

f=0.01

QUESTION FOUR (20 MARKS)

    4. Calculate the rate of flow in the pipe system below

L_1=1000m

d_1=100m

H=27m

f_1=0.01

1

L_2=5000m

2

d_2=200m

f_2=0.01

0.6

C=58

(20 marks)

1.2m

Slope=1:30