

$P = \frac{F}{A}$ N/m²



W1-2-60-1-6
JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS 2016/2017
THIRD YEAR SECOND SEMESTER SUPPLEMENTARY/ SPECIAL
EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN LAND
RESOURCE PLANNING AND MANAGEMENT
ALP 2305 IPRINCIPLE OF FLUID MECHANICS

DATE: _____ **TIME 2 HOURS**

INSTRUCTIONS:

- This paper has four questions
- Answer question compulsory (40 Marks) and any two questions (30 Marks Each)
- Read and follow the instructions on your examination answer booklet

1. (i) Define the following terms (3 Mark each)

- a. Hydraulics (5 Mks)
- b. Dynamic viscosity (5 Mks)
- c. Bulk modulus (5 Mks)
- d. Newtonian fluid (5Mks)

(ii) With help of a diagram differentiate Manometer and bourdon gauge as applied in fluid mechanics. (20 Mks)

2. (a) Determine in Newton per square metre the increase of pressure intensity per meter depth in fresh water (Mass density of water is 1000kg/m³.) (15 Mks)

(b) Find the intensity pressure of water corresponding to head of 35 m ($W=9.81 \times 10^3$ N/M³) (15 Mks)

3. (a) A pump delivers water against a head of 15m of water. It also raises the water from a stream to the pump against a suction head equal to 250mm of mercury. Convert these head into N/m² and find the total head against which the pump works in N/m² and meters of water. (15 Mks)

(b) With a help of an illustration explain the Manning's equation of open channel flow. (15 Mks)

4. Describe five general mechanical properties of fluids explaining their mathematical relations where applicable. (30 Mks)