

Ollscoil na hEireann, Gaillimh
National University of Ireland, Galway

SUMMER EXAMINATIONS 2000

FIRST CIVIL ENGINEERING EXAMINATIONS
FIRST UNDENOMINATED ENGINEERING EXAMINATIONS

FUNDAMENTALS OF CIVIL ENGINEERING

Professor R. Falconer;
Professor P. E. O'Donoghue

Time allowed: two hours

Answer 4 Questions

1. What are the main features of a pin-jointed truss and describe the possible support conditions (6 marks).
Find the forces in the members of the pin-jointed truss shown in Figure 1 (14 marks).

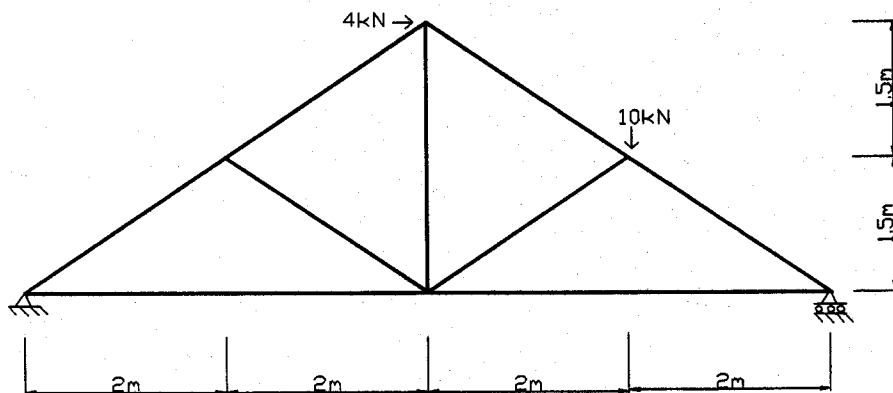


Figure 1

2. Distinguish between

- (i) Dead load and Live load (4 marks)
- (ii) Static loads and Dynamic loads (4 marks)
- (iii) Point loads and distributed loads (4 marks)
- (iv) Stress and strain (4 marks)
- (v) Laminar flow and Turbulent flow (4 marks)

3. A small rectangular plate, 1 m high and 0.25 m wide, is used to dam an irrigation stream. A layer of silt, 0.25 m deep with a specific weight twice that of water, has accumulated at the bottom (20 marks). Determine the magnitude and line of action of the resultant force exerted on the plate by both the silt and the water when the water is level with the top of the plate (20 marks).

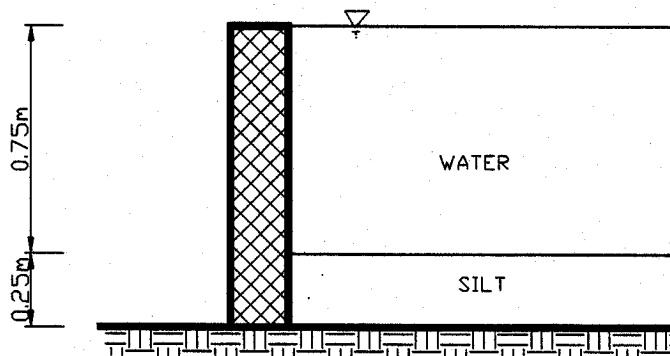


Figure 2

4. Discuss the role of the transportation engineer in relation to providing a transport network to meet the demands of modern society (20 marks).
5. (a) Discuss the significance of adding carbon to iron (8 marks).
- (b) In relation to the use of concrete as an engineering material, discuss
- (i) Concrete mixes (3 marks)
 - (ii) Workability (3 marks)
 - (iii) Curing (3 marks)
 - (iv) Slump Test (3 marks)