JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

UNIVERSITY EXAMINATIONS FOR THE DIPLOMA IN CIVIL ENGINEERING (TVET)

1ST YEAR 2ND SEMESTER 2023/2024 ACADEMIC YEAR

CENTRE: MAIN CAMPUS

COURSE CODE: TDE 2123

COURSE TITLE: STRUCTURAL DESIGN AND ANALYSIS

EXAM VENUE: **STREAM: Dip CIVIL ENGINEERING**

DATE: ../04/2024 **EXAM SESSION:**

DURATION: 2 HOURS

Instructions

1. **Answer ALL questions in Section A (Compulsory) and ANY other three questions in Section B**
2. **Candidates are advised not to write on question paper**
3. **Candidates must hand in their answer booklets to the invigilator while in the examination room**

SECTION A (30 Marks)

1. a Explain why it's important to do structural design and analysis of a structural loads. (3 Marks)

b. State five types of loads on a structure may experience. (5 Marks)

c. (i) By use of sketches state and define 3 types of stresses. (9 Marks)

d. (i) Define strain.

(ii) By use of sketches state and define 3 types of strain. (9 Marks)

e. State the Hooke's law. (2 Marks)

f. Show the relationship between stress, strain and elastic modulus. (2 Marks)

SECTION B (40 Marks)

2. a) Define a beam. (2 Marks)

b) State four factors that determine the amount and extent of external load a beam can carry. (4 Marks)

c) Define: (2 Marks)

(i) Clear span

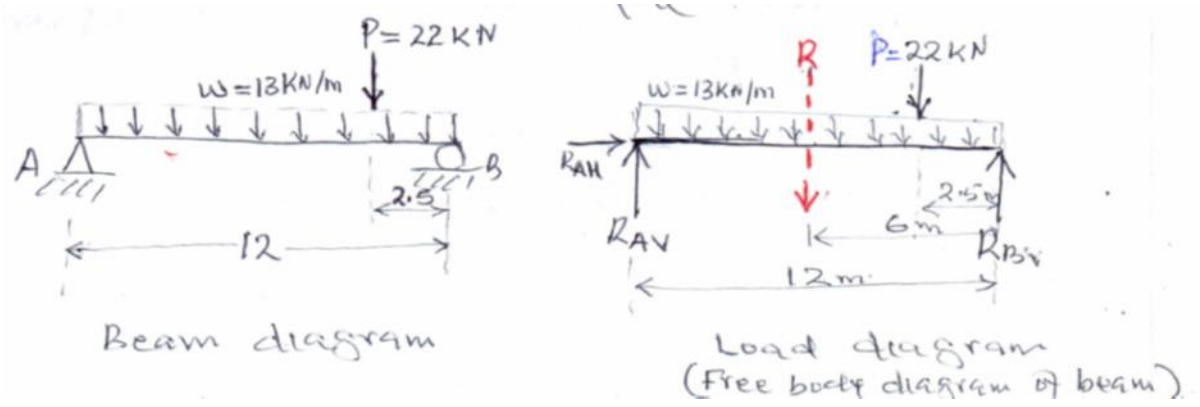
(ii) Effective span

d) By use of sketches state and explain 4 types of beam. (8 Marks)

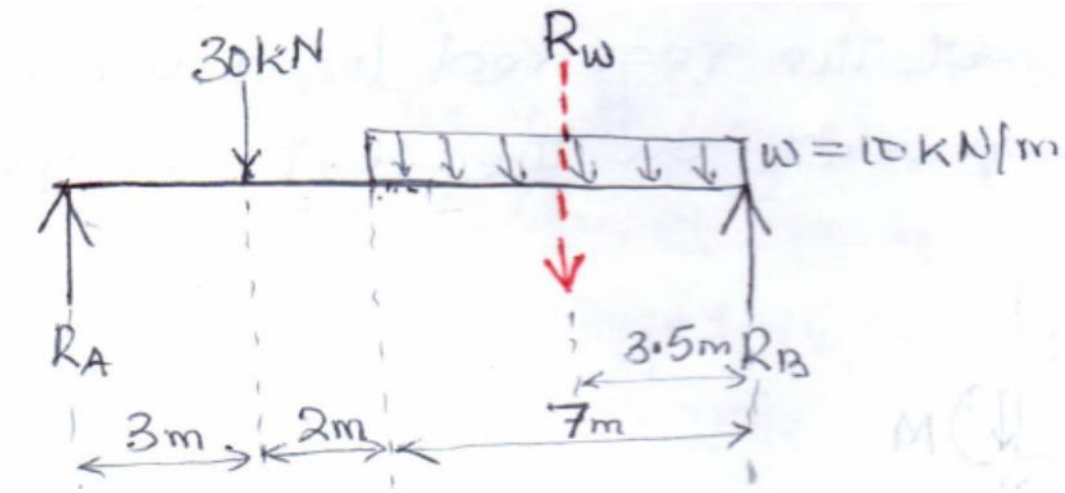
e) State and explain two types of beam loading. (4 Marks)

3. a) Draw the stress and strain curve then explain the stages on the stress strain curve. (10mks)

b) Compute the external reactions. (10 Marks)



4. Compute the shear force and bending moments at: (i) 2m (ii) 9m from the left end of the beam. (20mks)



5. Draw the shear diagram and bending moment for the diagram drawn below. (20mks)