MACHAKOS UNIVERSITY

FIRST YEAR SECOND SMESTER SUPPLEMENTARY/SPECIAL EXAMINATION FOR DIPLOMA IN CIVIL ENGINEERING

STRENGTH OF MATERIALS 1

BCE CD 119

TIME 2 HOURS

INSTRUCTIONS

QUESTION ONE IS COMPULSORY AND CARRIES 30 MARKS.

ANSWER ANY OTHER TWO QUESTIONS.

Q1a) State two assumptions of the theory of simple bending (8mks)

b) Define the following terms

i)Stress

ii) Strain

iii) second moment of area

vi) Radius of Gyration

V) Modulus of elasticity

vi) Section Modulus

viii)Slenderness ratio ( 14mks)

c)state the assumptions of used in deriving the Euler buckling /crippling load (8mks)

Q2) For the figure 1 show, calculate the reactions and draw the shear force and bending moment diagram (20mks)

Q3a) with the aid of a diagram, show that r=b/√2 ( 10mks)

b) Illustrate the stress- strain gragh of mild steel bar showing all the limits until it failures (10mks)

Q4a) with the aid of diagram, describe four types of supports 10mks)

b) with the aid of diagrams,sketch four types of loading systems 10mks)

Q5) Calculate the second moment of area,the radius of gyration ,and the section modulus of with respect to x-axis in the figure 2 shown.
(20mks)