TECHNICAL UNIVERSITY OF MOMBASA

FACULTY OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF BUILDING & CIVIL ENGINEERING

UNIVERSITY EXAMINATION FOR:

DIPLOMA IN CIVIL ENGINEERING

EBC 2208 : STRENGTH OF MATERIALS II

END OF SEMESTER EXAMINATION

SERIES: AUGUST 2019

TIME: 2 HOURS

DATE: Pick Date Aug 2019

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass, scientific calculator and student ID

This paper consists of **FIVE** questions. Attempt any THREE questions.

Do not write on the question paper.

Question One

A masonry wall is as shown in fig. 1 and it weighs 20KN/m^2.It retains water on its vertical face. Calculate the pressure at the base of the wall. (20 marks)

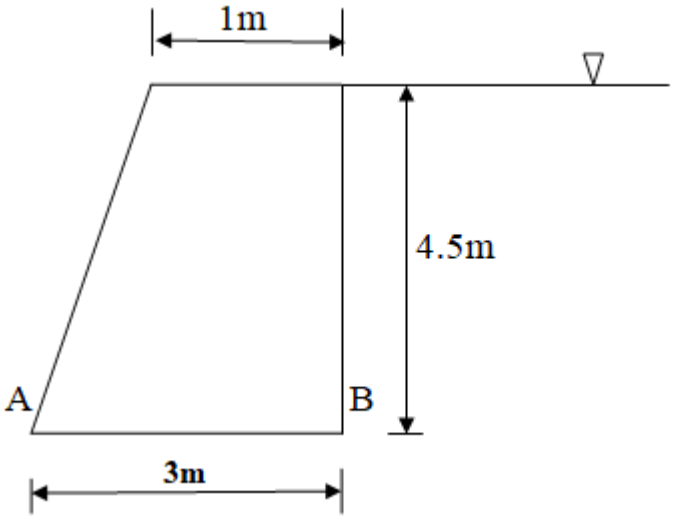

Fig. 1

Question Two

Figure 2 shows a loaded cantilever beam and its section. Sketch the horizontal shear stress distribution across the section of the beam at the support showing critical values. (20 marks)

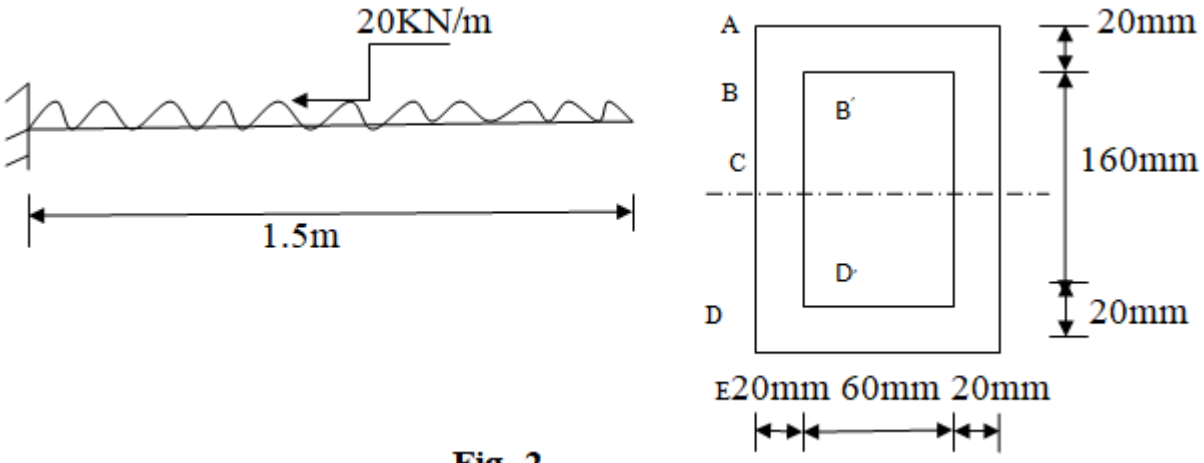

Fig. 2

Question Three

(a) State Five assumptions made in the theory of simple bending (5 marks)

(b) Figure 3 shows an elevation and a section through a cantilever beam, the beam is of span 1.6m and carries a uniformly distributed load of intensity W KN/unit length along the full length of the top flange. If the maximum tensile and compressive stresses are not to exceed 35KN/mm^2 and 100N/mm^2 respectively, determine ;

(i)The allowable uniformly distributed load 'w' on the beam

(ii)The maximum deflection in (i) above, Take E = 210KN/mm^2 (15 marks)

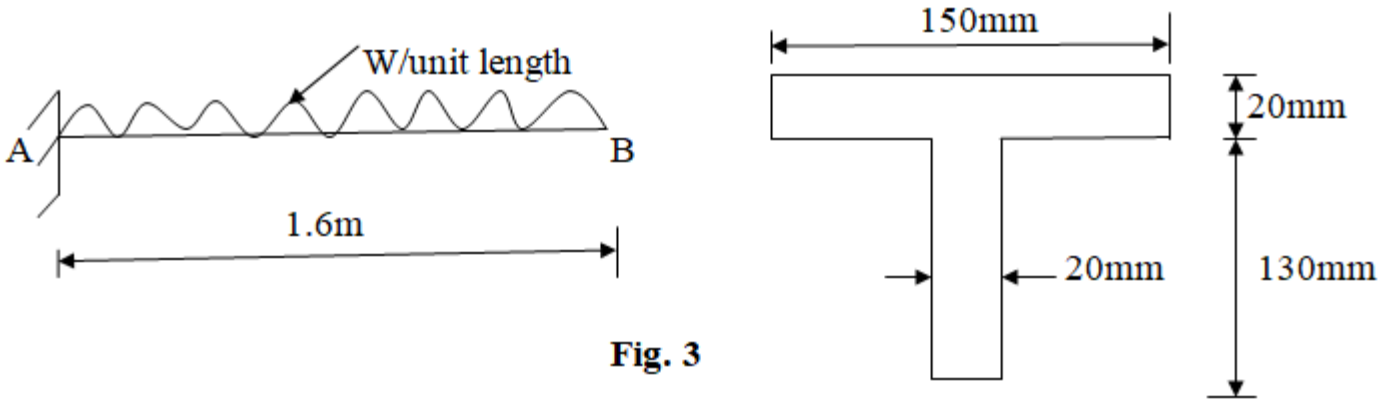

Fig. 3

(a) Elevation of beam (b) Beam section

Question Four

Figure 4 shows a flinched beam consisting of two timber joists 200mm x 75mm and a steel plate 150mm x 10mm securely bolted between them. The beam is simply supported on a span of 6m and carries an inclusive uniformly distributed load of 900N/m.Calculate the maximum tensile and compressive stresses in both materials is due to this load. (20 marks)

$E_{steel} = 210KN/mm^2$ $E_{timber} = 8.75KN/mm^2$

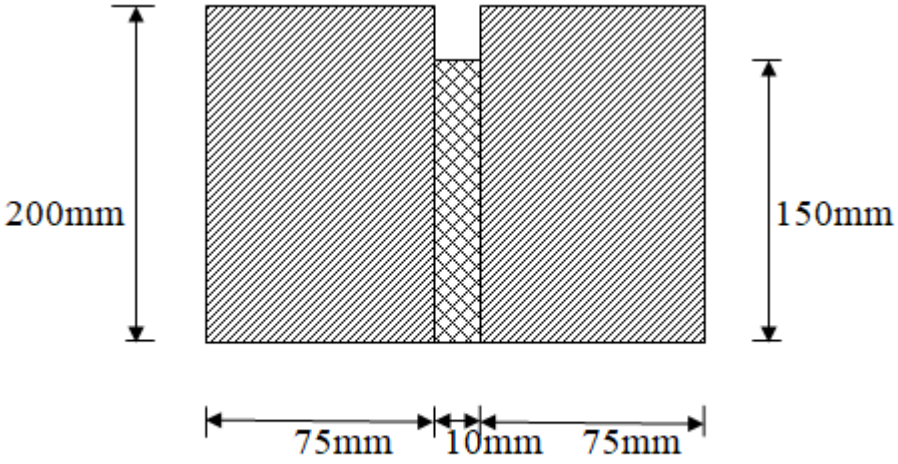

Fig. 4

Question Five

An ornamental beam shown in fig. 5 has a span of 4m and carries a uniformly distributed load of 2000N/m inclusive of its weight. Determine the maximum shear stress in the cross-section and sketch the shear stress variation diagram for the section. (20 Marks)

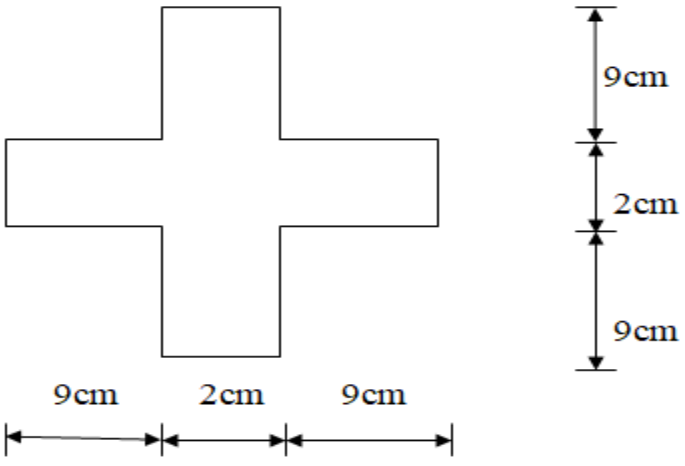

Fig. 5