Paramjais SM-(3)

GOVERNMENT COLLEGE OF ENGINEERING, YAVATMAL

Department Of Civil Engineering

Academic Year 2021-22

MID- Semester Examination (~~Odd~~/Even – 2021-22)

Course: CIVIL. Engg **Semester : VI**

Subject : SM- I (BTCVC 403)

Duration: 1:00 Hr. **Date: 24/05/2022** **Marks : 20**

Instructions:

(1) All questions are compulsory.
(2) Illustrate your answers with neat sketches wherever necessary.
(3) Figures to the right indicate full marks.
(4) Assume suitable data if necessary.
(5) Preferably, write the answers in sequential order.

Q.1 Attempt any TWO. **(Marks – 08)**

a) A 3m long cantilever of uniform c/s, 150mm X 300mm is loaded with 30kN load at it's free end. In addition to this it carries UDL of 20kN/m over entire length . Calculate maximum slope & Deflection. Take, E= 210Gpa. Solve by Double Integration Method. **(04)**

$\gamma = 3.82 \times 10^{-2}$

b) A beam of uniform section 6m long & S.S. at it's ends. It carries Concentrated load of 12kN & 6kN at a distance 2m & 4m resp. from the right support. Find Deflection under each load. Take, $E=2 \times 10^5$ Mpa, $I= 60 \times 10^6$ mm^4, use Macaulay method. **(04)**

$C_1 = 26$ 4.33×10^{-12} mm

c) Also Determine Maximum deflection in above question i.e.(Q.1) b) **(04)**

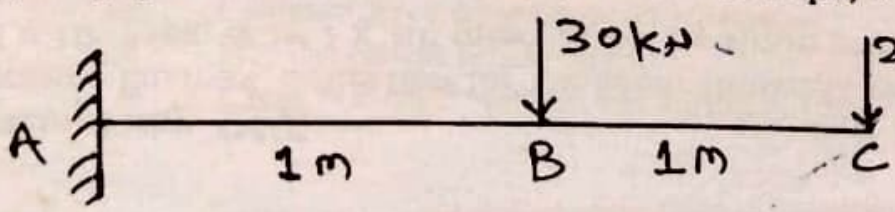
Q.2 Attempt any ONE . **(Marks – 06)**

a) A beam of uniform c/s 200mm x 300mm is S.S. at it's ends. It carries a UDL of 9kN/m over the entire span of 5m. if the value of E= 1 x 10^4Mpa, Calculate 1)Slope at supports, 2)Max. deflection. Solve by double integration method. **(06)**

$\gamma = 4.88 \times 10^{-6}$
$\delta = 8.12 \times 10^{-3}$

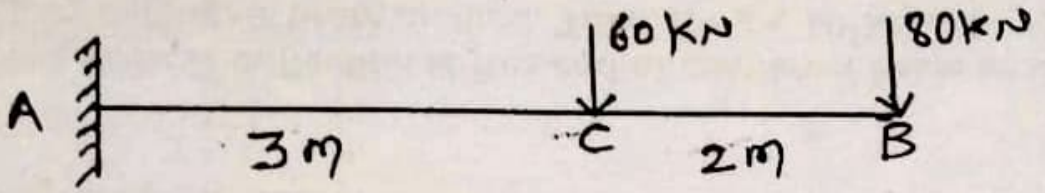
b) Find slope & deflection at free end of cantilever beam as shown in below fig. by conjugate beam method. Take, E= 2 x 10^5Mpa, I= 15650cm^4. **(06)**

3.19×10^{-5}



Q.3 Attempt any ONE **(Marks – 06)**

a) Determine the max. deflection for the beam shown in below fig. Assume $E = 2 \times 10^5$ Mpa, & $I = 1 \times 10^9$ mm^4, Solve by strain principle. **(06)**



b) Derive an expression for strain energy due to Bending. **(06)**

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