

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**BArch- SEMESTER- 3 EXAMINATION – SUMMER 2016**

**Subject Code: 1035003**

**Date: 12-05-2016**

**Subject Name: Structure III**

**Time: 02.30PM – 04.30PM**

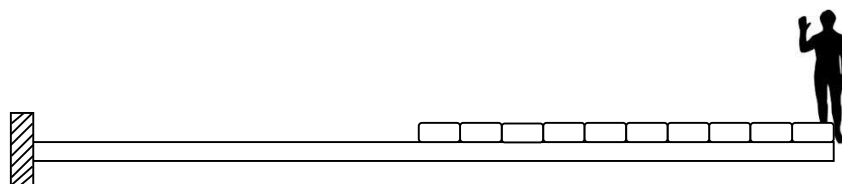
**Total Marks: 50**

**Instructions:**

1. Attempt all questions.
2. Make suitable sketches wherever necessary.
3. Figures to the right indicate full marks.

**Q.1 (A)** i) Define Radius of gyration **05**  
ii) Define Crippling Load, Buckling Load, Critical Load

**(B)** 0.1 m long cement bag of 200 kg have equally spread over the end half span of a **10**  
2 m long cantilever bridge due to some accident. Assume there is no space between those bags and they are laid down immediately one after another. A thousand kg wrestler is standing at the end of the cantilever. Find slope and deflection at free end. Cross section of beam is 100 mm width X 180 mm depth.  $E = 200 \text{ GPa}$



**Q.2 (A)** Derive effective length for the cantilever **05**

**(B)** A short column has rectangular section of 0.25 m width and 0.2 **10**  
m. At a point 0.05 m from longer side and 0.01 m from shorter side, A scare crow of 4,00,000 N is kept. Find maximum and minimum stresses in the column.

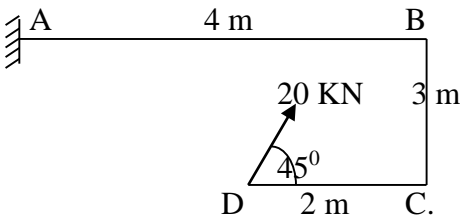
**OR**

**(B)** 8000 mm long column, an 'I' section, has 0.26 m depth and 120 **10**  
mm width. Thickness of flange and web is 1 cm. It is used as a column with one end fixed and other hinged. Determine safe load with Euler's formula keeping factor of safety as 6.  $E = 2 \times 10^5 \text{ N/mm}^2$ .

**Q.3 (A)** Define Strain energy and Resilience **05**

**(B)** Advantages and disadvantages of indeterminate Structures **05**

(C) i) Draw SFD, BMD, AFD, FBD for given figure 08



ii) Define Long Column and short column. 02

**OR**

C) A fixed beam of 6 m span carries U.D.L of 25 kN/m over its entire span and 80 kN at centre. Draw S.F and B.M diagrams for the beam. Also find point of Contra flexure. 10

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