Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE ARCH – SEMESTER – III • EXAMINATION – SUMMER • 2015**

**Subject Code: 1035003** **Date: 14-05-2015**

**Subject Name: Structure - III**

**Time: 02:30 pm - 04:30 pm** **Total Marks: 50**

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**Important Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Draw neat sketches where required.**
4. **Figures to the right indicate full marks.**
5. **If more options are attempted, then, highest scoring answers will be considered.**

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**Q.1** Analyze the fixed beam given in figure 1. Calculate and Draw SFD and BMD for the beam. **12**

**OR**

**Q. 1** Analyze the continuous beam given in figure 2. Calculate and Draw SFD and BMD for the beam. **12**

Figure 1

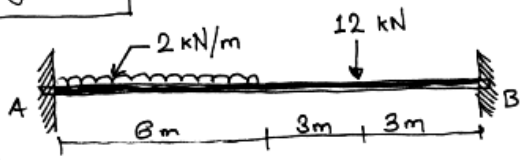
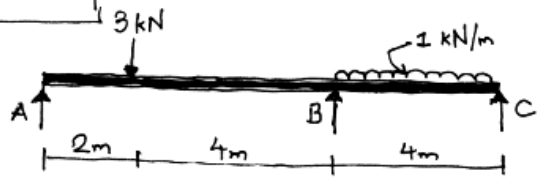



Figure 2




**Q.2.** Explain Euler's Column Theory and assumption for the same. **10**

**Q. 3**. Define Slenderness ratio and explain the failures of Long column and short column **8**

**OR**

**Q.3**. Define Rakine's formula for Columns and explain Euler's Crippling Load **8**

**Q.3.** Solve/answer (**any two)** of the following problems: **(10 marks each) 20**

1. An alloy hollow circular column of 200mm external and 160mm internal diameter is 5m. Long and fixed at both ends. It is subjected to a load of 120kN at an eccentricity of 20mm from the geometrical axis. Determine the maximum stress induced in the column section. Take *E as 120 GPa (120 N/mm$^2$)*
2. A steel rod 5m long and of 40mm diameter is used as a column, with an end fixed and other free. Determine the crippling load by Euler's Formula. Take *E as 200.*
3. Discuss 'Equivalent Length of a Column' for different end conditions, their relations and Crippling Load.

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