

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III (OLD) - EXAMINATION – SUMMER 2017****Subject Code: 131304****Date: 09/06/2017****Subject Name: Basics of Structural Engineering****Time: 10:30 AM to 01:00 PM****Total Marks: 70****Instructions:**

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

- Q.1** (a) Analyze the continuous beam shown in figure 1 by moment distribution method, and plot shear force and bending diagram both. **14**
- Q.2** (a) A simply supported beam 4 m in span carries udl of 10kN/m. Find the maximum slope and deflection of the beam. Take $I = 12 \times 10^6 \text{ mm}^4$ and $E = 200 \text{ GPa}$. **07**
- (b) A simply supported beam of 2 m span carries load of 20 kN at its mid point. Determine the maximum slope and deflection of the beam. Take flexural rigidity of the beam as $500 \times 10^9 \text{ N-mm}^2$ **07**
- OR**
- (b) Explain the creep of the concrete and factors affecting it. **07**
- Q.3** (a) What do you mean by the kernel of the section? Derive the kernel of the rectangular and solid circular section. **07**
- (b) A rectangular column applied 60 kN load at $e_{xx} = 100 \text{ mm}$, and $e_{yy} = 100 \text{ mm}$. If the dimension of the rectangular section is $800 \times 600 \text{ mm}$, determine the stress at each corner. **07**
- OR**
- Q.3** (a) A masonry chimney of the hollow circular section having external and internal diameter 2 m and 1.5 m respectively, is subjected to horizontal wind pressure of 1.6 kN/m^2 . If the height of the chimney is 8 m determine maximum and minimum stress at the base. Take specific weight of chimney 20 kN/m^3 **07**
- (b) A concrete dam of rectangular section 15 m high and 6 m wide contains water up to a height of 13 m. Determine the maximum and minimum intensities of stress at base. Assume the unit weight of water and concrete as 10 kN/m^3 and 25 kN/m^3 , respectively. **07**
- Q.4** (a) Enlist different 5 types of cement and describe any one of them in detail. **07**
- (b) Explain different methods of mixing and placing of concrete. **07**
- OR**
- Q.4** (a) What is curing? Explain water curing in detail. **07**
- (b) How do the size, shape, texture and strength of aggregate influence the property of concrete? **07**
- Q.5** (a) What do you mean by compaction of soil? Describe laboratory test of compaction of soil **07**
- (b) Explain liquid limit, plastic limit, and shrinkage limit and plasticity index. **07**
- OR**
- Q.5** (a) Define permeability of soil. Enlist factors affecting permeability and describe any two in detail. **07**
- (b) Explain any one laboratory test to determine the shear strength of soil **07**


