

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE SEM-III Examination-Dec.-2011

Subject code: 131304

Date: 15/12/2011

Subject Name: Basics of structural Engineering

Time: 2.30 pm -5.00 pm

Total marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of Programmable calculator is strictly prohibited.
5. Draw neat sketch wherever necessary.

- Q.1** (a) Enlist different types of cement and explain any two of them. **07**
(b) What is the influence of classification of aggregate on concrete properties ? **07**

- Q.2** (a) Define the following **07**
(i) Specific gravity (ii) Void ratio (iii) Porosity
(iv) % air voids (v) Air content (vi) Moisture content
(vii) Degree of saturation
(b) Derive following relationship **07**
(i) between G, w, e and S_r .
(ii) between γ_b, G, w, e and γ_w .

OR

- (b) The falling head permeability test was conducted on a soil sample of 4 cm diameter and 18 cm length. The head fell from 1.0 m to 0.4 m in 20 minutes. If the cross sectional area of stand pipe was 1 cm^2 , determine the coefficient of permeability. **07**
- Q.3** (a) A saturated sample of undisturbed inorganic clay has a volume of 19.2 cm^3 and mass 32.5 gm. After oven drying at 105°C for 24 hours, the mass reduces to 20.9 gm. For the soil in the natural state find $w, G, e, \gamma_{\text{sat}}$ and γ_d . **07**
(b) Explain about factors affecting permeability. **07**

OR

- Q.3** (a) Distinguish between standard proctor test and modified proctor test. **07**
(b) Give assumption's made in Terzaghi's bearing capacity theory. **07**

- Q.4** (a) Show with neat sketches , core for the following section **07**
(i) 300 x 450 mm rectangular section
(ii) 400 mm dia circular section
(iii) hollow circular section with 500 mm outer dia and 300 mm inner dia.
(b) A rectangular column of 300 mm x 200 mm carries a point load of 200 kN at an eccentricity of 60 mm on the axis bi-secting the width. Determine maximum and minimum stress intensities on the section. **07**

OR

- Q.4** (a) State various methods of curing and explain steam curing in detail **07**
(b) Write short note on Advantages of use of Admixture in concrete Or Write short note on Durability of concrete. **07**

- Q.5** (a) A trapezoidal masonry dam is of 18 m height. The dam is having water upto a depth of 16 m on its vertical side. The top and bottom width of the dam are 4 m and **07**

8 m respectively. The weight density of dam is 20 kN/m^3 . Determine the maximum and minimum stress intensities at the base.

- (b) Draw BMD for the beam ABC shown in Fig-1 using Moment Distribution method. **07**

OR

- Q.5** (a) Calculate slope and deflection at point C for a cantilever beam as shown in Fig-2. **07**

- (b) Enlist physical tests of cement. How will you get the initial and final setting time of cement. **07**

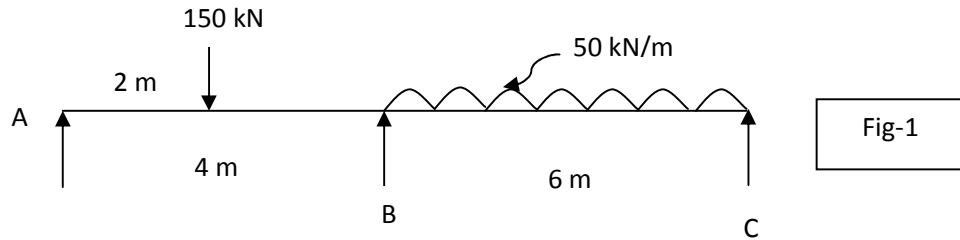


Fig-1

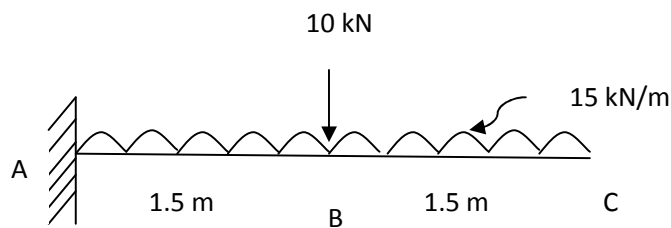


Fig-2