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BCE-036

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Diploma in Civil Engineering

Term-End Examination

June, 2011

BCE-036 : SOIL, ROADS AND AIRFIELDS

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **five** questions in all. Question no. **1** is **compulsory**. Use of calculator is **allowed**. Graph papers may be supplied on request.*

1. Fill in the blanks : **7x2=14**

(a) If the voids of a soil mass are full of air only, the soil is termed as _____ .

(b) When the degree of saturation is zero, the soil mass under consideration represents _____.

(c) Sheep - foot rollers are recommended for compacting _____ .

(d) Load bearing property is measured by the _____ .

(e) Hanger is the large span shed erected at the airport for the purpose of storing, servicing and _____.

(f) Bottom most layer of pavement is known as _____ .

(g) The difference between liquid limit and plastic limit _____ .

2. A soil is saturated at 62 percent moisture content and has a unit weight of 16.0 kN/m^3. Calculate its void ratio, specific gravity, dry unit weight and submerged unit weight. 1

3. What do you understand by soil classification. Define various types of textural classification or Engineering classification. 1

4. Explain difference between compaction and consolidation. Explain factors affecting compaction. 1

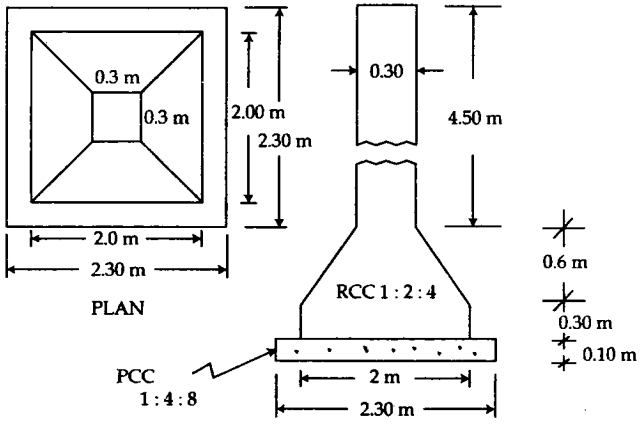
5. What are the advantages of photographic surveys in highway location ? Describe briefly the photographic survey technique for aligning roads. Explain the requirement of drainage studies for road projects. 1

6. What do you understand by soil stabilisation ? Why is it necessary to adopt soil stabilisation ? What are the properties of soil lime mixtures and what factors affect them ? 1

7. Explain functions of Elevator, Rudder and Aileron. Explain the commonly used terms in connection with the weight of an aircraft. 1

8. Explain the ICAO recommendations on runway length, width and gradients. Explain the necessity of airport classification. **14**

(b) Calculate the Quantity of P.C.C. 1 : 4 : 8 in foundation and RCC 1 : 2 : 4 in the column given in the drawing.



3. Prepare a detailed estimate of an underground trapezoidal water tank only for earthwork, which is excavated in a level ground to a depth of 4.00 m. The top of the tank is rectangular having dimension as 30.00 m × 20.00 m. Side slope of tank is $1\frac{1}{2}$: 1. The rate of earthwork in excavations is Rs. 1000/ % cum. **14**

4. Prepare the Analysis of rate for following items of works (***any two***) : **7x2=14**

   (a) Sal wood frame wrought, framed and fixed of section 8.00 × 12.00 cm for door size 2.17 × 1.23 m

(b) Ist class Brick work 1 : 4 in CM

(c) RCC 1 : 2 : 4 in slabs

(d) Plastering 1 : 3 in ceiling

5. Write down detailed specifications of *any two* items of works. **7x2=14**

(a) Distempering on walls.

(b) Plain Cement Concrete 1 : 4 : 8 in buildings.

(c) 12 mm thick plastering 1 : 6 on new wall.

(d) Wood work and Glazing in doors and windows.

6. Work out Quantity of RCC and reinforcement for an RCC beam of size 250 mm × 500 mm which is used over a clear span of 5.00 m. It has 300 mm bearing on both sides. There are 3 main bars of 25 mm ϕ, one of them bent up at 47 at 45°. There are two anchor bars 10 mm ϕ at the top. The Beam has 8 mm ϕ rings @ 300 mm c/c throughout the length. **14**

7. Write short notes on *any four* of the following : **3½x4=14**

(a) Format of Bill of Quantity

(b) Types of pointings

(c) Types of Contract

(d) Irregularities in MB

(e) Lead and lift

(f) Contract System