GUJARAT TECHNOLOGICAL UNIVERSITY
B.E. Sem-I   Examination January 2010

Subject code:110004   **Subject Name: Elements of Civil Engineering**
Date: 05 / 01/ 2010   **Time: 11.00 am – 1.30 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)** i) Define: Perpendicular offset and oblique offset   **02**
            ii) Explain the procedure of reciprocal ranging   **05**
      (b) A line was measured with a steel tape which was exactly 30m long at   **07**
            18^0 C and found to be 452.343m. The temperature during measurement
            was 32^0C. Find the true length of line. Take coefficient of expansion
            of the tape per ^oC =0.0000117

Q.2 **(a)** What are the effects of the earth's curvature and the atmospheric   **07**
            refraction in leveling? Derive the expression for the correction for
            curvature.
      (b) Find the correction for curvature for a distance of (1) 800m. (2) 2.5km.   **07**
                                        OR
      (b) The following consecutive readings were taken with a level and 5   **07**
            metre leveling staff on continuously sloping ground at a common
            interval of 20mt. 0.385; 1.030; 1.925; 2.825; 3.730; 4.685; 0.625;
            2.005; 3.110; 4.485. The reduce level of the first point was 208.125mt.
            Rule out a page of a level field book and enter the above readings.
            Calculate the reduced levels of the points by rise and fall method. Also
            find the gradient of the line joining the first and last point.

Q.3 **(a)** i) Explain the magnetic declination   **03**
            ii) The magnetic bearing of a line AB is $S28^0$ 30' E.   **04**
               Calculate the true bearing if the declination is 7^0 30'w.
      (b) Draw the neat sketch for the following.
            i) Sectional plan of a ledged and battened door.   **03**
            ii) One-way R.C.C. slab (longitudinal section) for 4mt. span.   **04**
                                        OR
Q.3 **(a)** Explain the procedure to find the area of irregular figure by planimeter. **07**
            Also discuss the multiplier constant (M).
      (b) Calculate the area of a figure from the following readings by a   **07**
            planimeter with anchor point inside the figure.
            Initial reading = 7.875
            Final reading = 3.086
            $M = 100cm^2$ C = 23.521

Q.4 **(a)** Explain mortar, classify it. Explain in detail the cement mortar.   **07**
      (b)   Write notes on:
            i) Properties of hardened concrete   **04**
            ii) Requirements of good paints
                                        OR

Q.4 **(a)** State the factors for selecting the site for a residential building. Also state the layout plan of an industrial building.   **07**

(b) Explain the watershed development and its significance.   **07**

Q.5 **(a)** State the different tests on bitumen and describe how the ductility test is performed in the laboratory.   **07**

(b) State and explain the components of GIS.   **07**

OR

Q.5 **(a)** Discuss the advantages of the 'Critical Path Method' for scheduling and construction management.   **07**

(b) Write short notes on:
i) Grillage foundation.   **04**
ii) Site plan and key plan.   **03**

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