

Seat No.: _____

Enrolment No. _____

(EC-7)

GUJARAT TECHNOLOGICAL UNIVERSITY

B.E. all Sem-I Examination December 08/January 09

Elements of Civil Engineering (110004)

DATE: 29-12-2008, Monday

TIME: 12.00 to 2.30 p.m.

MAX. MARKS: 70

Instructions:

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

Q.1 **14**

- (a) Discuss the impact of infrastructural development on the economy of a country.
- (b) Explain the fundamental principles of surveying. List the modern tools used for surveying and mapping. Explain any **ONE** in detail.
- (c) Explain the loads which are to be taken into account while designing the foundations of a structure.

Q.2

- (a) Explain with a neat sketch the hydrological cycle. List the various sources of water. Briefly explain the term "Watershed development" **07**
- (b) Explain the various aids and devices used to control, regulate and guide traffic. Also give the advantages and disadvantages of traffic signals. **07**

OR

- (b) What is meant by traverse surveying? How does it differ from chain surveying? Distinguish between a closed traverse and an open traverse. **07**

Q.3

- (a) Describe, with a neat sketch, the optical square and explain its principle. How is it used in field? How is it tested and adjusted? **14**
- (b) Draw a neat sectional elevation of a prismatic compass and name the parts of the instrument thereon. Also describe the use of prismatic compass.
- (c) A line was measured with a steel tape which was exactly 30 m at 18 °C and a pull of 50 N and the measured length was 459.2m. Temperature during measurement was 28 °C and the pull applied was 100 N. The tape was uniformly supported during the measurement. Find the true length of the line if the cross sectional area of the tape was 0.02 cm², the coefficient of expansion per °C = 0.0000117 and modulus of elasticity = 21 x 10⁶ N/cm².

OR

Q.3

- (a) What is meant by local attraction? How is it detected? How is the observed bearing corrected for local attraction? **14**

- (b) The bearing of the sides of a traverse ABCDE are as follows:

Side	Fore bearing	Back bearing
AB	107 ⁰	287 ⁰
BC	22 ⁰	202 ⁰
CD	281 ⁰ 30'	101 ⁰ 30'
DE	189 ⁰	9 ⁰
EA	124 ⁰ 30'	304 ⁰ 30'

Compute the interior angles of the traverse.

- (c) What is meant by closing error in a closed traverse? How would you adjust it graphically?

Q.4

14

- (a) The following consecutive readings were taken with a level and a 4m leveling staff on a continuously sloping ground at a common interval of 30 m on line AB.

Chainage (m)	0	30	60	90	120	150
Level staff reading (m)	0.585	0.930	1.95	2.845	3.645	3.930
Station	A					B

The reduced level (RL) of station A is 50.00. Calculate the reduced levels at all the points where the leveling staff is placed. Tabulate the results and apply usual checks. Also determine the gradient of line AB.

- (b) Describe with sketches, the characteristics of contours and also explain the uses of contour maps.
- (c) Name five construction works where you would use stonework? State also what stones would you recommend for these works?

OR

Q.4

14

- (a) What are OPC, PPC and PSC? What types of cements are commonly available in India and used for reinforced concrete construction?
- (b) Explain the necessity of conservation and development of water resources in a region.
- (c) What are the various systems of classifying roads? Briefly outline the classification based on location and function as suggested in the Nagpur Road Plan.

Q.5

14

- (a) Enumerate the important ingredients used in modern concrete. Give a brief account of the different types of steel bars used in reinforced concrete construction.
- (b) Draw a detailed PLAN of a room of size 4 m x 3 m. Take plinth height = 60 cm. Also prepare the schedule giving relevant description of door, window, and ventilator and cupboard.
- (c) Explain how the traffic flow characteristics studies are useful.

OR

Q.5

14

- (a) Draw a detailed sketch of a cross section of a wall showing the components of the building.
- (b) Explain the different types of paints used in building construction.
- (c) List the hydraulic structures constructed for storage and conveyance of water and explain any ONE in detail.
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