

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER- 1st / 2nd EXAMINATION (New Syllabus) – WINTER 2013

Subject Code: 2110004

Date: 30/12/2013

Subject Name: Elements of Civil Engineering

Time: 10:30 am – 01:00 pm

Total Marks: 70

Instructions:

1. Question No. 1 is compulsory. Attempt any four out of remaining Six questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) Objective Question 07

1. Which of the following scale is the largest one?
(A) 1 cm = 50 m (B) 1:42000 (C) RF = 1/300000 (D) 1 cm = 50 km
2. Which of the following instrument can be used for setting out 45° on chain line?
(A) Cross-staff (B) French cross-staff (C) Prism square (D) Optical square
3. Invar tape is made of an alloy of
(A) copper and steel (B) brass and nickel (C) brass and steel (D) steel and nickel
4. The true bearing of a line is 124°. What is magnetic bearing, if declination is 2°30'E?
(A) 126°30' (B) 120°30' (C) 121°30' (D) 122°30'
5. The area of irregular boundary can be obtained by
(A) Parallax bar (B) Pentagraph (C) Prism square (D) Planimeter
6. Which one of the following is not a hydraulic structure?
(A) Dam (B) Weir (C) Soak pit (D) Canal
7. Formula of Quick lime is
(A) CaCO₃ (B) Ca(OH)₂ (C) CO₃CO₂ (D) CaO

(b) 07

1. Property of fresh concrete is
(A) Workability (B) Segregation (C) Bleeding (D) All of these
2. A 1st Class brick immersed in water for 24 hours, should not absorb water (by weight) more than
(A) 10% (B) 20% (C) 15% (D) 25%
3. Which is the part of substructure out of the following?
(A) Plinth (B) Foundation (C) DPC (D) Walls
4. Which one of the following is a Regulatory sign of traffic?
(A) Right hand curve (B) No parking sign (C) Parking sign (D) Destination sign
5. The imaginary lines joining places of equal dip are called
(A) Agonic line (B) Isogonic line (C) Isoclinic line (D) Contour
6. In metric chain, number of links per meter can be
(A) 2 (B) 5 (C) 4 (D) 8
7. Survey in which curvature of the earth surface is taken into account is
(A) Plane survey (B) Geological survey (C) Geodetic survey (D) Hydrographic survey

Q.2 (a) Explain role of civil engineer in infrastructure development. 07

- (b) State and explain fundamental principles of survey. What are aims and applications of surveying? 07**

- Q.3** (a) Write a short note on reciprocal ranging. Also solve an example of a 20 m chain was tested and found 5 cm too short before the start of work. After measuring a distance of 1200 m, it was found 8 cm too long. After measuring 850 m, the chain was found 12 cm too long during testing at the end of the day's work. Find the true distance measured during the day. **07**
- (b) Describe applications of remote sensing and contour maps. Explain the following terms related to compass survey. **07**
 (1) Magnetic meridian (2) Closing error (3) Magnetic declination

- Q.4** (a) The following fore and back bearings are observed while running a closed traverse ABCDEA. Find out which stations are affected by local attraction and calculate correct bearing and included angles. Also apply necessary checks. **07**

| Side | Fore bearing | Back bearing |
|------|--------------|--------------|
| AB | 68° | 248° |
| BC | 138° | 319° |
| CD | 193° | 13°30' |
| DE | 302°30' | 123°30' |
| EA | 17° | 194°30' |

- (b) Enumerate various basic building components. Also draw a line diagram of 2BHK residential building including a living room, a kitchen, a store room, a dining room, a bed room and a verandah. Assume data and clearly specify each room size and prepare schedule of opening. **07**
- Q.5** (a) The following consecutive readings were taken with a dumpy level and 4 m leveling staff on continuous sloping ground at 30 m intervals. 0.680, 1.455, 1.855, 2.330, 2.885, 3.380, 1.055, 1.860, 2.265, 3.540, 0.835, 0.945, 1.530 and 2.250. The R.L. of starting point was 80.750 m. Rule out page of a level book and enter the above readings. Find R.L. of other points by Rise and Fall method and apply necessary checks. Also determine gradient of a line joining first and last point. **07**
- (b) Enlist various chemical compounds of cement and explain physical properties of cement. Also give requirements of good timber as a building material. **07**
- Q.6** (a) Enumerate various principles of planning. Explain aspect, privacy and roominess in detail. **07**
- (b) Explain 'The earth water circulatory system' with neat sketch. How conservation of water is carried out? **07**
- Q.7** (a) Write functions of Foundation, Plinth and Wall as building components. Describe various types of loads acting on building. **07**
- (b) Give advantages and disadvantages of waterway transportation over other modes of transportation. Also list out various traffic control devices and explain any one of them briefly. **07**
