Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER 1st / 2nd EXAMINATION (NEW SYLLABUS) – SUMMER - 2017

Subject Code: 2110004 Date:05/06/2017

Subject Name: Elements of Civil Engineering

Time: 2:30 PM to 05:00 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 Objective Question (MCQ) **Mark**

(a) **07**

1. Which of the following scale is the largest one?
(a) 1 cm = 5 m (b) 1 cm = 50 m (c) 1:10,000 (d) 1 cm = 5 km.

2. Which of the following instrument is inserted into ground after every chain length?
(a) Peg (b) Arrow (c) Ranging rod (d) Offset rod.

3. The value of dip at magnetic pole is____
(a) 0° (b) 45° (c) 90° (d) 30°

4. Concrete preferably used in manufacturing of railway sleepers, bridge girders, electric poles etc. is_____
(a) P.C.C. (b) R.C.C. (c) P.S.C. (d) P.C.

5. "Give way" sign is a type of _____
(a) Regulatory sign (b) Warning sign (c) Informatory sign (d) None

6. Width of foundation for 30 cm thick wall is _____
(a) 70 cm (b) 90 cm (c) 120 cm (d) None

7. A basin of navigable water well protected naturally or artificially from action of wind and wave is_____
(a) Reservoir (b) Harbour (c) Dock (d) All the above

(b) **07**

1. A framework of numbers of connected survey lines is called_____
(a) Bearing (b) Traverse (c) Contour (d) Declination.

2. Error in reciprocal leveling is not completely eliminated due to_____
(a) Curvature (b) Refraction (c) Non-adjustment of line of collimation (d) Parallax.

3. Initial setting time of cement is delay due to presence of _____
(a) $CaCO_3$ (b) CaO (c) $CaSO_4$ (d) Al_2O_3

4. Geometric element provided to road surface in transverse direction to drain off rain water from road surface is _____
(a) Shoulder (b) Super elevation (c) Camber (d) All the above.

5. A survey conducted to determine latitudes, longitudes, azimuths etc. for various places on the earth by observing heavenly body is _____
(a) Archeological survey (b) Aerial survey (c) Astronomical survey (d) Geological survey.

6. A 100 ft long chain is a _____
(a) Gunter's chain (b) Revenue chain (c) Engineer's chain (d) Metric chain

7. A hydraulic structure constructed across river to control flood is _____
(a) Check dam (b) Gravity dam (c) Coffer dam (d) All the above

Q.2 **(a)** Enumerate objectives of watershed development. **03**

(b) Mention the qualities of a good timber. **04**

(c) Why water conservation is necessary? Explain various methods of water conservation. **07**

Q.3 **(a)** Explain various types of residential buildings. **03**

(b) Explain primary divisions of surveying. **04**

(c) Explain BOT projects for highways. **07**

Q.4 **(a)** Draw neat sketch of a stair, showing all its components. **03**

(b) Explain various important operations in concreting. **04**

(c) Enlist various types of foundation. Also write brief note on shallow foundation with neat sketches. **07**

Q.5 **(a)** Give function of following parts of compass. **03**
(i)Break pin (ii) Focusing stud and (iii) Agate cap.

(b) Explain duties of civil engineer related to fields of civil engineering. **04**

(c) Following are the bearings taken in a closed traverse. Compute interior angles and correct them for observational errors. **07**

Line	F.B.	B.B.
AB	142°30′	322°30′
BC	223°15′	44°15′
CD	287°00′	107°45′
DE	12°45′	193°15′
EA	60°00′	239°00′

Q.6 **(a)** Explain how direct ranging can be done by a line ranger. **03**

(b) Enumerate various methods of leveling and describe differential leveling. **04**

(c) The following observations were taken with dumpy level. The instrument was shifted after the second, sixth and eighth readings. The first reading was taken on a bench mark whose RL is 124.18 m. Prepare a page of level book and calculates RLs of all points by rise & fall method. The observations were taken at 30 m interval. Also find gradient between first and last point. The observations are: 3.125, 1.800, 2.265, 2.320, 1.920, 2.655, 1.040, 3.205, 1.620, 3.625 and 1.480. Apply necessary checks. **07**

Q.7 **(a)** A rectangular plot of area 75750 m^2 is represented by 3.5 cm× 5.5 cm on map. Find out the scale of map and mention its R.F. **03**

(b) List out various instruments used for setting out right angle. Also briefly explain prism square with sketch. **04**

(c) Give requirements of an industrial building. Also draw layout plan of a typical industrial building. **07**

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