

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-1/2 (NEW) EXAMINATION – WINTER 2017

Subject Code: 2110004

Date: 06/01/2018

Subject Name: Elements of Civil Engineering

Time: 10:30 AM TO 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	Objective Question (MCQ)	Mark
(a)		07
1.	The survey carried out to delineate natural features such as hills, rivers, forest etc. is classified as (A) Land survey (B) Topographic survey (C) Cadastral survey (D) Hydrographic Survey	
2.	“U-Turn Prohibited” sign is a type of (A) Informatory sign (B) Warning sign (C) Regulatory sign (D) None of the above	
3.	Which of the following statement is correct (A) Alumina imparts red color to the brick (B) C_2S is responsible for early strength of cement (C) Seasoning of timber decreases workability (D) Woods with distinct annular rings are conifers	
4.	A 30 metre chain is found to be 10 cm too short throughout a measurement. If the distance measured is recorded as 300m, what is the actual distance? (A) 299.0 m (B) 301.0 m (C) 300.1 m (D) 299.5 m	
5.	A scale of 1 inch = 100 ft. is mentioned on an old map. What is the corresponding equivalent scale? (A) 1 cm = 6 m (B) 1 cm = 10 m (C) 1cm = 12 m (D) 1 cm = 8 m	
6.	What is the angle between two plane mirrors of an optical square? (A) 30° (B) 90° (C) 60° (D) 45°	
7.	A check dam is a (A) River training structure (B) Water storage structure (C) Flood control structure (D) Soil conservation structure	
(b)		07
1.	If the declination is $5^\circ 40' W$ and the magnetic bearing of a line is $S25^\circ 20' E$, then the true bearing of the line is (A) $S31^\circ 0' E$ (B) $S19^\circ 40' E$ (C) $S19^\circ 20' E$ (D) $S19^\circ 40' W$	
2.	Which of the following statement is incorrect? (A) Closed contour lines with higher values inside represent depression (B) Closely spaced contours indicate steep slope (C) Change point is a point denoting shifting of level (D) Offsets are perpendicular erected from chain lines	
3.	The load which does not change over time is called (A) Wind load (B) Dead load (C) Snow load (D) Earthquake load	
4.	Radial splits in timber originating from ‘pith’ and narrowing towards bark are known as	

- (A)Star shakes (B) Cup shakes (C)Heart shakes (D)Wet rot
5. The minimum number of satellites needed for a GPS to determine its position precisely is
(A)2 (B)3 (C)4 (D)24
6. The reading of a 4m staff at a point is observed as 2.745m. If the staff was 8cm out of the plumb line, the correct reading should have been
(A)2.750 m (B)2.7462 m (C)2.800 m (D) 2.7438 m
7. If the slope of ground is 3° , the gradient can be represented as
(A)1:10 (B) 1:19 (C) 1:15 (D)1:12
- Q.2** (a) How mortar is different from concrete? Enlist the qualities of good brick. **03**
(b) What do you mean by building bye-laws? Explain built up area in detail. **04**
(c) A survey line PQ is run on a terrain having distance 240 m along a downward slope 1 in 12 from P to A, a distance of 225 m from A to B having an angle of elevation $5^\circ 30'$, a rise of 20m from B to Q at a distance of 250m. Find the horizontal distance between P and Q if the distances were measured with a 20m tape which was 5cm too long. **07**
- Q.3** (a) Define the following terms **03**
(i)Magnetic Declination (ii)Magnetic Meridian (iii)Reduced Level
(b) Define Surveying. What are the principles of surveying? Explain in detail. **04**
(c) In a region, magnetic bearing of line was obtained as $S56^\circ E$ in 1965.It was required to obtain the magnetic bearing of the same line in 2017.For this purpose isogonic chart of 1998 were used which shows a declination of $9^\circ E$ for the region, with an annual change of $1'$ westward. Determine the true bearing of the line and magnetic bearing of line in 2017. **07**
- Q.4** (a) Enlist brief overview of road infrastructure in India and discuss its implication in National Development. **03**
(b) Draw neat sketch of Hydrological cycle. Enlist the various techniques of water conservation. **04**
(c) The following consecutive readings were taken with a level and a 4 m staff on a continuously sloping ground at a common interval of 30 m 0.780; 1.535; 1.955; 2.430; 2.985; 3.480; 1.155; 1.960; 2.365; 3.640; 0.935; 1.045; 1.630 and 2.545. **07**
The reduced level of the first point A was 218.750 m. Rule out a page of a level book and enters the above readings. Calculate the reduced levels of the points by rise and fall method. Show necessary checks. All readings are in metre.
- Q.5** (a) Explain the role of Civil Engineer in infrastructure development **03**
(b) Describe the characteristics of contours with neat sketches. **04**
(c) Prepare plan for a room with verandah in scale 1:50. The size of room is 3.0 m x 4.0 m. Verandah is 1.5 m wide. The thickness of wall is 30 cm for external and 20 cm for internal. Provide door, window and steps at suitable location. Write assumed dimensions for them **07**
- Q.6** (a) Describe how you would range a survey line between two stations which are not inter visible? **03**

- (b) Enlist the various principles of Planning. Is it feasible to follow all the principals in a single project? Justify your answer with suitable case. **04**
- (c) The plan of a survey plotted to a scale of 1 cm to 10m is reduced in such a way that line originally 10 cm long now measures 9.5 cm. The area of the reduced plan is measured as 92 cm². Find the actual area (m²) of the survey. **07**
- Q.7** (a) Define Fibre Saturation Point? Enlist the various objectives of Seasoning of timber. **03**
- (b) Explain the types of building based on the types of construction. **04**
- (c) Differentiate between the following **07**
- (i) Weir and Barrage
 - (ii) Load bearing and Framed structures
 - (iii) Regulatory signs and Informatory signs
