Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–III(New) • EXAMINATION – WINTER 2016

Subject Code:2130601 Date:02/01/2017

Subject Name:Surveying

Time:10:30 AM to 01:00 PM Total Marks: 70

Instructions:

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

		MARKS
Q.1	**Short Questions**	**14**

1 Inaccessible points may be located by the
(a) Radiation (b) Intersection
(c) Traversing (d) Resection

2 The U-fork and plumb bob are required for
(a) Centering (b) Orientation
(c) Levelling (d) Bisecting

3 The lower plate of theodolite is fixed to
(a) Inner spindle (b) Outer spindle
(c) Levelling head (d) Shifting head

4 If f_1 be the focal length of the objective and f_2 that of the eye-piece, then magnifying power is given by
(a) $f_1 \times f_2$ (b) f_1 / f_2
(c) f_2 / f_1 (d) $f_1 - f_2$

5 Approximate bisection in a theodolite is done by the
(a) Focussing screw (b) Tangent screw
(c) Clamp screw (d) Foot screw

6 Balancing of Traverse is done according to the
(a) Bowditch's rule (b) Transit rule
(c) Third rule (d) All above

7 The difference between face left and face right observations of a theodolite is 4'. The error is
(a) 4' (b) 4"
(c) 2' (d) 0'

8 Overturning of vehicles on a curve can be avoided by using a
(a) Compound curve (b) Reverse curve
(c) Vertical curve (d) Transition curve

9 The radius of a 1° curve is
(a) 1719 m (b) 1917 m
(c) 1918 m (d) 1819 m

10 Combined correction for curvature and refraction in linear measurement is given by
(a) $0.0785\ D^2$ (b) $0.0112\ D^2$
(c) $0.06735\ D^2$ (d) None of above

11 The area of zero circle is equal to
(a) C (b) M
(c) M x C (d) M / C

12 For determination of the area of a figure bounded by straight lines, the figure is generally converted in to a network of
(a) squares (b) rectangles
(c) triangles (d) polygons

13 Where the depth of water is too much, machine used is known as
(a) fathometer (b) lead line
(c) sounding poles (d) sextant

14 The accessory used in setting out works is
(a) boning rod (b) traveller
(c) batter board (d) all of the above

Q.2 **(a)** Explain three instruments of plane table survey with sketch **03**

(b) What is orientation? Discuss the different methods of orientation of a plane table. **04**

(c) What is closing error in a closed traverse? How will you find out its magnitude and direction? **07**

OR

(c) List the Fundamental lines of a theodolite and explain briefly the desired relationship between these lines. **07**

Q.3 **(a)** Define the following: **03**
(a) Shore signals (b) Range (c) Lead Line

(b) Differentiate between trapezoidal rule and Simpson's rule. **04**

(c) Discuss the steps involved in setting out the positions of piers of a bridge. **07**

OR

Q.3 **(a)** Give Classification of theodolites **03**

(b) Compare/distinguish between trigonometric levelling and direct levelling. **04**

(c) Explain the procedure of setting out of building foundation. **07**

Q.4 **(a)** What is meant by balancing a traverse? State the various rules used to do this. **03**

(b) Derive formula for height h and distance D in trigonometric leveling when two instruments are set at different level. **04**

(c) Explain the procedure for setting out simple circular curve with a tape and a theodolite (Rankine's method) **07**

OR

Q.4 **(a)** Define transition curve, compound curve and reverse curve. **03**

(b) Define Sounding and purpose for which soundings are required **04**

(c) A single-level section has a formation width of 7.5 m. and side slopes 2:1. The depth of cutting at the centre at every 30 m. intervals is 1.8, 2.175, 2.55, 2.925, and 3 m. Find the volume of earthwork in the length of 120 by Trapezoidal formula and Prismoidal formula. **07**

Q.5 **(a)** List the various methods of calculating the area of a closed traverse? Explain any one. **03**

(b) Define Hydrographic surveying. What are the various operations conducted in hydrographic surveying? **04**

(c) Two tangents intersect at a chainage of 1400m the deflection angle being 24°. Calculate the following quantities for setting out a curve of radius 275m. **07**
(1) Tangent Length (2) Length of Long Chord (3) Length of Curve (4) Chainage of point of commencement and tangency (5) Apex distance.

OR

Q.5 **(a)** Describe types of vertical curves with sketches **03**

(b) What are the elements of simple circular curve? Explain with neat sketch. **04**

(c) The latitude and departures of the lines of a closed traverse are given below. Calculate the area of traverse by Co-ordinates method and Meridian distance method. **07**

Line	Northing	Southing	Easting	Westing
AB	-	157.20	154.80	-
BC	210.50	-	52.50	-
CD	175.40	-	-	98.30
DA	-	228.70	-	109.0

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