Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–III(New) EXAMINATION – SUMMER 2016

Subject Code:2130601   **Date:02/06/2016**
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 In plane table survey, the inaccessible points may be located by
  a   Resection   b   Radiation
  c   Intersection   d   Traversing

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

3 Turning the telescope in the vertical plane about its horizontal axis is called
  a   Plunging   b   Swinging
  c   Transiting   d   Both a and c

4 If n be the number of lines of a traverse, then the sum of measured interior angles should be equal to
  a $(2n + 4) \times 90°$ b $(2n \times 4) + 90°$
  c $(2n - 4) + 90°$ d $(2n - 4) \times 90°$

5 Trigonometric levelling is the ……. Method of levelling.
  a   Indirect   b   Direct
  c   Relative   d   Reciprocal

6 When the base of the object is accessible, the horizontal distance between the instrument and the object is D, the elevation H is given by
  a $D \sin\alpha$ b $D \tan\alpha$
  c $D \cos\alpha$ d $D \cot\alpha$

7 The radius of 1 degree curve is
  a   1819m   b   1718m
  c   1719m   d   1918m

8 Shift of the curve is given by
  a $L^2 / 6 R$ b $L / 24 R^2$
  c $L^2 /24 R$ d $L^2 / 36 R$

9 In the trapezoidal formula, the line joining to the top ordinates is assumed to be
  a   Parabolic   b   Straignt
  c   Curved   d   Circular

10 In simpson's rule, the number of ordinates must be
  a   Either odd or even   b   Odd
  c   Even   d   In multiple of 3

11 The angles from sounding boat are measured with a

    a   Nautical sextant   b   Compass

    c   Box sextant   d   Theodolite

12 The observations to establish MSL are recorded for about

    a   9 years   b   19 years

    c   29 years   d   39 years

13 Tunnel surveying consists of

    a   Surface survey   b   Underground survey

    c   Both a and b   d   None of the above

14 Bridges cannot be set out from the centre because

    a   The water body involved is generally a perennial one   b   Alignment of bridge is inclined

    c   They generally consist of more than one span   d   Both a and c

Q.2	**(a)**	Explain radiation method of plane table survey.	**03**
	(b)	Explain Two point problem of resection in plane table survey	**04**
	(c)	Enlist methods of theodolite traversing and explain any one of them in detail.	**07**

OR

	(c)	In a closed traverse the latitudes and departures of the sides were calculated and it was observed that ∑L=1.42 and ∑D=-2.14. Calculate the length and bearing of the closing error.	**07**
Q.3	**(a)**	Derive relation between radius and degree of a curve. Use arc definition.	**03**
	(b)	Compare/distinguish between trigonometric levelling and direct levelling.	**04**
	(c)	Derive the expressions for computing horizontal distance and elevation in trigonometric leveling while base of the object is inaccessible and instrument stations are in the same vertical plane with the elevated object for the instrument axis at same level.	**07**

OR

Q.3	**(a)**	Define hydrographic surveying, sounding and datum.	**03**
	(b)	Explain shoreline survey.	**04**
	(c)	A theodolite was setup at P and the angle of elevation of the top of an electric pole QR was 25˚30'. The horizontal distance between P and Q, the foot of the pole was 500m. determine the RL of the top of the pole if the staff reading held on a BM or RL 100m was 3.535m with the telescope in horizontal plane.	**07**
Q.4	**(a)**	Draw a neat sketch of simple circular curve with all notations and define point of intersection.	**03**
	(b)	Explain designation of curve.	**04**
	(c)	Explain offsets from the long chord method of setting out circular curve with neat sketch.	**07**

OR

Q.4	**(a)**	Define transition curve, compound curve and reverse curve.	**03**
	(b)	Explain why super elevation is required in roads and railways. Derive an expression for super elevation.	**04**
	(c)	Two straight lines intersect at chainage of 1150.50 m and the angle of deflection is 60˚. If the radius of the curve is 450m, determine (1) tangent distance (2) length of curve (3) chainages of points of curvature and tangency (4) length of long chord (5) Degree of curve (6) Apex distance and (7) Mid-ordinate.	**07**
Q.5	**(a)**	Derive the expression to compute area from offsets to a base line by trapezoidal rule.	**03**
	(b)	Discuss how reservoir capacity is determined?	**04**
	(c)	The ground level along the centre line of a road is given below. It is proposed that the formation level of RL 215.0 should be kept constant of starting from	**07**

the chainage zero. The formation width of the road is 7 m and the side slope 1:1. The ground is level transverse to the centre line.

Ch (m)	0	50	100	150	200	250	300
GL (m)	218.0	216.5	216.0	216.75	217.3	217.95	215.65

OR

Q.5 **(a)** Explain float gauge with reference to hydrography. **03**

(b) Describe station pointer. **04**

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

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