



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech (CE-OLD)/SEM-4/CE-403/2013

2013

SURVEYING - II

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

- i) A theodolite is called a transit theodolite
 - a) when its telescope can be revolved to change face
 - b) when the telescope can swing
 - c) when the telescope can be through 90°
 - d) when the telescope is in normal position.
- ii) In a closed traverse, the algebraic sum of departure and latitude must be equal to
 - a) 90°
 - b) 180°
 - c) 0°
 - d) 270° .



- iii) Which of the following corrections are made in case of a reciprocal observations in trigonometric levelling ?
- a) Correction due to refraction
 - b) Axis signal correction
 - c) Correction due to curvature
 - d) All of these.
- iv) Angular surveying in which both horizontal and vertical positions of a point are obtained by optical means is known as
- a) Tacheometry
 - b) Hydrography
 - c) Topography
 - d) All of these.
- v) Total angle of deflection of a transition curve is
- a) spiral angle
 - b) spiral angle/2
 - c) spiral angle/3
 - d) spiral angle/4.
- vi) Setting out a simple curve by two theodolite method does not require
- a) angular measurements
 - b) linear measurements
 - c) both angular and linear measurements
 - d) none of these.
- vii) Overturning of vehicles on a curve can be avoided by using
- a) compound curve
 - b) vertical curve
 - c) reverse curve
 - d) transition curve.



- viii) The horizontal distance obtained tacheometrically is corrected for
- a) slope correction
 - b) temperature correction
 - c) refraction correction & curvature correction
 - d) tension correction.
- ix) A simple curve is designed by
- a) degree of curve
 - b) radius of curve
 - c) both (a) & (b) are correct
 - d) both (a) & (b) are wrong.
- x) A transition curve introduced gradually with the
- a) direction
 - b) super-elevation
 - c) gradient
 - d) camber.
- xi) The method of tacheometry in which the interval on levelling staff is variable and station hair intercept is fixed is known as
- a) movable hair method
 - b) fixed hair method
 - c) tangential hair method
 - d) sub-tense hair method.
- xii) If i is the stadia distance, f is the focal length of the objective and d is the distance from the objective to the vertical axis of the instrument, then the multiplying tacheometric correction will be
- a) $i \times d/f$
 - b) $f/i \times d$
 - c) $f \times i/d$
 - d) f/i .



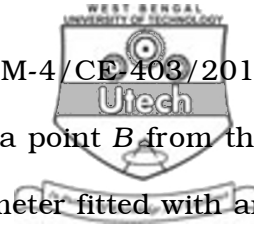
GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following.

3 × 5 = 15

2. Write the methods involving location soundings. What is reduction of sounding ?
3. Write down method of setting out of simple circular curve by two theodolite and tacheometric method.
4. Write stages of Remote Sensing System. What is station pointer ?
5. An instrument was set up at P and the angle of elevation to a vane 4 m above the foot of the staff held at Q was $9^{\circ} 30'$. The horizontal distance between P and Q was known to be 2000 m. Determine the R.L. of the staff Q . Given that the R.L. of the instrument axis was 2650.80 m.
6. What is tacheometry ? Where is it applied ? What are the methods of tacheometry ? Write only the expressions of the following tacheometric survey :
 - i) Distance and elevation formula for staff vertical inclined sight
 - ii) Distance and elevation formula for staff normal.



7. Determine the gradient from a point A to a point B from the following observations made with a tachometer fitted with an anallatic lens. The constant of the instrument was 100 and the staff was held vertically.

Instrument Station	Staff point	Bearing	Vertical angle	Staff reading
<i>P</i>	<i>A</i>	134°	+ 10° 32'	1.36, 1.915, 2.470
	<i>B</i>	224°	+5° 6'	1.065, 1.885, 2.705

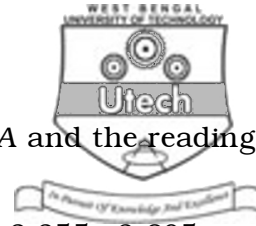
GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

8. a) The following are the lengths and bearings of the sides of a closed traverse *ABCDE*, the length and bearing of *EA* having been omitted. Calculate the length and bearing of the line *EA*.

Line	Length (m)	bearing
<i>AB</i>	204.0	87° 30'
<i>BC</i>	226.0	20° 20'
<i>CD</i>	187.0	280° 0'
<i>DE</i>	192.0	210° 3'
<i>EA</i>	?	?



- b) A tachometer was set up at a station A and the readings on a vertically held staff at B were 2.255, 2.605 and 2.955. The line of sight being at an inclination of $+8^{\circ} 24'$, another observation of the line of sight being $+1^{\circ} 6'$. Calculate the horizontal distance A and B , the elevation of B , if the RL of BM is 418.685 metres. The constants of the instrument are 100 and 3.
9. Two tangents intersect at chainage 1190 m the deflection angle being 36° . Calculate all the data necessary for setting out a curve with a radius of 300 m by
- deflection angles and
 - offsets from chords, the peg interval being 30 m.
10. Write in detail about range line & one angle from shore & boat. Write applications of remote sensing.



11. An instrument is set up beside P and the angle of depression to the vane 2 m above the foot of the staff held at Q was $5^{\circ}36'$. The horizontal distance between P & Q was known to be 3000 m. Determine the R.L. of the station Q . Given, that staff reading on a BM of elevation was 2.865 m.
12. a) What is a transit theodolite ? What are the functions of theodolite ?
- b) What are the different methods of curve settings ? What is transition curve ? Where is such a curve provided ?
13. Briefly write about clothoid and cubic spiral type of transition curve.

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