

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) II – Semester (Main) Examination, June 2014

Subject : Surveying – II**Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

- 1 What is shifting of head? 3
- 2 How do you eliminate the eccentricity between inner axis and outer axis of a theodolite? 2
- 3 What is the check adopted when exterior angles of a closed traverse having six sides are observed? 2
- 4 What is the order of various corrections applied to observed vertical angles? 3
- 5 What is the radius of a 3° curve from 20m chord definition? 2
- 6 Determine the chainages of point of curve and point of tangency for a radius of curve of 200m with external deflection angle of 45° given the chainage of point of intersection is 1000m. 3
- 7 What is the general expression for cubic spiral? 2
- 8 Why do you prefer a parabola as vertical curve? 3
- 9 The focal length of objective of a tacheometer is 25 cm and the distance of vertical axis is 12cm and find out the distance at which the anallactic lens having a focal length of 10 cm should be kept from the objective. 3
- 10 Explain briefly about shore line survey. 2

PART – B (50 Marks)

- 11 a) What are the various errors eliminated by using repetition method? 4
b) Explain direct method without transmitting theodolite traversing. 6
- 12 a) Derive an expression for axis signal correction. 5
b) Compute the total coordinates for the following observations of a traverse. Given the total coordinates of A are (1500, 1120). 5

Line	Length (m)	Bearing
AB	45	45°
BC	35	120°
CD	55	235°
DA	24.18	315.28°

- 13 a) How do you set a simple curve by using successive bisection of arcs? 4
b) Two straights meet at a chainage of 825m with an external deflection angle of 85° . It is proposed to set a simple curve passing through a point P which is at distance 25m from point of intersection of V. The line VP makes an angle of 25° with rear tangent VT_1 . Determine the radius of proposed curve? 6

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- 14 a) The following observations are recorded with a subtense bar to find the distance between instrument station and subtense bar, having a length of 3m and the horizontal angle subtended at the instrument station is $35^{\circ} 40'$. 6
b) What are reduction diagrams? Explain. 4
- 15 The clothoid spirals for a road transition between two straights meet at a common tangent point. If the deflection angle between the straights is 28° , the chainage of point of intersection is 1500m and the maximum speed is 110 kmph. Calculate changes of the tangent points and compound curvature. Design the curve based on comfort condition and safety conditions, take $\alpha = 0.38 \text{ m/sec}^3$. 10
- 16 a) Two parallel railway lines are to be connected by a reverse curve, each section having the same radius. If the lines are 14 m and the maximum distance measures parallel to the straights is 52m, find the maximum allowable radius. 6
b) Explain the principle of setting simple curve by two theodolite method. 4
- 17 Write short notes any two of the following : 10
i) Fundamental lines of theodolite
ii) Prediction of tides by non-harmonic motion
iii) Location of soundings two angles from boat
