

Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name: Surveying-II

Subject Code: 4TE04SUR1

Branch: B.Tech.(Civil)

Semester: 4

Date: 11/05/2017

Time: 02:00 To 05:00

Marks: 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
- (2) Instructions written on main answer book are strictly to be obeyed.
- (3) Draw neat diagrams and figures (if necessary) at right places.
- (4) Assume suitable data if needed.

Q-1 Attempt the following questions: (14)

- a) With the rise of temperature, the sensitivity of a bubble tube will be ____ 01
- b) What is main disadvantage of tacheometric surveying? 01
- c) What are the multiplying constant and additive constant of a tacheometer? 01
- d) If the intercept on a vertical staff is observed as 0.75 m from a tacheometer, with the line of sight horizontal, fitted with anallactic lens, the horizontal distance between the tacheometer and the staff station is ____ 01
- e) What is cant deficiency? 01
- f) Enlist the obstacles in setting out simple curves. 01
- g) The long chord and tangent length of a circular curve of radius R will be equal if the angle of deflection is ____ 01
- h) What are the basic functions of an EDM instrument? 01
- i) Laser plummet in total-station is used for ____ 01
- j) What is photo principal point and ground principal point? 01
- k) Define residual error. 01
- l) The maximum allowable limit up to that a measurement may vary from the true value is known as ____ 01
- m) What is the purpose of hydrographic survey? 01
- n) What is the sensible horizon? 01

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions (14)

- (a) What is spire test? How is it carried? 05
- (b) Two tangents PQ and QR are intersecting at angle 60° . Calculate following elements of curve if radius of curve is 280 m. (i) Tangent length, (ii) Length of long chord, (iii) External distance, (iv) Mid ordinate. Hint: Deflection angle (Δ) = 180° - Angle of intersection (ϕ) 05
- (c) Differentiate between Dumpy level and Tilting level. 04

Q-3 Attempt all questions (14)

- (a) What is photogrammetric surveying? What is its basic principle? 05
- (b) Explain the theory of least squares. 05
- (c) The stadia readings with horizontal sight on a vertical staff held 50 m from a tachometer were 1.285 m and 1.780 m. The focal length of the object glass was 25 cm. The distance between the object glass and the vertical 04



axis of the tacheometer was 15 cm. Calculate the stadia interval.

Q-4 Attempt all questions (14)

- (a) Find out standard time for India for a local time of 18^h 24^m 12^s measured at observer station having longitude of 72° 18' E (Longitude of standard meridian for India = 80° 30' E) 05
- (b) To determine the average scale of an aerial photograph, three points A, B and C were selected. Their elevations were obtained from a contoured map as 1400 m, 900 m, and 1100 m. If the flying height of the aircraft above mean sea level is 3500 m and the focal length of the camera lens is 160 mm, calculate the average scale of the aerial photograph. 05
- (c) The maximum allowable speed on a curve is 80 km/hr and the rate of change of radial acceleration is 0.4 m/sec²/sec. Calculate the length of the transition curve if the radius of the circular curve is 200 m. 04

Q-5 Attempt all questions (14)

- (a) Explain the term 'Tacheometry'. What are the applications of tacheometric survey? Mention the instruments used in tacheometric survey. 07
- (b) The elevation of a point P is to be determined by observations from two adjacent stations of a tacheometric survey. The staff was held vertically upon the point, and the instrument is fitted within an anallactic lens, the constant of the instrument being 100. Compute the elevation of the point P from the following data, taking both the observations as equally trustworthy: 07

Inst. station	Height of axis	Staff point	Vertical angle	Staff readings	Elevation of station
A	1.42	P	+ 2° 24'	1.230, 2.055, 2.880	77.750 m
B	1.40	P	- 3° 36'	0.785, 1.800, 2.815	97.135 m

Also, calculate the distance of A and B from P.

Q-6 Attempt all questions (14)

- (a) List the methods for setting out simple circular curve and describe any one 07
- (b) Define GIS. Enlist key components of GIS. Explain applications of GIS in civil engineering. 07

Q-7 Attempt all questions (14)

- (a) Discuss Flight planning for aerial photogrammetry. 07
- (b) Find the most probable values of the angles A, B and C of the triangle ABC from the following observation equations, 07

$$A = 62^{\circ} 23' 34''$$

$$B = 54^{\circ} 12' 23''$$

$$C = 63^{\circ} 24' 06''$$

Q-8 Attempt all questions (14)

- (a) What is sounding? List various methods of locating soundings in hydrographic surveying and explain location of soundings from boat in detail. 07
- (b) Convert following angles in (h, m, s) 07
- (a) 73° 41' 13"
- (b) 15° 53' 18"
- (c) 108° 59' 59"

