Enrollment No: _____   **Exam Seat No:** _____

C.U.SHAH UNIVERSITY
Summer Examination-2016

Subject Name : Surveying-II

Subject Code : 4TE04SUR1   **Branch :** B.Tech (Civil)

Semester : 4   **Date :** 16/05/2016   **Time :** 02:30 To 05:30   **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)	What is the difference between a theodolite and tacheometer?	01
b)	State principle of tacheometry.	01
c)	What is a subtense bar?	01
d)	What is a transition curve?	01
e)	What is relief displacement?	01
f)	Define nadir point used in aerial photogrammetry.	01
g)	What is sounding?	01
h)	What is the best method for locating sounding, to estimate the dredged material from harbor?	01
i)	What is lunar tide?	01
j)	What is azimuth?	01
k)	What is anallatic lens?	01
l)	What are the multiplying constant and additive constant of a tacheometer?	01
m)	Define most probable error.	01
n)	Define weight of an observation.	01

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

Q-2	**Attempt all questions**	**(14)**
(a)	Describe the permanent adjustments required for the tilting level.	05
(b)	Explain how the stadia constant K and C are determined by the laboratory measurement method.	05
(c)	Differentiate between: Summit curve and valley curve.	04
Q-3	**Attempt all questions**	**(14)**
(a)	Define degree of curve. Derive relation between the degree of curve and its radius.	05
(b)	Compute the values of following components of simple circular curve. (i) Length of curve, (ii) Tangent length, (iii) Length of long chord, (iv) Apex distance, and (v) Mid-ordinate. Take radius of curve = 200m and deflection angle = 65°.	05
(c)	An image of the top of the hill is 96 mm from the principal point of the	04

photograph. The elevation of the top of the hill is 500 m and the flying height is 4000 m above datum. Calculate the relief displacement.

Q-4 **Attempt all questions** **(14)**
(a) Explain different instruments used in measurement of sounding. 05
(b) What is hydrography? What are its objectives? 05
(c) Explain the following astronomical terms: 04
(i) Spherical triangle, (ii) Horizon, (iii) Celestial sphere, (iv) Ecliptic.

Q-5 **Attempt all questions** **(14)**
(a) What is tangential method of tacheometry? Derive the expressions for horizontal and vertical distances by the tangential method when the staff is held vertically and when one angle is that of elevation and the other angle is that of depression. 07
(b) A tacheometer 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 $+ 8^0 24'$. Another observation on the vertically held staff at B.M. gave the readings 1.640, 1.920 and 2.200, the inclination of the line of sight being $+ 1° 6'$. Calculate the horizontal distance between A and B, and the elevation of B if the R.L. of B.M. is 418.685m. The constants of the instruments were 100 and 0.3. 07

Q-6 **Attempt all questions** **(14)**
(a) A tacheometer is set up at an intermediate point on a traverse course PQ and the following observations are made on a vertically held staff: 07

Staff station	Vertical angle	Staff intercept	Axial hair readings
P	8° 36'	2.350	2.105
Q	6° 6'	2.055	1.895

The instrument is fitted with an anallactic lens and the constant is 100. Compute the length of PQ and reduced level of Q, that of P being 321.50 meters.
(b) Derive the expressions for horizontal distance and elevation formulae in the Fixed hair method (Stadia method) for horizontal sights. 07

Q-7 **Attempt all questions** **(14)**
(a) Enumerate different types of EDM instruments and describe briefly the salient features of Total station. 07
(b) Adjust the following angles of closed horizon by distribution of error rule. 07
A = 85° 32' 51"   wt. 3
B = 115° 28' 32"   wt. 2
C = 103° 16' 25"   wt. 1
D = 55° 42' 20"   wt. 4

Q-8 **Attempt all questions** **(14)**
(a) Derive an expression for an ideal transition curve. 07
(b) Convert following hours into degree, minutes and seconds. 07
(a) $8^h 49^m 13^s$
(b) $17^h 59^m 59^s$
(c) $23^h 59^m 59^s$