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

C.U.SHAH UNIVERSITY

Winter Examination-2015

Subject Name : Surveying-II

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

Semester : IV **Date :** 21/11/2015 **Time :** 2:30 To 5:30 **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 a subtense bar? 01

b) What is tacheometric surveying? 01

c) Enlist various types of curves. 01

d) What is designation of curve? 01

e) What is relief displacement? 01

f) What is azimuth? 01

g) What is sounding? 01

h) Hydrographic survey deals with the mapping of 01
(A) Large water bodies (B) rainfall data
(C) wave movement (D) none of the above

i) In the double application of principle of reversion, the apparent error is 01
(A) equal to true error (B) half the true error
(C) two times the true error (D) four times the true error

j) What is the use of a station pointer? 01
(A) For making soundings in water bodies
(B) For plotting of soundings in harbour area
(C) For marking sunken shipping hazards
(D) For making tidal observations

k) The multiplying constant for the tacheometer is 01
(A) $\frac{f}{i}$ (B) $\frac{i}{f}$ (C) $\frac{f}{d}$ (D) $f + d$

l) The additive constant for the tacheometer is 01
(A) $\frac{f}{i}$ (B) $\frac{i}{f}$ (C) $\frac{f}{d}$ (D) $f + d$

m) When R is the radius of the curve (in metres), D is the degree of curve (in degree) and length of the chord is 30 m, then the relation between R and D is 01
(A) R = 1520/D (B) R = 1720/D (C) R = 4500/D (D) R = 5400/D

(C) cross hairs only (D) all of these

n) The curve used for ideal transition curve is a 01

(A) cubic parabola (B) clothoid spiral (C) cubic spiral (D) lemniscates

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

Q-2 **Attempt all questions** **(14)**

(a) Describe the adjustment of cross-hair ring for the dumpy level. 05

(b) What is a transition curve? Why and where it is provided? 05

(c) List the various application of air photography. 04

Q-3 **Attempt all questions** **(14)**

(a) What is photogrammetric surveying? What is its basic principal? 05

(b) A line AB measures 11.00 cm on a photograph taken with a camera having a focal length of 21.5 cm. The same line measures 3 cm on a map drawn to scale of 1/45000. Calculate the flying height of the aircraft, if the average altitude is 350 m. 05

(c) What is spherical triangle? State the properties of spherical triangle. 04

Q-4 **Attempt all questions** **(14)**

(a) Derive the expression for the horizontal and vertical distances in the fixed hair method when the staff is held normal and the measured angle is that of elevation and 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 418.685 metres. The constants of the instruments-were 100 and 0.3. 07

Q-5 **Attempt all questions** **(14)**

(a) Explain how the stadia constant K and C are determined by the various methods. 07

(b) Determine the gradient from a point A to a point B from the following observations made with a tacheometer fitted with an anallactic lens. The constant of the instrument was 100 and the staff was held vertically : 07

lnst. station	Staff point	Bearing	Vertical angle	Staff readings
P	A	134^o	10^o 32'	1.360. 1.915, 2.470
	B	224^o	5^o 6'	1.065, 1.885, 2.705

Q-6 **Attempt all questions** **(14)**

(a) Define the following terms: (i) Nadir, (ii) Indirect observations, (iii) Zenith, (iv) Conditioned quantity, (v) Longitude, (vi) Residual error, (vii) Normal equation. 07

(b) What are the systems of co-ordinates to specify the position of celestial body? Explain any one in detail with sketch. 07

Q-7 **Attempt all questions** **(14)**

(a) What is the principle of EDM? Discuss electromagnetic waves and electromagnetic spectrum. 07

(b) Describe the following methods of locating soundings in hydrographic survey: 07
(i) Location by range and one angle from the shore,
(ii) Location by intersecting ranges.

Q-8 Attempt all questions (14)

(a) Two points A and B which appear in a vertical photograph taken from a camera having focal length of 220 mm and from an altitude of 2800 m, have their elevations as 400 m and 600 m, respectively. Their corrected photo coordinates are as under: 05

Point	Photo coordinates	
	x (mm)	y (mm)
a	+ 23.8	+ 16.4
b	- 13.6	- 29.7

Determine the length of the ground line AB.

(b) What are the precaution to be taken during the permanent adjustments? 05

(c) What is hydrography? What are its objectives? 04