

C.U. SHAH UNIVERSITY

Summer Examination-2019

Subject Name: Surveying-II

Subject Code: 4TE04SUR1

Branch: B.Tech (Civil)

Semester: 4

Date: 24/04/2019

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) | The stadia method in tacheometry is used to determine_____ | 1 |
| | a) Horizontal angle | b) Vertical angle |
| | c) horizontal distance | d) Horizontal and vertical distances |
| b) | The additive constant in tacheometer would be..... when taking analytic lens. | 1 |
| | a) 0 | b) 50 |
| | c) 100 | d) 75 |
| c) | The centrifugal ratio is given by_____ | 1 |
| | a) $P \times W$ | b) $P - W$ |
| | c) $\frac{W}{P}$ | d) $\frac{P}{W}$ |
| d) | The length of transition curve is given by | 1 |
| | a) $L = n \times e$ | b) $L = n/e$ |
| | c) $L = n + e$ | d) $L = e/n$ |
| e) | The sensitivity of a bubble tube can be increased by | 1 |
| | a) increasing the diameter of the tube | |
| | b) decreasing the length of bubble | |
| | c) increasing the viscosity of the liquid | |
| | d) decreasing the radius of curvature of tube | |
| f) | Total angle of deflection of a transition curve is | 1 |
| | a) spiral angle | b) spiral angle/2 |
| | c) spiral angle/3 | d) spiral angle/4 |
| g) | The satellite constellation of GPS consists of | 1 |
| | a) 4 satellite | b) 6 satellite |
| | c) 18 satellite | d) 24 satellite |
| h) | EDM in a total station measure directly | 1 |
| | a) vertical angle | b) horizontal angles |
| | c) slope distance | d) horizontal distances |
| i) | Laser plummet in total station is used for | 1 |
| | a) centering | b) leveling |
| | c) orientation | d) bisection of point sighted |
| j) | What is the unit of sounding? | 1 |
| | a) m/s | b) m ² /s |
| | c) ampere | d) Fathom |
| k) | The usual longitudinal overlap in aerial photogrammetry to control | 1 |
| | a) 25% | b) 30% |
| | c) 50% | d) 60% |
| l) | In a tilted photograph, the relief displacement is radial from the | 1 |
| | a) principal point | b) isocenter |
| | c) nadir point | d) homologous points |



- m) The branch of surveying which deals with water bodies is known as _____ 1
 a) aqueous surveying b) topographic surveying
 c) hydrographic surveying d) sea surveying
- n) In India, the standard meridian is at the following longitudinal from Greenwich: 1
 a) $5^{\text{h}}30^{\text{m}}\text{E}$ b) $5^{\text{h}}30^{\text{m}}\text{W}$ c) $7^{\text{h}}30^{\text{m}}\text{E}$ d) $7^{\text{h}}30^{\text{m}}\text{W}$

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

Q-2 Attempt all questions (14)

- a.) Following observations were taken to find out constants of Tacheometer 7

Instrument station	Staff station	distances	Staff reading	
			Lower stadia	Upper stadia
o	A	150	1.255	2.750
	B	120	1.000	3.000
	C	250	0.750	3.255

- b.) Compute the value of following components of simple circular curve. 7
 (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°

Q-3 Attempt all questions (14)

- a.) Explain the theory of stadia tacheometry. 7
 b.) What is hydrography? What are its objectives? 4
 c.) Requirement of an ideal transition curve. 3

Q-4 Attempt all questions (14)

- a.) What is relief displacement? Derive an expression for the relief displacement in a vertical photograph. 7
 b.) What is transition curve? State the various types of transition curve with the help of a neat sketch. Explain briefly its necessity. 7

Q-5 Attempt all questions (14)

- a.) Describes the permanent adjustments required for the tilting level. 7
 b.) What is the principle of E.D.M? Discuss electromagnetic waves and electromagnetic spectrum. 7

Q-6 Attempt all questions (14)

- a.) The measured photo coordinates of images a and b of ground points A and B are $x_a = +45.35\text{mm}$; $y_a = +37.41\text{mm}$, $x_b = -40.16\text{mm}$; $y_b = -45.65\text{mm}$. Determine the ground coordinates of A and B and hence compute the horizontal length of line AB. 7
 The elevation of points A and B are respectively 200m and 150m above the datum and the flying height is 1500m above the datum. Take $f = 152.4\text{mm}$.
- b.) The standard meridian for India is $82^{\circ}30'$ E. Find the local mean time the following places corresponding to the standard time of 18hr 35min00sec 7
 (a) 115°E (b) 35°W and (c) 35°E

Q-7 Attempt all questions (14)

- a.) Describe Global Positioning System (GPS) in detail. 7
 b.) An image of the top of the hill is 96 mm from the principal point of the 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. 4
 c.) What is sounding? List various methods of locating soundings in hydrographic Surveying. 3



- Q-8** **Attempt all questions** **(14)**
- a.)** Define following Astronomical terms: **7**
(1) Celestial sphere, (2) Zenith, (3) Nadir (4) Lunar tide (5) solar tide (6) Hour Circle (7) Latitude
- b.)** Define GIS. Enlist key components of GIS. Explain applications of GIS in civil engineering. **7**

