

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE**End Semester Examination – Summer 2019****Course: B. Tech in Civil Engineering****Sem: IV****Subject Name: Surveying-II****Subject Code: BTCVC402****Max Marks: 60****Date: 16/05/2019****Duration: 3 Hr.****Instructions to the Students:**

1. Solve **ANY FIVE** questions out of the following.
2. The level question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

	(Level/CO)	Mark
Q. 1 Solve Any Two of the following.		12

- A) a) In tacheometric surveying following observations were taken from station P, upon vertically held staff at Q. The tacheometer is provided with anallatic lens and multiplying constant is 100. Determine the horizontal distance between P & Q. Also determine gradient from P to Q. **CO2 06**

Instrument Station	HI	Staff Station	Vertical angle	Staff Reading	Remark
P	1.50 0	Q	0°00'	1.300, 1.600, 2.200	RL of P = 250.00 m

b) Explain basic principle of EDM instrument with neat labeled diagram.

- B) Explain Anallatic lens in detail with neat labeled diagram. **CO3 06**
- C) a) Explain the theory of Stadia Tacheometry. **CO3 06**
- b) Explain difference between Fixed and Movable Hair method of Tacheometry. **CO3**

Q.2 Solve Any Two of the following. **12**

- A) Define and Explain i) Signals ii) Satellite Station iii) Spherical triangle. **CO3 06**
- B) Define Base line, List down base measuring equipments and write down points to be considered while selecting the base line **CO3 06**
- C) Define Triangulation and Explain Classification of Triangulation System. **CO3 06**

Q. 3 Solve Any One of the following.**12**

- A) a) Define i) Vertical circle ii) The Prime Vertical iii) The Longitude iv) The Latitude v) The Declination vi) Hour Circle

CO3**12**

b) Explain method of determination of latitude by meridian altitude of Sun or Star with neat labeled diagram.

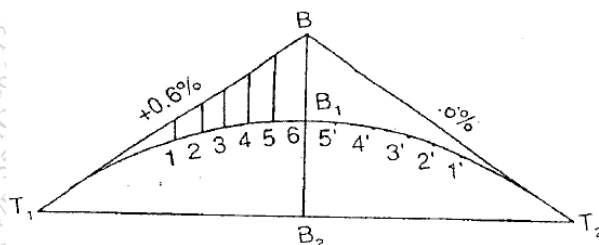
- B) The meridian altitude of the Sun's lower limb was observed to be $41^{\circ}12'26''$ at a place in longitude $72^{\circ}20'45''$ W to determine the latitude of the place. The Sun was to the south of the zenith. The declination of the sun at GAN on the day of observation was $19^{\circ}38'52''$ N, increasing $7.46''$ per hour and in semi-diameter $16'14'24''$. Determine the Latitude of the place.

CO3**12****Q.4 Solve Any Two of the following.****12**

- A) Define Combined Curve. Explain elements of Combined curve with neat labeled diagram.

CO1**06**

- B) Calculate the RL of the various pegs on a vertical curve connecting two grades of $+0.6\%$ and -0.6% . The chainage and the RL of intersection point are 550 and 325.50 m respectively. The rate of change of grade is 0.1% per 30 m.

CO2**06**

- C) What is Shift? Prove that a transition curve bisects a shift and that a shift bisects a Transition Curve.

CO2**06****Q. 5 Solve Any Two of the following.****12**

- A) a) Two points A and B having elevations of 500m and 300 m respectively above datum appear on the vertical photograph having focal length of 20cm and flying altitude of 2500m above datum. Their correlated photographic co-ordinates are as follows:

CO4**06**

Point	Photographic Co-ordinates	
	X(cm)	y(cm)
a	+2.65	+1.36
b	-1.92	+3.65

b) It is required to do photogrammetric survey over an area of 500 sq.km, scale of photograph 1 in 10000 and photograph format is 230mm X 230mm. Taking longitudinal overlap 60% and side overlap 30%. Calculate the number of photographs required. **CO4**

B) a) A line AB measures 11cm on a photograph taken with a camera having focal length of 21.5cm. The same line measures 3 cm on a map drawn to a scale of 1/45000. If the average altitude is 350 m, Calculate the flying height of the aircraft. **CO4 06**

b) A line 2350 m long lying at an elevation of 500m measure 10.50 cm on a vertical photograph. The focal length of the camera is 20cm. If the elevation of a point is 1200m. Calculate the scale of photograph. **CO4**

C) a) Write down comparison between Map and Aerial Photograph **CO4 06**
b) Define: i) Forward overlap ii) Side overlap iii) Relief Displacement

Q.6 Solve Any One of the following. 12

A) a) Write down difference between Aerial photograph and Satellite image. **CO4 12**
b) List down and explain types of Platforms in detail.

B) a) Write down applications of GPS and GIS. **CO4 12**
b) Explain key component of GIS.

***** End *****

Course: B. Tech in Civil Engineering

Sem: IV

Subject Name: Surveying-II (BTCVC402)

Max Marks: 60

Date: 28/11/2019

Duration: 3 Hr.

Instructions to the Students:

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc., wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly.

Marks

Q.1 Solve the following.

- A) i) Explain instruments used in Tacheometry. 06
- ii) Explain characteristics of Tacheometry.
- iii) Explain importance of EDM
- B) Following observations made using a tacheometry fitted with an anallatic lens, the multiplying constant being 100. 06

Inst. station	Height of Inst.	Staff station	WCB	Vertical angle	Hair readings	Remarks
O	1.550	A	30°30'	4°30'	1.155, 1.755, 2.355	RL of O =
		B	75°30'	10°15'	1.250, 2.000, 2.750	150.000

Calculate the distance AB, the RLs of A and B. Find also the gradient of the line AB.

Q.2 Solve the following.

- A) Explain measurement of horizontal distance by Subtense Bar and Procedure of observation with neat figure. 06
- B) Explain Triangulation systems/figures with neat diagrams. 06

Q.3 Solve the following.

- A) Define: 06
- i) The Zenith iii) The Latitude v) The Altitude
- ii) The Nadir iv) The Longitude vi) The Declination

- B) Explain Spherical triangle with their properties with formulae in Spherical Trigonometry. 06

Q.4 Solve the following.

- A) Define Transition curve. Explain requirements of Ideal transition curve. Explain objectives of providing transition curves. **06**
- B) Explain in detail: i) Degree of Curve ii) Relation between radius and degree of curve iii) Superelevations. **06**

Q.5 Solve the following.

- A) i) A vertical photograph was taken at an altitude of 1200 m above mean sea level. Determine the scale of the photograph for terrain lying at elevations of 80 m and 300 m if the focal length of the camera is 15 cm. **06**
- ii) A camera having focal length of 20 cm is used to take a vertical photograph to a terrain having an average elevation of 1500 m. What is the height above sea level at which an air-craft must fly in order to get the scale of 1:8000?
- B) a) Explain: **06**
- i) Mosaic and its type.
- ii) Stereoscopy and Photo interpretation.
- b) The scale of an aerial photograph 20cm x 20cm is 1cm=100m. Determine the number of photographs required to cover an area of 8km x 12.5km, if the longitudinal overlap is 60% and side overlap is 30%.

Q.6 Solve any one of the following.

- A) Write uses and applications of i) G.P.S. and ii) G.I.S. in Civil Engineering. **06**
- B) Explain the Idealized Remote sensing system and their stages with neat sketch **06**

***** Paper End *****