



# MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : CE(PC)403 Surveying & Geomatics

UPID : 004447

Time Allotted : 3 Hours

Full Marks : 70

The Figures in the margin indicate full marks.

Candidate are required to give their answers in their own words as far as practicable

## Group-A (Very Short Answer Type Question)

1. Answer any ten of the following : [ 1 x 10 = 10 ]
- (I) Detailed plotting is generally done by-----
  - (II) Straight, parallel and widely spaced contours represent which type surface?
  - (III) The curve composed of two arcs of different radii having their centres on the opposite side of the curve, is known \_\_\_\_\_
  - (IV) The number of horizontal cross wires in a stadia diaphragm is \_\_\_\_\_
  - (V) The imaginary line passing through the intersection of cross hairs and the optical centre of the objective, is known as \_\_\_\_\_
  - (VI) A clinometer is used for \_\_\_\_\_
  - (VII) The chord of a curve less than peg interval, is known as \_\_\_\_\_
  - (VIII) The desired sensitivity of a bubble tube with 2 mm divisions is 30". The radius of the bubble tube should be \_\_\_\_\_
  - (IX) For a tachometer the additive and multiplying constants are respectively----- & -----
  - (X) If the focal length of the object glass is 25 cm and the distance from object glass to the trunnion axis is 15 cm, the additive constant is \_\_\_\_\_
  - (XI) The smaller horizontal angle between the true meridian and a survey line, is known as-----?
  - (XII) Subtense bar is an instrument used for which purpose?

## Group-B (Short Answer Type Question)

Answer any three of the following : [ 5 x 3 = 15 ]

2. Give in a tabular form, the difference between prismatic compass and surveyor's compass. [ 5 ]
3. What is Magnetic declination? What are different types of variation in declination? [ 5 ]
4. Describe how you would range a survey line between two points which are not intervisible. [ 5 ]
5. Discuss the characteristics of contours. Give suitable sketches. [ 5 ]
6. Explain the Bowditch and transit rule for adjustment of closing error in theodolite surveying. [ 5 ]

## Group-C (Long Answer Type Question)

Answer any three of the following : [ 15 x 3 = 45 ]

7. (a) Explain Levelling with the three Screw Levelling head. [ 5 ]
- (b) A 30m chain used to measure the length of a line was tested before the line was measured and was found to be 29.95m long. The line was measured and the length was recorded as 590.48m. The chain was tested again and was found to be 30.08m long. Find the true length of the line. [ 5 ]
- (c) Draw a curve and describe minimum 10 elements in it. [ 5 ]
8. (a) What is meant by closing error in a traverse? Explain the methods of adjusting closing errors in a theodolite traversing [ 5 ]
- (b) Explain the theory to solve three point problems. [ 5 ]
- (c) The following readings are successively taken from an instrument in a leveling work: 0.224, 0.354, 0.565, 1.765, 1.890, 2.400, 1.765, 0.330, 0.875, 1.245. The position of the instrument was changed after taking the 3rd and 6th readings. Draw out the level field book. If the RL of the first point was 100.00, calculate the RL of all other points using rise and fall method. Apply the check. [ 5 ]
9. (a) What are the various corrections that can be applied in Base Line measurement? [ 5 ]
- (b) What do you mean by Designation of Curve? Explain its various different methods. [ 5 ]

- (c) Explain direct methods of locating contours. [ 5 ]
10. (a) Define the following terms in astronomy: (i) Celestial sphere (ii) Celestial horizon (iii) Observers meridian (iv) Vertical circle (v) Prime vertical [ 5 ]
- (b) The following consecutive readings were taken with a level and 5m levelling staff on a continuously sloping ground at a common interval of 20 m, :0.385, 1.030,1.925,2.825,3.730,4.685,0.625,2.005,3.110,4.485. Prepare a page of field book and calculate the reduced level of points if first reading was taken on a bench mark of RL 208.125 m [ 5 ]
- (c) Define bearing. Which are the different systems of designating bearings? [ 5 ]
11. (a) Explain the terms with reference to contouring: (i) contour interval (ii) contour gradient (iii) interpolation of contour (iv) horizontal equivalent [ 5 ]
- (b) Discuss the different systems of tachometric measurements. [ 5 ]
- (c) How would you determine tachometric constants? [ 5 ]

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