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CE – 403

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 0023

Roll No.

B. Tech.

(SEM. IV) EXAMINATION, 2006-07

ADVANCE SURVEYING

Time : 3 Hours]

[Total Marks : 100

- Note :*
- (1) Attempt all questions.*
 - (2) Assume data suitably, if not given.*

1 Attempt any **four** parts of the following : **5×4=20**

- a) What are different types of alidades? Discuss the use of Telescopic alidade.
- b) Describe the procedure for setting up a plane table over a station.
- c) What is orientation? What are different methods of orientation of a plane table.
- d) Discuss the method of drawing contours using plane table survey.
- e) What are different types of errors in plane table surveying? How would you minimize them?
- f) Describe Lehmann's rules with the help of neat sketches.

2 Attempt any **four** parts of the following : **5×4=20**

- a) Differentiate between :
 - (i) Triangulation and traversing.
 - (ii) Triangulation and trilateration.
- b) What is meant by strength of figure? How would you determine it?
- c) What is extension of base? How is it done?
- d) Discuss the various correction for base line in brief.
- e) What is satellite station? How would you reduce the horizontal angles?
- f) A 30 m tape standardized in catenaries as 29.990 m at 100 n is used in the field with a tension of 80 N in catenary. Calculate the sag correction of the mass of the tape is 0.03 kg/m.

3 Attempt any **two** parts of the following : **10×2=20**

- a)
 - i) Explain the method correlates. What are its advantages over the normal equation method?
 - ii) How would you adjust a level line circuit?
- b) Directions are observed from a satellite station 200 m from station C with the following results :
A = 00° 00' 00"
B = 62° 15' 24"
C = 280° 20' 12"

The approximate lengths of AC and BC are 25,200 m and 35,000 m respectively. Calculate the angle ACB.

- c) Prove by least square method, if the observations of a quantity are in correlated and of different weights, the most probable value of the quantity is the weighted arithmetic mean of the observations.

4 Attempt any **four** parts of the following : **5×4=20**

- a) What are different methods of designation of a curve? Derive a relationship between the radius and the degree of curve.
- b) How would you select a suitable peg interval for a circular curve? What do you understand by unit chord and sub-chord?
- c) What is a reverse curve? Give various relationships between various elements of a reverse curve.
- d) Determine the ordinates of the points on a circular curve having a long chord of 100 m and versed sine of 5 m. The ordinates are to be measured from the long chord at an interval of 10m.
- e) What are the basic criteria for the design of a transition curve? Derive an expression for super-elevation. What are the advantages of transition curve?
- f) Derive an equation of a vertical curve in term of two gradients and length of the curve.

5 Attempt any **two** parts of the following : **10×2=20**

- a) Explain the salient features of route surveying of a canal. How does this differ from that of a highway?

- b)
 - i) Find the azimuth and the hour angle of the sun at sunset for a place of latitude 49° , its declination being given to be 19°S .
 - ii) Explain celestial latitude and longitude co-ordinate system with neat sketch.
 - c) Explain the following term with the help of neat sketches :
 - i) First point of arise
 - ii) Equinoctial points
 - iii) Right Ascension
 - iv) Hour angle
 - v) Celestial and observer's meridian.
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