CIVIL ENGINEERING DEPARTMENT
Motilal Nehru National Institute of Technology Allahabad

B. Tech. V Sem. (Civil Engg.) **End Semester Examination** **2017-18 (Odd Semester)**

Survey-II (CE- 1501)

Time: 3 hrs **MM: 60**

Note: 1. Attempt ALL questions.

2. Answers should be clear, crisp and concise. Missing data, if any, may be assumed suitably.

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1. Attempt all parts: (2 x 4 = 8)
   (a) State the principle of least squares. Derive most probable value of a quantity with large number of direct observations.
   (b) Find the most probable values of angles A, B and C of a triangle ABC from the following data using the method of normal equations:

A = 77°14'20"	wt = 2
B = 49°40'35"	wt = 3
C = 53°04'50"	wt = 2

2. Attempt all parts: (2 x 4 = 8)
   (a) A tower was photographed at a flying altitude of 1540 m above msl. The distance of image of top of the tower is 7.25 cm and the relief displacement is 0.63 cm. Compute the height of tower if the elevation of bottom of tower is 670 m above msl.
   (b) Describe independent equatorial astronomical coordinate system used to locate celestial bodies. Draw neat sketches with proper explanation of each term used.

3. Attempt all parts: (2 x 4 = 8)
   (a) What is an ideal remote sensing system? Explain its components briefly.
   (b) Explain how coniferous and deciduous trees can be delineated using remote sensing satellite data.

4. Attempt all parts: (2 x 4 = 8)
   (a) What is scatter plot? Explain minimum distance to mean classifier.
   (b) Write down the basic steps in unsupervised classification.

5. (a) Briefly explain: (2 x 2 = 4)
   (i) Composition of GPS Signal (ii) Differential positioning in GPS
   (b) Differentiate between: (2 x 2 = 4)
   (i) A/S and S/A (ii) Ellipsoidal and Orthometric heights

6. Attempt all parts: (2 x 5 = 10)
   (a) Find the altitude and hour angle for a star when it is on prime vertical. The declination of the star is 24°40'N and the latitude of the observer is 53°40'N.
   (b) An area of 5.0 km x 4.5 km is to be photographed with a 152.4 mm focal length camera. Calculate the number of photographs required to cover this area at a scale of 1:8000 if format of photograph is 23 cm x 23 cm. Take longitudinal overlap as 60% and lateral overlap as 20%.

7. Attempt all parts: (2 x 5 = 10)
   (a) Explain the procedure of creating an integrated geographic database.
   (b) The area of a forest is 25 km^2 (5 km x 5 km). Out of this, 9 km^2 area is covered by deciduous trees (Average height = 3.4m), 6.25 km^2 area is covered by coniferous trees (average height = 2.7m) and the remaining area is covered by mangrove (average height = 1.8m). Assume suitable coordinates system and scale to create GIS database (map and attribute table both) for this forest area by suitably placing each component of forest area.