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Printed Pages : 3

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BT-4 / M–14

SURVEYING–II

Paper–CE–210 E

Time allowed : 3 hours] *[Maximum marks : 100*

Instructions :

*(i) There are **eight** questions in this paper. All questions carry equal marks.*

*(ii) Attempt **five** questions in all selecting at least **one** from each unit.*

Unit–I

1. (a) Derive a relationship for axis signal correction in geodetic trigonometric leveling. 10

   (b) Following reciprocal observation were made from two points P and Q. PQ = 6996 m, Angle of elevation of Q at P = 1° 56' 10", Angle of depression of P at Q = 1°56'52". Height of Instrument at P and Q = 1.42 m. Height of signal at P and Q = 4.07 m. Find the difference in level between P and Q and the refraction correction. Rsin 1" = 30.88 m. 10

2. (a) From an eccentric station S, 12.25 m to the west of main station B, following angles were measured, BSC = 76° 25'32", CSA = 54° 32'20" The station S and C are on the opposite side of the line AB. Calculate correct angle ABC, Lengths AB = 5286.5 m, BC = 4932.2 m respectively. 10

   (b) What is meant by eccentricity of signal ? How would you correct the observation when made upon an eccentric signal ? 10

Unit–II

3. (a) Three angles A, B and C are observed at a station D closing the horizon, along with their probable errors is provided below. Determine their corrected values.

   A = 78° 12'12" ±2", B = 136° 48' 30" ±4" and

   C = 144° 59' 08" ± 5" 10

   (b) What is normal equation ? Discuss with an example how to derive normal equation of an unknown. 10

4. (a) Explain in detail about laws of random errors. Provide suitable diagram, if necessary. 10

   (b) Adjust the following angles closing the horizon :

   A = 110° 20' 48" weight = 4 ; B = 92° 30' 12" weight = 1 ; C = 56° 12' 00" weight = 2, D = 100° 57' 04" weight = 3. 10

Unit–III

5. (a) Determine hour angle and declination of a star from the following data : http://www.kuonline.in

   Altitude of a star = 21° 30'; Azimuth of the star = 140° E and latitude of observer = 48° N 10

   (b) Write a detailed note on various coordinate systems used in astronomy. 10

6. (a) Derive suitable relations to calculate hour angle, latitude and azimuth when star is at elongation using Napier's rule of right angled triangle. 10

(b) Find LMT from the following data : LAT = 15h 12m 40s, ET at GMN = 5m 10.65s, additive to apparent time and increasing at 0.22s / hour; longitude of the place = 20°30' W 10

Unit–IV

7. (a) Derive parallax equation for determining elevation and ground coordinate of a point. 10

(b) A section line AB appears 10.16 cm on photograph for which the focal length = 16 cm. The corresponding line measures 2.54 cm on a map which is to a scale of 1/50,000. The terrain has an average elevation of 200 m above msl. Calculate flying height of the aircraft above msl. 10

8. (a) A tower lying on flat area having an average elevation of 800 m above msl was photographed with a camera of focal length = 24 cm. The distance between the image of top and bottom of the tower measures 0.34 cm on photograph. A line AB = 200 m on ground measures 12.2 cm on the same photograph. Determine height of the tower if the distance of the image of the top of the tower is 8.92 cm from principal point. 10

(b) Write a detailed note on aerial camera. Provide a suitable diagram. 10