[Total No. of Questions - 9] [Total No. of Printed Pages - 4]
(2063)

821

B. Tech 4th Semester Examination

Surveying-II

CE-4005

Time : 3 Hours **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/ continuation sheet will be issued.

Note : Attempt Five question in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the question E. Use of non-programmable calculator is allowed.

SECTION - A

1. Explain the method used to decide the inter visibility of stations. Two triangulation stations A and B are 90 km apart. The elevation of A is 418.85 m and that of B is 702.63 m. An intervening peak is 66 km from A and has an elevation of 524.6 m. Check the inter visibility from A to B and also required height of the signal at B for clear visibility. The line of sight must pass at least 2.5 m above ground level. **(20)** **(20)**

2. To determine the difference in level between two stations A and B, 4996.8 m apart, the reciprocal trigonometric levelling was performed and the readings in following table were obtained. Assuming the mean earth's radius as 6366.20 km and the coefficient of

refraction as 0.071 for both sets of observations, compute the observed value of the vertical angle of A from B and the difference in level between A and B.

Instrument at	Height of Instrument (m)	Target at	Height of Target (m)	Mean vertical Angle
A	1.6	B	5.5	1°15'32"
B	1.5	A	2.5	—

(20)

SECTION - B

3. Find the least square estimate of the quantity x from the following data:

X (m)	Weight
2x = 292.500	$W_1 = 1$
3x = 438.690	$W_2 = 2$
4x = 585.140	$W_3 = 3$

(20)

4. What is weight of quantity? How would you allocate weights to different quantities? Discus various laws of weights. Also discuss the various indices of precision for observation of equal and unequal weights. **(20)**

SECTION - C

5. Briefly describe the various coordinate systems used to locate celestial bodies with neat sketches. **(20)**

6. Describe the steps of conversion of LST to LMT and vice versa. Find the LST corresponding to 4:45 AM on Jan 26, 1953 at a place in longitude 68°12' W, the GST of GMM being 8h 19m 57.53s. **(20)**

SECTION - D

7. Derive an expression for the distortion due to ground relief in aerial photographs. A tower 50m high, appears in a vertical photograph taken at a flight altitude of 2500 m above mean sea level. The distance of the image of the top of the tower is 6.35 cm from principal point. Compute the displacement of the tower with respect to the image of its bottom. The elevation of the bottom of the tower is 1250m. **(20)**

8. What do you understand by remote sensing? Briefly explain the various components of remote sensing system. List and briefly describe the different interactions occurring between objects of the Earth's surface and incoming electro-magnetic radiation. What is a spectral reflectance curve and what are its utilities in remote sensing? Explain with suitable examples. **(20)**

SECTION - E

9. Attempt all parts:

   a. Flow Sidereal time is converted to mean time

   b. What is meant by a satellite station?

   c. Describe Astronomical Triangle with neat sketches.

   d. Write a short note on Mirror stereoscope

e. If the Greenwich civil time is 8 h 30 m 15s P.M., find the Local Mean Time (LMT) of the following places

(A) 82°30′E (B) 120°W

f. Explain the objectives and basic principle of triangulation.

g. What are raster and vector? Give advantages and disadvantages of raster data over vector data.

h. Aerial photographs were taken with a camera having focal length of 180 mm. The average elevation of the ground in the photograph was 160 m. Find the scale of the map if the flying height was 2500m.

i. Explain the term axis signal correction as used in Trigonometric leveling.

j. What is weight of quantity? How would you allocate weights to different quantities? **(2×10=20)**