[Total No. of Questions - 9] [Total No. of Printed Pages - 3] (2125)

15096

B. Tech 4th Semester Examination

Surveying-II (OS)

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. How would you determine the difference in elevations of the instrument station and the top of a chimney, if the base of the chimney is (a) accessible; (b) inaccessible. (20)

2. To ascertain the verticality of a large chimney, two stations A and B were established for making observations on the chimney such that the chimney was left of line AB. Following observations were made from A and B on the centre points of top (T) and bottom (M) of the chimney :

   Angle MAB = 59°28'14", Angle TAB = 59°04'10", Angle MBA = 55°18'16",

   Angle TBA = 55°55'50". The height of Chimney was measured as 60 m and the coordinates of A and B were assumed to be (E 100, N 180) and (E 160, N 100), respectively. Calculate the angle of the non verticality of the chimney. (20)

[P.T.O.]

SECTION - B

3. Discus the use of theory of least squares. How would you form the normal equations using the theory of least squares? How the normal equations are formed in practice? (20)

4. Given the following observation equation, find the most probable values of A, B, and C.

   A $=38°12'26.5''$, weight = 1; B $= 32°45'13.2''$, weight = 2

   A+B $= 70°57'38.6''$, weight = 2 A + B+C= $59°32'45''$, weight = 3

   B + C $=88°15'37.8''$, weight = 1 (20)

SECTION - C

5. Explain the (a) extra meridian observation of the sun and (b) extra meridian observation of a circumpolar star or of star near the prime vertical methods of determining Azimuth of a line. (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. An area of 8 km × 10 km is to be photographed to a scale of 1:20,000 using an aerial camera of focal length 15 cm. The terrain is at average level of 600m above msl. The photographs are 22.5 cm square. The speed of the plane is 75 km per hour. Assume the longitudinal and lateral overlaps as 60% and 20%, respectively. Calculate

   (a) Flight altitude above msl.

   (b) Ground coverage in each photograph.

   (c) Time interval between exposures.

   (d) Number of photographs per strip

   (e) Number of strips. (20)

8. Answer the following:

   (a) What is a spectral reflectance curve and what are its utilities in remote sensing? Explain with suitable examples.

   (b) What is GNSS or GPS? Describe the functional segments of GPS. Discuss how a GPS works and the techniques used. (20)

SECTION - E

9. Attempt all parts:

   (a) What is meant by (i) a Sidereal day, (ii) Apparent Solar day, (iii) Mean Solar day.

   (b) Explain the operation of along-track scanner and across track scanners.

   (c) Draw the astronomical triangle when the star is at horizon.

   (d) Explain Geosynchronous and Sun synchronous orbits.

   (e) Distinguish between spatial and non spatial data used in GIS.

   (f) Explain the objectives and basic principle of triangulation.

   (g) Write a note on Atmospheric scattering of EM radiations,

   (h) What is a satellite station?

   (i) How is the refraction correction determined from reciprocal observations.

   (j) Convert 7 h 45 m 50 s mean solar time to sidereal time interval. (10×2=20)