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B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Fourth Semester

Civil Engineering

CE 239 — SURVEYING II

Time : Three hours
Maximum : 100 marks

Draw neat sketches whereever necessary.

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Distinguish between fixed hair and movable hair method in tacheometry.

2. Write short note on substance bar.

3. What do you mean by sun signals in trigonometry survey?

4. Explain the role of satellite station in control surveying.

5. Find the most probable value of the angle from the following observations.

   P = 40°20'12"   2P = 80°40'20"   6P = 242°01'06"

6. Write the principle of least squares in control surveying.

7. Define celestial sphere.

8. What do you mean by Nautical almanac?

9. Write short note on photogrammetry.

10. What are the concepts of cartography?

PART B — (5 × 16 = 80 marks)

11. (a) (i) How will you calculate the horizontal and vertical distances between a instrument station and staff station when the line of collimation is inclined and the staff is held vertically? (8)

   (ii) A line was leveled tacheometrically with a tachemeter fitted with an anallatic lens, the value of the constant being 100. The following observations were made, the staff having been held vertically :

Instrument Station	Height	Staff at	Vertical Angle	Staff Readings	Remarks
A	1.44	B.M	–2°24'	1.20, 1.83, 2.46	RL 37.725 m
A	1.44	B	+4°36'	1.35, 1.82, 2.29	
B	1.41	C	+6°12'	0.72, 1.38, 2.04	

Compute the elevations of A, B and C. (8)

Or

(b) (i) What is tacheo metric surveying and state the advantages and disadvantages. Explain the characteristics of instruments employed in tacheo metric surveying. (8)

   (ii) Explain the method for determining tacheo metric contants. (8)

12. (a) (i) How will you apply the correction for pull and correction for Sag in the base line measurement. (8)

   (ii) A steel tape is 30 m long at a temperature of 15°C when lying horizontally on the ground. Its sectional area is 0.08 sq.cm, its weight 1.8 kg and the coeff. of expansion which are at the same level and at equal intervals. Calculate the actual length between the end graduations under the following conditions :
   Temperature = 25° C ; Pull = 18 kg. (8)

Or

(b) (i) What are the different classification of Triangulation system? (4)

   (ii) What is mean by "a Satellite station"? Explain the reasons for using it during a trignometrical survey. Directions were observed from a satellite station, 68 m from station C, with the following results :

   A. 0° 0' 0" ;

   B. 71° 54' 32" .25

   C. 296° 12' 00"

   The approximate lengths of AC and BC are respectively 18024 m and 23761 m. Compute the angle subtended at station C. (12)

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13. (a) (i) How will you estimate the probable error with

   (1) Direct observation of equal weight

   (2) Direct observation of unequal weight. (8)

   (ii) Find the most probable values of the following station observations closing the horizon :

   A = 28° 24' 28".4 Weight 2

   B = 32° 14' 16".3 Weight 1

   A + B = 60° 38' 50".7 Weight 1

   C = 299° 21' 11".8 Weight 2

   B + C = 331° 35' 27".8 Weight 3

   (8)

Or

(b) (i) What are the various values for correction to the observed angle of a triangle to be adopted. (8)

   (ii) The following observations were made on three stations A, B and C from station O, stations B and O being on the same side of AC.

   AOB = 30° 23' 12" ; BOC = 40° 36' 48" ; AB = 2112.5 m ; BC = 2537.5 m ; ABC = 125° 12' 20". Find the corrected angles. (8)

14. (a) (i) Name the different celestial co-ordinate systems. (4)

   (ii) Explain in details any one celestial co-ordinate system. (12)

Or

(b) (i) Distinguish between Zenith and Nadir.

   (ii) The following observations of the sun were taken for azimuth of a line in connection with a survey :

   Mean time = $16^h 30^m$

   Mean horizontal angle between the sun and the referring object = 18° 20' 30"

   Mean corrected altitude = 33° 35' 10"

   Declination of the sun from N.A = + 22° 05' 36"

   Latitude of place = 52° 30' 20"

   Determine azimuth of line.

15. (a) (i) What is the principle of electronic distance meter? (2)

   (ii) How will you conduct the survey using the modem surveying equipments? (14)

Or

(b) (i) Define Hydrographic surveying. (2)

   (ii) A, B and C are three visible stations in a hydrographical survey. The computed sides of the triangle ABC are : AB, 1130 m ; BC, 1372 m ; and CA, 1889 m. Outside this triangle (and nearer to AC), a station P is established and its position is to be found by three point resection on A, B and C, the angles APB and BPC being respectively 42° 35' and 54° 20'.

   Determine the distances PA and PC. (14)

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