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Question Paper Code : 50330

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

Third Semester

Civil Engineering

CE 8351 – SURVEYING

(Common to : Environmental Engineering)

(Regulations – 2017)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Convert the following whole circle bearings to reduced bearings: (a) $121^{\circ}30'$
(b) $256^{\circ}15'$
2. What is reciprocal ranging?
3. Define the terms face left and face right observations.
4. What is the need for curvature and refraction correction in leveling?
5. What is meant by reduction to centre?
6. State the principle of least squares.
7. List the different equipment needed for making soundings.
8. Differentiate between Zenith and Nadir.
9. What is a Total Station and why is it called so?
10. What is the principle of trilateration?

PART B — (5 × 13 = 65 marks)

11. (a) The following consecutive readings were taken with a level on continuously sloping ground at a common interval of 20 m. The last station has an elevation of 155.272 m. Rule out a page of level book and enter the readings. Calculate the reduced levels of the points by rise and fall method, and also the gradient of the line joining the first and last points.
0.420, 1.115, 2.265, 2.900, 3.615, 0.535, 1.470, 2.815, 3.505, 4.445, 0.605, 1.925, 2.885.

Or

- (b) Determine the values of included angles in the closed compass traverse ABCDE conducted in clockwise direction, given following fore bearings of their respective lines. Also apply the check for closed traverse.

Line	FB
AB	40°
BC	70°
CD	155°
DE	210°
EA	325°

12. (a) What is tacheometric surveying? Explain the different methods of tacheometric surveying.

Or

- (b) Explain the procedure for measuring (i) Horizontal angle by repetition, (ii) Horizontal angle by reiteration and (iii) Vertical angle, using theodolite. (5+4+4)

13. (a) From an eccentric station S, 12.25 meters to the west of the main station B, the following angles were measured $\angle BSC = 76^\circ 25' 32''$; $\angle CSA = 54^\circ 32' 20''$. The stations S and C are to the opposite sides of the line AB. Calculate the correct angle ABC if the lengths AB and BC are 5286.5m and 4932.2 m respectively.

Or

- (b) The following angles were measured at a station:

$$A = 20^\circ 10' 14'' \text{ weight } 2$$

$$B = 30^\circ 15' 20'' \text{ weight } 3$$

$$C = 42^\circ 02' 16'' \text{ weight } 3$$

$$A+B = 50^\circ 25' 37'' \text{ weight } 3$$

$$B+C = 72^\circ 17' 34'' \text{ weight } 3$$

$$A+B+C = 92^\circ 27' 52'' \text{ weight } 1$$

Find the most probable values the angles A, B and C.

14. (a) What is a three point problem? Explain the different solutions available for a three point problem.

Or

- (b) With neat sketches explain the different celestial coordinate systems.

15. (a) With neat sketches explain the different parts and working principle of an electronic total station.

Or

- (b) Explain the different components and working of a GPS system.

PART C — (1 × 15 = 15 marks)

16. (a) In a harbour development scheme at the mouth of a tidal river, it has been found necessary to take soundings in order to buoy the navigation channel. Explain clearly how you would determine the levels of points on the river bed and fix the positions of the soundings.

(i) by use of sextant in a boat.

(ii) by use of the theodolite on the shore.

Or

- (b) You are required to prepare the map of a hilly terrain. Choose a suitable method of surveying and describe the process of obtaining the necessary details for preparing the map.