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Question Paper Code : 50532

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Third Semester

Civil Engineering

CE 3351 – SURVEYING AND LEVELLING

(Common to: Environmental Engineering/Agricultural Engineering)

(Regulations 2021)

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Time : Three hours

Maximum : 100 marks

Assume suitable data wherever necessary

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write the principles of surveying.
2. List down the methods of Ranging.
3. Define Benchmarks and list its types.
4. Write a few words on Datum.
5. List out the steps in temporary adjustments of theodolite surveying.
6. Compare Theodolite and Tacheometer.
7. Define Traversing.
8. List the errors which are eliminated in measurement of horizontal angles by repetition method.
9. Write down the principles of GPS.
10. Write any two advantages of total station.

PART B — (5 × 13 = 65 marks)

11. (a) Prepare a list of accessories required for a chain survey. Explain the functions of each accessory.

Or

- (b) The following bearings were observed with a compass. Work out the local attraction. Find the correct bearings.

Line	F.B	B.B
AB	74° 0'	254°
BC	91° 0'	271° 0'
CD	166°	343° 0'
DE	177° 0'	0° 0'
EA	189° 0'	9° 0'

12. (a) Describe the effects of curvature and refraction in Levelling.
Or
(b) Describe the sources of error in levelling and explain them in detail.
13. (a) Discuss about various methods of measuring horizontal angle using a theodolite.
Or
(b) Brief the types of errors that may occur in Tacheometry and write the precautions to be done to avoid those errors.
14. (a) Illustrate the general principles of Least Square method and write its application.
Or
(b) Describe the triangulation adjustment and explain the different conditions and cases with sketches.
15. (a) Explain the characteristics of GPS navigation and satellite navigation systems.
Or
(b) List out the features of Total station and brief its merits and demerits.

PART C — (1 × 15 = 15 marks)

16. (a) On a closed corn pass, traverse survey PQRST, Following are the observation made with a suspicion of local attraction.

LINE	F.B	B.B.
PQ	147° 3'	26° 45'
QR	74° 30'	253° 00'
RS	41° 30'	222° 45'
ST	312° 15'	132° 45'
TP	219° 15'	39° 15'

Identify the station affected with local attraction.

Or

- (b) Determine the difference of levels of points P and Q and the R.L of P from the following data:

Horizontal distance between P and Q = 7118

Angle of depression to P and Q = $1^{\circ}32'12''$

Height of signal at P = 3.87 m

Height of instrument at Q = 1.27 m

Coefficient of Refraction = 0.07

$R \sin 1'' = 30.99 \text{ m}$

$m = 0.07$

R.L of Q = 417.860 m

