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Question Paper Code : 40295

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

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. Differentiate true bearing and magnetic bearing.
2. Differentiate GTS Bench mark and Permanent Bench mark.
3. Define Contour gradient.
4. Give tacheometric distance equation on flat and sloped terrains.
5. What is a satellite station?
6. What is reciprocal levelling? When it is done?
7. Differentiate error and precision.
8. Define strength of fix.
9. What is a total station? What is its working principle?
10. Define Anti Spoofing.

PART B — (5 × 13 = 65 marks)

11. (a) Describe the method of ranging a line across a ridge, when the terminal stations are not visible. (13)

Or

- (b) What are permanent adjustments of a dumpy level? How can it be checked and rectified? (13)

12. (a) Define contour. What are its uses? Explain with neat sketches. (13)

Or

- (b) A tacheometer was set up at a station Q and the readings on a vertically held staff at P and SM are as under : (13)

Staff station	Vertical angle	Staff readings			
P	08° 24'	2.255	2.605	2.955	
BM	01° 06'	1.640	1.920	2.200	

Calculate the horizontal distance between Q and P and the elevation of P, if the RL of BM is 417.685m. The multiplying and additive constants of the instruments were respectively 100 and 0.3.

13. (a) For the following traverse, adjust for closing error if any. (13)

Line	Length (m)	Bearing
AB	130	S 88° 00' E
BC	158	S 06° 00' E
CD	145	S 40° 00' W
DE	308	N 81° 00' W
EA	337	N 48° 00' E

Or

- (b) Determine the most probable value of an angle x from the following observations of equal weight. (13)

$$X = 30^\circ 30' 30'' \quad 2X = 600^\circ 00' 55''$$

$$2X = 60^\circ 00' 55''$$

$$3X = 183^\circ 02' 40''$$

14. (a) What are the various systems of coordinates employed to locate the position of a celestial body? Explain any one. (13)

Or

- (b) What do you understand by sidereal day, apparent solar day and mean solar day? State the relation between sidereal time, right ascension and hour angle. (13)

15. (a) Describe the sources of error in GPS. What is meant by Selective Availability? (13)

Or

- (b) State the advantages of Total station over conventional surveying. What the errors in Total station survey? (13)

PART C — (1 × 15 = 15 marks)

16. (a) The following bearings were recorded for a closed compass traverse :

Line	Fore Bearing	Back Bearing
AB	74° 15'	256° 00'
BC	107° 15'	286° 15'
CD	224° 45'	44° 45'
DA	307° 45'	127° 00'

Which stations are affected by local attraction and determine the correct bearings. Also find the true bearings if the declination was 02° 15' West.

Or

- (b) The following bearings were successively taken with a 4m levelling staff on a continuously sloping ground at a common interval of 30m, 0.855 (on A), 1.545, 2.335, 3.115, 3.825, 0.455, .380, 2.055, 2.855, 3.455, 0.595, 1.015, 1.850, 2.755, 3.845 (on B).

The RL of A was 380.500. Make a level book and apply usual checks. Determine the gradient of the line AB.