

4. (a) What is the difference between compound and vertical curve ? Explain with diagram. 7.5
- (b) Two straight AB and CD intersect at V. BD is the common tangent of length 200 metres. It is proposed to introduce a reverse curve consisting of two arcs of equal radii between them. The angles ABD and CDB are  $150^{\circ}30'$  and  $43^{\circ}42'$  respectively. Calculate (i) the common radius, (ii) the chainage of P.C., P.R.C. and P.T., if that of B is 9245.2 metres. 7.5

### Section C

5. (a) What is triangulation ? Explain the classification of triangulation system. 7.5
- (b) The altitude of two proposed stations A and B 130 km apart are respectively 220 m and 1160 m. The altitude of two points C and D on the profiles between them are respectively 308 m and 632 m, the distances being AC = 50 km and AD = 90 km. Determine whether A and B are intervisible and if necessary, find the minimum height of a scaffolding at B, assuming A as the ground station. 7.5

**MAR-21-210047**

**B. Tech. EXAMINATION, March 2021**

Semester IV (CBCS)

ENGINEERING SURVEYING-II

CE-403

Time : 2 Hours

Maximum Marks : 60

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*The candidates shall limit their answers precisely within 20 pages only (A4 size sheets/assignment sheets), no extra sheet allowed. The candidates should write only on one side of the page and the back side of the page should remain blank. Only blue ball pen is admissible.*

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**Note :** Attempt *Four* questions in all, selecting *one* question from each Sections A, B, C and D. All questions carry equal marks.

### Section A

1. (a) A tape of 30 m length suspended in catenary measured the length of a base line. After applying all corrections the deduced length of the base line was 1462.36 m. Later on it was

found that the actual pull applied was 155 N and not the 165 N as recorded in the field book. Correct the deduced length for the incorrect pull. The tape was standardized on the flat under a pull of 85 N having a mass of 0.024 kg/m and cross-sectional area of 4.12 mm<sup>2</sup>. The Young's modulus of the tape material is 152000 MN/m<sup>2</sup> and the acceleration due to gravity is 9.806 m/s<sup>2</sup>. **6**

(b) A tacheometer was set up at station A and the following readings were obtained on a vertically held staff : **9**

Station	Staff station	Vertical angle	Hair reading	Remarks
A	B.M	-2° 18'	3.225, 3.550 And 3.875	R.L. of B.M. is 435.655 m
	B	+8° 36'	1.650 2.515 And 3.380	

Calculate the horizontal distance from A to B and the R.L. of B, if the constants of the instrument were 100 and 0.4.

2. A theodolite has a tacheometric multiplying constant of 100 and an additive constant of zero. The centre reading on a vertical staff held at point B was 2.292 m when sighted from A. If the vertical angle was + 25° and the horizontal distance AB 190.326 m, calculate the other staff readings and show that the two intercept intervals are not equal. Using these values, calculate the level of B if A is 37.950 m angle of depression and the height of the instrument is 1.30 m. **15**

### Section B

3. (a) List out the different transition curve. Explain the characteristics of transition curve in detail. **3+4**

(b) Two tangent of a circular curve of radius 350 metres have a deflection angle of 90°. It is proposed to change the position of the forward tangent by rotating it through 20°, thus making the deflection angle equal to 110°. Calculate the radius of the new curve if P.C. is unchanged. **8**

- (b) What is ideal transition curve ?
- (c) What are the principle of least square ?
- (d) What is meant by satellite station ?
- (e) Explain different parts of total station.  $3 \times 5 = 15$

- 6. (a) Explain the different types of correction needed in triangulation survey. **7.5**
- (b) A line PQ 2100 m long, lying at an elevation of 400 m measures 10.08 m above on a vertical photograph. If the focal length of the lens is 24 cm, determine the scale of the photograph on an area, the average elevation which is 600 m. **7.5**

#### **Section D**

- 7. (a) What do you understand by remote sensing ? Differentiate between active and passive remote sensing. **7.5**
- (b) What do you understand by electromagnetic spectrum ? State the wavelength regions, along with their uses for remote sensing applications. **7.5**
- 8. (a) What are the component of geographic information system ? Explain in details. **7.5**
- (b) What is the error in GPS ? Explain in detail. **7.5**
- 9. (a) What are the advantages of an anallactic lens used in tacheometer ?