

**B020314(020)**

**B. Tech. (Third Semester) Examination,**

**April-May 2021**

**AICTE**

**(New Scheme)**

**(Civil Engg. Branch)**

**PLANE SURVEYING**

***Time Allowed : Three hours***

***Maximum Marks : 100***

***Minimum Pass Marks : 35***

***Note : Part (a) is compulsory in all the questions.***

***Attempt any two parts from (b), (c) and (d).***

**Unit-I**

**1. (a) Define the following terms :**

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**(i) Benchmark**

**(ii) Parallax**

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- (iii) Level surface
- (iv) Reduced level
- (b) What are the effects of the earth's curvature and atmospheric refraction in levelling? Derive an expression for the correction for curvature and refraction in levelling. 8
- (c) What is meant by the sensitivity of a bubble tube? Describe in detail how you would determine in the field. 8
- (d) Reciprocal levelling was conducted across a wide river to determine the difference in level of points *A* and *B*, *A* situated on one bank of the river and *B* situated on the other. The following results on the staff held vertically at *A* and *B* from level stations 1 and 2, respectively, were obtained. The level station 1 was near to *A* and station 2 was near to *B*. 8

Instrument at	Staff reading on	
	<i>A</i>	<i>B</i>
1	1.485	1.725
2	1.190	1.415

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- (i) If the reduced level of *B* is 55.18 m above the datum, what is the reduced level of *A*?
- (ii) Assuming that the atmospheric conditions remain unchanged during the two sets of the observations, calculate (A) the combined curvature and refraction correction if the distance *AB* is 315 m, and (B) the collimation error.

### Unit-II

2. (a) In a map, it is found that two consecutive contours cross each other. What would you comment? 4
- (b) What are different methods of contouring? Describe any methods with sketch. 8
- (c) Describe the methods of interpolation of contour. 8
- (d) Write short notes on : 8
- (i) The Pantograph
- (ii) Box sextant

### Unit-III

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3. (a) (i) State the procedure involved in bringing the bubble to the center. 2
- (ii) What are the functions of theodolite? 2
- (b) Explain the repetition method of measuring the horizontal angle using transit theodolite and errors eliminated by that method. 8
- (c) What are the different errors in theodolite work? How are they eliminated? 8
- (d) The following data were collected while running a closed traverse ABCDA. 8

Calculate the missing data :

Line	Length (m)	Bearing
AB	330	181°25'
BC	?	89°50'
CD	411	355°00'
DA	827	?

**Unit-IV**

4. (a) (i) What is the principle of plane tabling? 2
- (ii) What is orientation? Why it is done? 2

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- (b) What is a two-point problem? Explain with neat sketch the procedure of solving two-point problem in plane table surveying. 8
- (c) What is meant by plane tabling? What are the different methods of plane tabling? Explain any method in detail. 8
- (d) For the following traverse compute the length  $CD$ , so that  $A, D$  and  $E$  may be in one straight line : 8

Line	Length (m)	Bearing
AB	110	83°12'
BC	165	30°42'
CD	?	346°6'
DA	212	16°18'

**Unit-V**

5. (a) What is super elevation? Why it is provided? 4
- (b) Explain the elements of simple circular curve. Give their relationship. 8
- (c) Derive an expression for ideal transition curve. 8

- (d) The chainage of the intersection point of two straights is 1060 m and the angle of intersection is  $120^\circ$ . If radius of a circular curve to be set out is 570 m and peg interval is 30 m, determine the tangent length, the length of the curve, the chainage at the beginning and end of the curve, the length of the long chord. 8