

**BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT**

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code 

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Third Semester B.E. Degree Examinations, September 2024

**ENGINEERING SURVEY**

Duration: 3 hrs

Max. Marks: 100

Note: 1. Answer any FIVE full questions choosing ONE full Question from each Module.  
2. Missing data, if any, may be suitably assumed

<u>Q.No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PI)</u>
<b>Module-1</b>			
1.	a. Define surveying. Explain classification of surveying.	10	(2 :1: 1.2.1)
	b. Explain principles of surveying.	06	(2 :1: 1.2.1)
	c. Differentiate between plane surveying and geodetic surveying.	04	(2 :1: 1.2.1)
<b>(OR)</b>			
2.	a. Differentiate between prismatic compass and surveyor compass.	08	(2 :1: 1.2.1)
	b. Adjust bearings of lines of a given traverse which are affected by local attraction.	08	(2 :1: 1.2.1)

Line	FB	BB
AB	38 <sup>0</sup> 30'	219 <sup>0</sup> 15'
BC	100 <sup>0</sup> 45'	278 <sup>0</sup> 30'
CD	25 <sup>0</sup> 45'	207 <sup>0</sup> 15'
DE	325 <sup>0</sup> 15'	145 <sup>0</sup> 15'

- c. Define the following: 04 (2 :1: 1.2.1)  
(i) Meridian (ii) Bearing (iii) Fore Bearing (iv) Isogonal line

**Module-2**

3. a. Explain different methods of levelling. 08 (2 :2: 1.2.1)  
b. Enter the following readings in level book and determine RL of the points. Instrument is shifted after taking 2<sup>nd</sup>, 4<sup>th</sup> and 8<sup>th</sup> reading. 0.875, 1.235, 2.310, 1.385, 2.930, 3.125, 4.125, 0.120, 1.875, 2.030 and 3.765 (all readings in "m"). Assume RL of bench mark as 231m. 12 (2 :2: 1.3.1)
- (OR)**
4. a. Explain reciprocal levelling with neat figure. 08 (2 :2: 1.2.1)  
b. A railway embankment 400 m long is 12 m wide at the formation level and has the side slope 2 to 1. The ground levels at every 100 m along the centre lines are as under: 12 (2 :2: 1.3.1)

Distance(m)	0	100	200	300	400
R. L(m)	204.8	206.2	207.5	207.2	208.3

The formation level at zero chainage is 207 m and the embankment have a rising gradient of 1 in 100. The ground is level across the centre line. Calculate the volume of earthwork.

### Module-3

5. a. Define the following **08** (2 :3: 1.2.1)  
(i)Transiting (ii) Swinging (iii) Trunnion axis (iv) Vertical axis
- b. Explain repetition method of measuring horizontal angle in theodolite survey. **12** (2 :3: 1.2.1)

**(OR)**

6. a. Derive the expressions for the horizontal distance, vertical distance and the elevation of elevated object, when the base is inaccessible and instrument stations are in the same vertical plane with the object. **08** (2 :3: 1.2.1)
- b. In order to ascertain the elevation of the top Q of the signal on a hill, observations were made from two instrument stations P and R at a horizontal distance 100 m apart, the stations P and R being in line with Q. The angles of elevation of Q at P and R were  $28^{\circ}42'$  and  $18^{\circ}6'$  respectively. The staff readings upon the bench mark of elevation 287.28 m were respectively 2.870 and 3.750 when the instrument was at P and at R, the telescope being horizontal. Determine the elevation of the foot of the signal if the height of the signal above its base is 3 metres. **12** (2 :3: 1.3.1)

### Module-4

7. a. With a neat sketch explain different types of curves. **10** (2 :4: 1.2.1)
- b. Explain procedure to set simple circular curve using Rankine's deflection method. **10** (3 :4: 1.3.1)

**(OR)**

8. a. With neat sketch, explain various elements of a compound curve. **10** (2 :4: 1.2.1)
- b. Two straight lines AB and BC are intersected by a line EF. The angles BEF and BFE are  $40^{\circ}30'$  and  $36^{\circ}24'$  respectively. The radius of the first arc is 600 m and the second arc are 800 m. If the chainage of PI is 8248.1 m, find the chainage of the tangent points and the point of compound curvature. **10** (3 :4: 1.3.1)

### Module-5

9. a. Explain the reiteration method of measuring the horizontal angle using transit theodolite with neat tabular column. **10** (2 :5: 1.2.1)
- b. Derive an expression for relief displacement on a vertical photograph. List the characteristics of relief displacement. **10** (2 :5: 1.2.1)

**(OR)**

- 10 a. Write a note on electronic theodolite and total station. **08** (2 :5: 1.2.1)
- b. Define (i) GPS (ii) Remote Sensing (iii) Photogrammetry (iv) Overlap Explain the components of GIS. **12** (2 :5: 1.2.1)

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