

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, January 2025

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>
Module-1			
1. a.	Define surveying. Explain classification of surveying.	10	(2 :1: 1.2.1)
b.	Differentiate between plane surveying and geodetic surveying.	06	(2 :1: 1.2.1)
c.	Differentiate between plans and maps.	04	(2 :1: 1.2.1)
(OR)			
2. a.	Define the following (i) Dip (ii) Declination (iii) Bearing (iv) Meridian	04	(2 :1: 1.2.1)
b.	Differentiate between prismatic compass and surveyor compass.	08	(2 :1: 1.2.1)
c.	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 ⁰ 30'	219 ⁰ 15'
BC	100 ⁰ 45'	278 ⁰ 30'
CD	25 ⁰ 45'	207 ⁰ 15'
DE	325 ⁰ 15'	145 ⁰ 15'

Module-2

3. a.	Enter the following readings in level book and determine RL of the points. Instrument is shifted after taking 2 nd , 4 th and 8 th reading. 0.875, 1.235, 2.310, 1.385, 2.930, 3.125, 4.125, 0.120, 1.875, 2.030 and 3.765 (Note: All reading are in "m"). Assume RL of bench mark as 231m.	12	(2 :2: 1.2.1)
b.	Explain temporary adjustment of dumpy level.	08	(2 :2: 1.3.1)
(OR)			
4. a.	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: 1.2.1)

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.

- b. Explain measurement of area by using planimeter. 08 (2 :2: 1.3.1)

Module-3

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

(OR)

6. a. 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: 1.2.1)
b. 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 single plane. 08 (2 :3: 1.3.1)

Module-4

7. a. Discuss the elements of a simple curve with a neat sketch. 10 (2 :4: 1.2.1)
b. Enumerate the procedure to set simple circular curve using Rankine's deflection method. 10 (3 :4: 1.3.1)

(OR)

8. a. 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 (2 :4: 1.2.1)
b. With neat sketch, explain various elements of a compound curve. 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. Bring out 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 GPS, Remote Sensing, Photogrammetry and overlap. Explain the components of GIS. 12 (2 :5: 1.2.1)

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