

**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, March/April 2023

**GEODETIC ENGINEERING**

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>
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**MODULE – 1**

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|----|---|-----------|---------------|
| 1. | a. What is Surveying? Explain the basic principles of surveying with neat sketches. | <b>08</b> | (2 :1: 1.4.1) |
|    | b. Differentiate between plan and map.  | <b>02</b> | (2 :1: 1.2.1) |
|    | c. Give the broad classification of surveying.                                      | <b>10</b> | (1 :1: 1.2.1) |

**OR**

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|----|---|-----------|---------------|
| 2. | a. Differentiate between Prismatic Compass and Surveyors Compass.     | <b>08</b> | (2 :1: 1.3.1) |
|    | b. The following bearings were observed in running a closed traverse. | <b>12</b> | (3 :1: 2.2.4) |

Line	F. B	B. B
AB	75°5'	254°20'
BC	115°20'	296°35'
CD	165°35'	345°35'
DE	224°50'	44°5'
EA	304°50'	125°5'

At what stations do you suspect the local attraction? Determine the correct magnetic bearings. If declination was 5°10'E, what are the true bearings?

**MODULE – 2**

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|----|--|-----------|---------------|
| 3. | a. Explain the temporary adjustments of a dumpy level.   | <b>10</b> | (2 :2: 1.4.1) |
|    | b. The following staff readings were observed successively with a level, the instrument having been moved after 3 <sup>rd</sup> , 6 <sup>th</sup> and 8 <sup>th</sup> readings 2.228; 1.606; 0.988; 2.090; 2.864; 1.262; 0.602; 1.982; 1.044; 2.684 metres. Enter the above readings in a page of a level book and calculate the R.L of points if the first reading was taken with a staff held on a B.M of 432.384 m. | <b>10</b> | (3 :2: 2.2.4) |

**OR**

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|----|---|-----------|---------------|
| 4. | a. What are the characteristics of contour? Explain with sketches.  | <b>08</b> | (1 :2: 1.4.1) |
|    | 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: | <b>12</b> | (3 :2: 2.2.4) |

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

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

### MODULE – 3

5. a. List the applications of theodolite. 04 (1 :3: 1.3.1)  
b. Explain the repetition method of measuring the horizontal angle using transit theodolite with neat tabular column. 12 (2 :3: 1.4.1)  
c. Define the following terms with respect to theodolite: 04 (1 :3: 1.3.1)  
Centring; Transiting; Swing; Vertical Axis:

**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 not in the same vertical plane with the object. 12 (3 :3: 1.3.1)  
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. 08 (3 :3: 2.2.4)

### MODULE – 4

7. a. List the different methods of setting out simple circular curve. Explain the linear method of setting out simple curve by the method of offset from chord produced. 10 (2 :4: 1.3.1)  
b. Calculate the ordinates at 7.5 m interval for a circular curve given that the length of long chord is 60 m, radius 180 m and prepare the curve table. 10 (3 :4: 2.2.4)

**OR**

8. a. With neat sketch, explain various elements of a compound curve. 06 (2 :4: 1.4.1)  
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 is 800 m. If the chainage of PI is 8248.1 m, find the chainage of the tangent points and the point of compound curvature. 14 (3 :4: 2.2.4)

### MODULE – 5

9. a. Derive an expression for relief displacement on a vertical photograph. List the characteristics of relief displacement. 10 (3 :5: 1.3.1)  
b. Explain the procedure to find true difference in elevation between two points situated far apart by using reciprocal levelling. 10 (2 :5: 1.4.1)

**OR**

10. a. Explain the components of GIS with neat figure. 08 (2 :5: 1.4.1)  
b. The scale of an aerial photograph is 1cm = 100 m. The photograph size is 20 cm X 20 cm. Determine the number of photographs required to cover an area of 150 sqkm. If the longitudinal lap is 60% and the side lap is 30%. 08 (3 :5: 2.2.4)  
c. What is Remote sensing? Explain the classification of remote sensing. 04 (2 :5: 1.4.1)

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