

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN

--	--	--	--	--	--	--	--	--	--

Course Code

2	2	C	V	3	2
---	---	---	---	---	---

Third Semester B.E. Degree Examinations, March/April 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>															
<u>Module-1</u>																		
1.	a. What is surveying? Explain the basic principles of surveying with neat sketches.	10	(1 :1: 1.2.1)															
	b. Differentiate between plane survey and geodetic survey.	04	(1 :1: 1.2.1)															
	c. The length of the line measurement with a 20 m chain was found to be 650.50 m. It was afterwards found that the chain 0.1 m too long. Find the true length of the line.	06	(1 :2: 2.1.1)															
(OR)																		
2.	a. Differentiate between prismatic compass and surveyor's compass.	06	(1 :1: 1.2.1)															
	b. Write a note on local attraction, list the elimination of local attraction in compass surveying.	04	(1 :1: 1.2.1)															
	c. The following bearings were observed in a compass traverse. Determine the stations affected by local attraction apply correction and find the corrected bearings.	10	(1 :2: 2.1.1)															
<table><tr><td>Line</td><td>F.B.</td><td>B.B</td></tr><tr><td>AB</td><td>S 45⁰30' E</td><td>N 45⁰ 30' W</td></tr><tr><td>BC</td><td>S 60⁰ 00' E</td><td>N 60⁰ 40' W</td></tr><tr><td>CD</td><td>N 5⁰ 30' E</td><td>S 3⁰ 20' W</td></tr><tr><td>DA</td><td>N 54⁰ 30' W</td><td>S 56⁰ 00' E</td></tr></table>				Line	F.B.	B.B	AB	S 45 ⁰ 30' E	N 45 ⁰ 30' W	BC	S 60 ⁰ 00' E	N 60 ⁰ 40' W	CD	N 5 ⁰ 30' E	S 3 ⁰ 20' W	DA	N 54 ⁰ 30' W	S 56 ⁰ 00' E
Line	F.B.	B.B																
AB	S 45 ⁰ 30' E	N 45 ⁰ 30' W																
BC	S 60 ⁰ 00' E	N 60 ⁰ 40' W																
CD	N 5 ⁰ 30' E	S 3 ⁰ 20' W																
DA	N 54 ⁰ 30' W	S 56 ⁰ 00' E																
<u>Module-2</u>																		
3.	a. Explain reciprocal levelling with neat procedure.	10	(1 :2: 1.2.1)															
	b. What is bench mark? Explain the types of bench marks.	08	(1 :2: 1.2.1)															
	c. List the methods to determine the area enclosed between survey line and an irregular boundary line.	02	(1 :2: 1.2.1)															
(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: 2.1.1)															
<table><tr><td>Distance</td><td>0</td><td>100</td><td>200</td><td>300</td><td>400</td></tr><tr><td>R. L</td><td>204.8</td><td>206.2</td><td>207.5</td><td>207.2</td><td>208.3</td></tr></table> <p>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.</p>				Distance	0	100	200	300	400	R. L	204.8	206.2	207.5	207.2	208.3			
Distance	0	100	200	300	400													
R. L	204.8	206.2	207.5	207.2	208.3													
	b. Explain the temporary adjustments of a dumpy level.	08	(1 :2: 1.2.1)															

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PI- Performance Indicator)

Module-3

5. a. Explain the repetition method of measuring the horizontal angle using transit theodolite with neat tabular column **10** (1 :3: 1.2.1)
- b. Define the following terms with respect to theodolite: **04** (1 :3: 1.2.1)
(i) Centering (ii) Transiting (iii) Swing (iv) Vertical Axis
- c. An instrument was set up at P and the angle of elevation to a vane 4 m above the foot of the staff held at Q was $90^{\circ} 30'$. The distance between horizontal between P and Q was known to be 2000 m. determine the R.L of the staff station Q, given that the R.L of the instrument axis was 2650.38 m. **06** (2 :3: 2.1.1)

(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. **14** (2 :3: 1.2.1)
- b. Enumerate the applications of transit theodolite. **06** (1 :3: 1.2.1)

Module-4

7. a. With neat sketch, explain various elements of a simple curve **10** (1 :4: 1.2.1)
- b. Two straights intersect at chainage 2056.44 m and the angle of intersection is 130 degree. If the radius of the simple curve to be introduced is 50 m, set out the curve by offsets from long chord for 5m interval. find the following: **10** (2 :4: 2.1.1)
(i) Chainage of the point of curve.
(ii) Chainage at point of tangency.
(iii) Length of the long chord.

(OR)

8. a. Two straights intersect at a chainage of 1764 m and at a deflection angle of 32° . They are to smoothly join by a 5° curve. Taking the peg interval at 30 m work out the data required to set out the curve by the deflection angle method. Least count of the theodolite is $20'$. Take length of chain = 30 m. **12** (2:4: 2.1.1)
- b. Derive the relationship between degree of curve and radius of curve with neat figure. **08** (1 :4: 1.2.1)

Module-5

9. a. The scale of an aerial photography is 1cm =100 m. The photograph size is 20 cm \times 20 cm. Determine the number of photographs required to cover an area 08 km \times 12.5 km, If the longitudinal lap is 60 % and the side lap is 30 %. **08** (2:5: 2.1.1)
- b. Explain idealized remote sensing system with neat figure. **12** (1 :5: 1.2.1)
- (OR)**
- 10 a. Derive an expression for relief displacement on a vertical photograph. List the characteristics of relief displacement **12** (2:5: 1.2.1)
- b. Define the following terms: **04** (1 :5: 1.2.1)
(i) Flying height (ii) Principal axis (iii) Exposure Station (iv) Oblique photograph.
- c. List the reasons to keep the overlap in the aerial photographs. **04** (1 :5: 1.2.1)

*** ** *