

Vellore Institute of Technology
 (Deemed to be University under section 3 of UGC Act, 1956)
SCHOOL OF CIVIL ENGINEERING
CONTINUOUS ASSESSMENT TEST - I
FALL SEMESTER 2025-2026

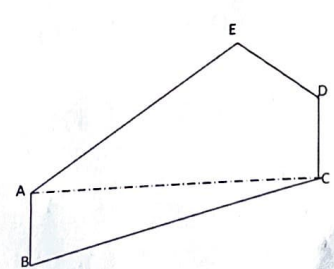
Programme Name & Branch: B. Tech Civil Engineering
Course Code: BCLE204L
Course Name: Surveying
Faculty Name(s): Dr. P. Porchelvan, Dr. N. Vaani
Class Number(s): VL2025260101162; VL2025260101163
Date of Examination: 17.08.2025
Exam Duration: 90 minutes

Maximum Marks: 50

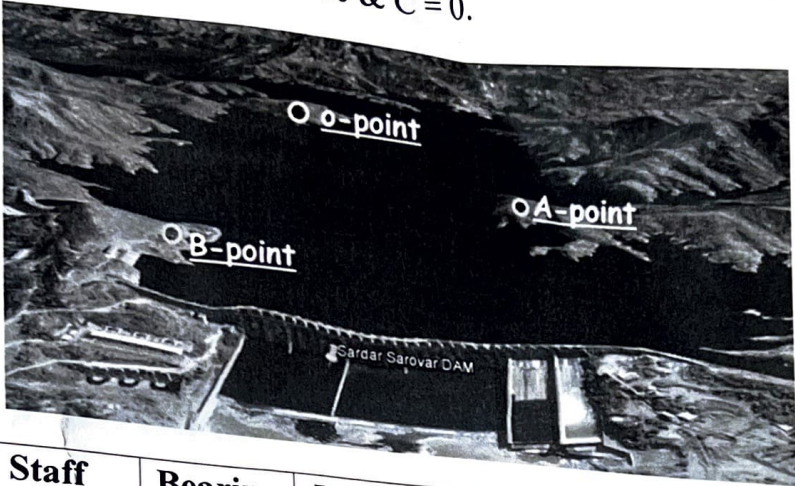
General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level
(1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- **Course Outcome Statements:**

CO 1: Perform surveying using different types of surveying instruments and equipment such as levels, theodolite, Total station, GPS and LIDAR.
 CO 2: Measure distances, angles, elevations and coordinates.
 CO 3: Estimate the area of given parcel of land and calculate the volume of earthwork involved in cutting and fillings.

Q. No	Question	M	CO	BL
1.	In order to survey an irregular plot of land, ABCDEA as shown in Fig.1, using a simple cross-staff and a measuring tape, the survey team has decided to set up a baseline, AC that runs through the interior of the plot. The offsets were measured from this baseline to the vertices B on one side and D and E on the other side.  Fig. 1 The field book contains the following measurements: 1. The length of the baseline AC=150 m 2. Offset from A to B=45 m (measured perpendicular to AC) 3. Offset from C to D=60 m perpendicular to AC) However, by mistake, the survey crew forgot to measure the offset from the baseline AC to vertex E. They did, however, record the following additional information. Total area of the plot ABCDEA= 13,875 m²	10	3	3

Q. No	Question	M	CO	BL												
	Distance from A to the foot of the offset for E= 100 m With the recorded details in the survey, calculate the missing offset from the baseline AC to vertex E.															
2.	The following bearings were observed with a compass in a closed traverse. Determine the interior angles. <table><tr><th>Line</th><th>Fore Bearing</th></tr><tr><td>AB</td><td>60°30'</td></tr><tr><td>BC</td><td>122°0'</td></tr><tr><td>CD</td><td>46°0'</td></tr><tr><td>DE</td><td>205°30'</td></tr><tr><td>EA</td><td>300°0'</td></tr></table>	Line	Fore Bearing	AB	60°30'	BC	122°0'	CD	46°0'	DE	205°30'	EA	300°0'	10	2	3
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3.	A closed traverse is to be conducted for a new land parcel of an irregular polygon shape (A, B, C, D, E, F). You have been provided with a conventional theodolite, a measuring tape, and a set of ranging rods. Describe the step-by-step field procedure for executing this closed traverse, from the initial reconnaissance to the final measurement at the closing station. Include a discussion of the instruments' proper setup and the data you would record in your field book along with the measures to minimize the errors in your observation.	10	1	2												
4.	The following consecutive readings were taken with a level and 5 m levelling staff on a continuously sloping ground at a common interval of 20 m. 0.420, 1.115, 2.265, 2.900, 3.615, 0.535, 1.470, 2.815, 3.505, 4.445, 0.605, 1.925, 2.885. The first target station has an elevation of 155.272 m. Rule out a page of level book and enter the readings. Calculate (i) the reduced levels of all the points and (ii) the gradient of the line joining the first and last points.	10	2	4												

Q. No	Question	M	CO	BL																					
5.	Surveyor has gone for survey at a dam site of Sardar Sarovar Dam. He wants to know distance between A and B point and slope between them. So, he set his tacheometer at point O and took readings with staff held vertical. The observations are given below. Find the distance and slope between A and B. Take instrument constants, $K=100$ & $C=0$.  <table><thead><tr><th rowspan="2">Staff Point</th><th rowspan="2">Bearing (WCB)</th><th rowspan="2">Vertical Angle</th><th colspan="3">Staff Reading (m)</th></tr><tr><th>Top</th><th>Mid</th><th>Bottom</th></tr></thead><tbody><tr><td>A</td><td>90°</td><td>30°</td><td>2.500</td><td>2.000</td><td>1.500</td></tr><tr><td>B</td><td>180°</td><td>10°</td><td>0.600</td><td>1.000</td><td>1.200</td></tr></tbody></table>	Staff Point	Bearing (WCB)	Vertical Angle	Staff Reading (m)			Top	Mid	Bottom	A	90°	30°	2.500	2.000	1.500	B	180°	10°	0.600	1.000	1.200	10	1	3
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