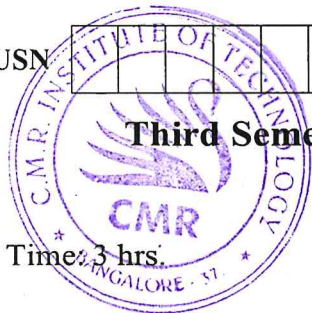


CBCS SCHEME

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17CV34



Third Semester B.E. Degree Examination, July/August 2021

Basic Surveying

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

- What is surveying? Explain the principles of surveying. (08 Marks)
 - Differentiate between Plan and Map. (02 Marks)
 - Give the broad classification of surveying. (10 Marks)
- What are the different types of chain used in surveying? (04 Marks)
 - A 30m chain was found to be 5 cm too long after chaining 100 chains and after chaining 180 chains the chain was found to be 10 cm too long what is the true distance chained. It was correct before commencement of work. (06 Marks)
 - There is an obstacle in the form of pond on main line AB. Two points C and D were taken on the opposite side of a pond. On the left of CD, a line CE was laid out 120m in length and a second line CF 80 m was laid on the right of CD. Such that E, C and F are in line. Determine the obstructed length CD. Given ED = 180m and DF = 165m. (10 Marks)
- Differentiate between Prismatic compass and Surveyors compass. (05 Marks)
 - Calculate the bearing of sides of a regular pentagon of sides 4m. Traversed in anticlockwise direction. Bearing of AB = 85°. Draw a rough figure. (05 Marks)
 - In a closed compass traverse the following whole circle bearing were observed, where local attraction was suspected. Compute the correct bearing of the lines. Also T.B. if declination is 2°E. [Refer Table Q3(b)]

Line	Fore bearing	Back bearing
AB	74° 20'	256° 0'
BC	107° 20'	286° 20'
CD	224° 50'	44° 50'
DA	306° 40'	126° 0'

Table Q3(b)

(10 Marks)

- Explain the measurement of horizontal angle by method of repetition with tabular format. Mention the errors eliminated. (10 Marks)
 - Explain the term: (i) Swinging (ii) Plunging (iii) Line of collimation (iv) Trunion axis. (04 Marks)
 - Explain the temporary adjustment of theodolite. (06 Marks)

- Following data available for closed traverse ABCDEA. Using Bowditch rule compute the co-ordinate of all station. Taking coordinate of A(400, 400). Refer Table Q.5(a). (16 Marks)

Table Q.5(a)

Line	Length	Bearing
AB	130 m	92° 0'
BC	158 m	174° 0'
CD	145 m	220° 0'
DE	308 m	279° 0'
EA	337 m	48° 0'

- What is closing error? What are the methods of adjustment? (04 Marks)

- 6 a. Derive the expression for distance and elevation when the staff is vertical and line of sight is inclined. (10 Marks)
 b. Determine the gradient from a point A to B from the following observations made with tacheometer fitted with analectic lens. Take $k = 100$ and staff held vertical.

Inst. Station	Staff Station	Bearing	Vert. Angle	Staff reading
P	A	134°	+10° 32'	1.360, 1.915, 2.490
	B	224°	+5° 6'	1.065, 1.885, 2.705

(10 Marks)

- 7 a. What are the temporary adjustments of Dumpy level? (06 Marks)
 b. Define : (i) MSL (ii) B.M. (iii) R.L. (iv) B.S. (04 Marks)
 c. Following observations were taken in reciprocal leveling:

Inst. at	Staff reading on		Remarks
	A	B	
A	1.545 m	2.565 m	Dist. AB = 1420 m
B	0.725 m	1.935 m	RL of A = 108.360 m

- (i) Find the RL of B (True RL) (ii) Collimation error. (10 Marks)

- 8 a. What are the classification of leveling? Explain any four in brief. (10 Marks)
 b. The following observations were made on a hill top to ascertain its elevation. The height of target F was 5m. The instruments were 100m apart and were in line with F.

Inst. Station	Staff reading on B.M.	Ver. Angle	Remarks.
O ₁	2.550	18° 6'	R.L of
O ₂	1.670	28° 42'	BM = 345.580

(10 Marks)

- 9 a. What is Zero Circle? Find the area of zero circle from the following observations. Take $m = 100 \text{ cm}^2$.
 (i) Anchor point outside the figure I.R = 8.436 F.R = 4.325 The zero of the disc passed the index mark once in clockwise direction.
 (ii) Anchor point inside the figure I.R = 2.844 F.R = 5.434 The zero of the dist passed the index mark twice in anti-clockwise direction. (10 Marks)
 b. The railway embankment 500m long has a width at formation level of 9m with side slopes of 2 to 1. The ground level at every 100m along the centre line are.

Distance in m	0	100	200	300	400	500
Ground level in m	107.8	106.3	110.5	111.0	110.7	112.2

The embankment has arising grad. of 1.2m per 100m and the formation level is 110.50m at zero chainage. Compute the volume of E/W by Trapezoidal rule and Prismoidal rule.

(10 Marks)

- 10 a. What is Simpson's rule? Derive the expression for it. (08 Marks)
 b. What is contour? What are the characteristics of contour? (06 Marks)
 c. Plot the cross staff survey of field ABCDEFG and calculate its area. [Refer Fig.Q10(c)].

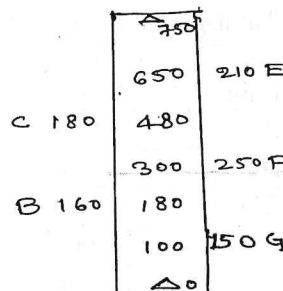


Fig.Q10(c)

(06 Marks)