Government College of Engineering, Amravati

(An Autonomous Institute of Government of Maharashtra)

Fourth B. Tech. (Civil Engineering)

Summer – 2018

Course Name: Surveying

Course Code: CEU 403

Time: 2 hr.30min. **Max. Marks: 60**

Instructions to Candidate

1) All questions are compulsory.
2) Assume suitable data wherever necessary and clearly state the assumptions made.
3) Diagrams/sketches should be given wherever necessary.
4) Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5) Figures to the right indicate full marks.

1.	**(a)**	Define Surveying. Enlist the types of Surveying.	**2**
	(b)	State the Principle of surveying. Why not "Part to Whole"? Explain.	**5**
	(c)	Explain different corrections that can be applied to chain or tape.	**5**
2.	**(a)**	A rectangular plot was measured with a 20m tape which was 12cm too long. The area obtained was 125200 sq.m. Find the true area of the plot.	**3**
	(b)	Following are the bearings taken on a closed compass traverse.	**9**

Contd

Line	Fore Bearing	Back Bearing
AB	80°10'	259°00'
BC	120°20'	310°50'
CD	170°50'	350°50'
DE	230°10'	49°30'
EA	310°20'	130°15'

Compute the interior angles and correct the observational errors. Assuming the bearing of line CD to be correct, adjust the bearing of the remaining lines.

OR

(b) Give the statement of two point problem in plane table surveying. How it can be solved? 9

3. (a) The following readings were observed successively with a levelling instrument. The instrument was shifted after 5th and 11th readings. Draw a page of level book and determine the R.L. of various points by H.I. method if the R.L. of 1st point was 264.350m. 9

0.485, 1.020, 1.787, 3.395, 3.875, 0.360, 1.305, 1.785, 2.675, 3.385, 3.885, 1.835, 0.435 and 1.705.

OR

(a) Insert the missing entries and record filed book by rise and fall method. Apply usual checks. 9

BS	IS	FS	HI	RL	Remark
X			297.080	277.650	OBM
	2.010			X	
	X			278.070	
3.370		0.400	X	278.680	
	2.980			X	
	1.410			280.640	
		X		281.370	TBM

(b) Define leveling. 3

4 (a) The following offsets were taken from a chain line to a hedge. 7

Distance in m	0	6	12	18	36	48	60
Offsets in m	6	9	10	12	13	9	5

Calculate the area using (i) Simpson's rule (ii) trapezoidal rule.

(b) Define the following; 5
i) Parallax ii) Bench Mark
iii) Contour gradient iv) Height of Instrument
v) Lead

5. (a) The following readings were taken on a vertical staff with a tacheometer fitted with an analytic lens and having a constant of 100. 6

Staff station	Bearing	Staff readings			Vertical angles
A	47°10'	0.940	1.500	2.060	8°0'
B	227°10'	0.847	2.000	3.153	-5°0'

Calculate the relative level of the ground at A and B and the gradient between A and B.

(b) What is tacheometric survey? List out the different methods of tacheometry. 3

(c) Define Transiting. What are face left and face right observations? 3

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Fourth Semester B. Tech. (Civil Engineering)

Summer – 2016

Course Code: CEU403 **Course Name: Surveying**

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Instructions to Candidate

1) All questions are compulsory.
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1. **(a)** Explain in detail chaining on sloping ground. Differentiate between Plane and Geodetic surveying. Draw the conventional symbols for road in cutting and triangulation station. **06**

(b) Explain with the help of neat sketches when Chaining is free & vision is obstructed. Explain the procedure of applying corrections for measurements by tape for absolute length, temperature and tension. **06**

OR

Define traverse surveying? Explain the procedure of calculation of included angles from bearings. Define the term closing error in a closed traverse? Explain, How would you adjust it graphically?

Contd...

2. (a) The following bearings were observed while traversing with a compass. Mention which stations are affected by local attraction. Determine the corrected bearings for local attraction and for declination of 2° 45′ W. **06**

Line	Fore Bearing	Back Bearing
AB	80° 45′	260° 00′
BC	130° 30′	311° 35′
CD	240° 15′	60° 15′
DA	290° 30′	110° 10′

(b) Explain the procedure of an orientation of plane table by Back sighting method. Explain with the help of neat sketches the radiation and Resection method of plane tabling. **06**

OR

State the advantages and disadvantages of plane tabling. What is Two-Point problem in plane tabling? How is it solved?

3. (a) Define the terms (i) Datum Surface (ii) Parallax, (iii) Axis of the telescope, (iv) Change Point. What are the different errors and mistakes in leveling? **06**

OR

Explain in detail the process of profile leveling. What are the effects of the earth's curvature and the atmospheric refraction in leveling?

(b) In running fly levels from bench mark of R.L. 440.50, the following readings were obtained: **06**

Back Sight: 0.985, 1.655, 1.125, 0.875, 0.410.
Fore Sight: 0.975, 1.285, 2.055, 1.215.
From the last position of the instrument, seven pegs at 10 m intervals are to be set out on a uniform gradient of 1 in 40. The RL of first peg is 439.60. Calculate the staff readings required for setting the tops of the pegs on the given gradient and enter the results in a level field book.

4. (a) Define the terms: - (i) Transiting, (ii) Telescope normal, (iii) Contour, & (iv) Horizontal Equivalent. Explain the various indirect methods of contouring with the help of neat sketches. (

(b) Explain the detailed procedure of measurement of Horizontal angle by Repetition method and Lining in by theodolite. 0

5. (a) Describe the detailed procedure of measurement of Magnetic bearing of a line and balancing in by theodolite. 0

(b) Draw a neat sketch of a Digital Planimeter showing its all parts. State the different components of Total Station. Explain how you would measure the length of a line and Horizontal angle by a Total Station. 0(

Government College of Engineering, Amravati

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Fourth Semester B. Tech. (Civil Engineering)

Summer – 2017

Course Code: CEU403

Course Name: SURVEYING

Time: 2 hr.30min. **Max. Marks: 60**

Instructions to Candidate

1) All questions are compulsory.
2) Assume suitable data wherever necessary and clearly state the assumptions made.
3) Diagrams/sketches should be given wherever necessary.
4) Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5) Figures to the right indicate full marks.

1. (a) Explain the classification of surveying on the basis of accuracy desired, purpose, place of survey. Explain in detail Indirect Ranging. 06

(b) Explain the principles of Surveying. Explain with the help of neat sketches when Chaining is obstructed & vision is free. 06

OR

State the different components of Prismatic compass and write the use of them with the help of neat sketch. Explain in detail the Local attraction.

2. (a) The following bearings were observed while 06

traversing with a compass. Determine the corrected fore & back bearings and the true bearings of the lines for magnetic declination is 2° 15′ E.

Line	Fore Bearing	Back Bearing
AB	66° 15′	244° 00′
BC	129° 45′	313° 00′
CD	218° 30′	37° 30′
DA	306° 45′	126° 45′

(b) Explain the procedure of Orientation by Back sighting method. Explain with help of neat sketches the intersection & resection method of plane tabling. 06

OR

Write the use of different accessories of plane table surveying. What is meant by the Three-Point problem in plane tabling? Explain how is it solved by graphical method?

3 (a) Explain the different types of Bench Marks. Explain in detail the different leveling difficulties. 06

OR

Differentiate between the Height of collimation method and Rise & Fall method of reduction of levels. Describe the procedure of booking of field readings in the field book.

(b) The following consecutive readings were taken 06

with a level and 4m staff on continuously sloping ground at a common interval of 30m.

0.945; 1.725; 1.995; 2.750; 3.055; 3.790; 1.115; 1.965; 2.455; 3.715; 0.985; 1.375; 1.865; and 2.615 meters.

Enter the above readings in a page of a level book & calculate the R.L. of points, if the first reading was taken with a staff held on a benchmark of 440.60 m. Also calculate the gradient of the line joining the first and last points.

4 (a) Define the terms: - (i) Transiting, (ii) Swinging, (iii) Telescope inverted, (iv) Contour Interval, & (v) Horizontal Equivalent. Explain what are the different characteristics of contour lines with help of neat sketches. 06

(b) Explain the detailed procedure of measurement of Deflection Angle and Vertical Angle by theodolite. 06

5 (a) Describe the detailed procedure of measurement of Magnetic bearings of a line and Laying off a horizontal angle by theodolite. 06

(b) Explain the detailed procedure of measurement of the area of a given figure by Digital Planimeter. 06
State the different uses of Total Station. Explain how you would measure the horizontal angle and sloping distance by a Total Station.

Government College of Engineering, Amravati

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IV Semester B. Tech. (Civil Engg.)

Summer- 2010

Course Code : CE405

Course Name : Surveying - I

Time : 2 hr. 30min. Max. Marks : 60

Instructions to Candidate

1) All questions are compulsory.
2) Assume suitable data wherever necessary and clearly state the assumptions made.
3) Diagrams/sketches should be given wherever necessary.
4) Use of logarithmic table, drawing instruments and non-programmable calculators is permitted.
5) Figures to the right indicate full marks.

1. **Attempt any two of following** 12

(a) Explain with the help of neat sketch how the field details along a survey line are noted a field book during chain and compass surveying.

(b) What is meant by closing error in a closed traverse? Explain how you would adjust it graphically?

(c) The following bearings were observed on a closed compass traverse ABCDE. Compute the interior angles of the traverse and correct them for observational errors.

Line	F.B.	B.B
AB	191° 15'	10° 15'
BC	120° 45'	300° 45'
CD	349° 5'	169° 00'
DE	339° 35'	160° 40'
EA	296° 00'	115° 00'

Q.2 **Attempt any two of following** 12

(a) The following consecutive readings were taken with a level and 4 m staff on a continuously sloping ground at a common interval of 30 m.
0.780, 1.535, 1.955, 2.430, 2.985, 3.480, 1.155, 1.960, 2.365, 3.640, 0.935, 1.045, 1.630 and 2.545.
The reduced level of the first point was 180.750. Rule out a page of a level field book and enter the above readings. Calculate the reduced levels of the points and find the gradient of the line joining the first and last point.

(b) What is meant by Bench Mark? Explain the different types of Bench Marks.

(c) Draw a neat sketch (section) of a internal focusing telescope of a level/theodolite and explain its components.

Q.3 **Attempt any two of following** 12

(a) Describe the characteristics of contours with suitable sketches. Explain the uses of contour maps.

(b) Describe with suitable sketches the various indirect methods of contouring.

(c) What is meant by profile leveling? Describe with

suitable sketches the process of profile leveling.

Q.4 **Attempt any two of following** 12

(a) Explain with the suitable sketches the radiation and intersection method of Plane Tabling.

(b) Explain briefly how you would set up and orient the plane table at a station.

(c) Draw a neat sketch of a digital Planimeter showing its parts. Explain how you would use it to find the area of a given figure.

Q.5 **Attempt any two of following** 12

(a) Explain the temporary adjustments of a transit theodolite.

(b) Explain how you would measure the horizontal & vertical angle by a theodolite. Give the formats to enter the readings.

(c) Explain how you would measure the length and magnetic bearing of a line by a Total Station.

CT1 **Surveying CEU403** Date 24.1.2017 Time 12.00 to 1.00 pm

Q1. Explain direct and indirect ranging (03M)

Q2. What are the different methods of chaining on sloping ground? Explain any two (04M)

Q3. Calculate the reduced bearings of following whole circle bearings (03M)

WCB $=20^0\ 15'$

WCB$= 45^0\ 45'$

WCB$= 180^0\ 30'$

WCB$= 191^0\ 30'$

WCB$=215^0\ 15'$

WCB$=115^0\ 0'$

Q4. Calculate the back bearings of following fore bearings (03M)

FB of line AB $= 65^0\ 30'$

FB of line BC $= 145^0\ 15'$

FB of line CD $= 180^0\ 0'$

FB of line DE $= 190^0\ 15'$

FB of line EF $= 265^0\ 15'$

FB of line FG $= 345^0\ 45'$

FB of line GH $= 20^0\ 0'$

FB of line HI $= 345^0\ 15'$

FB of line IA $= 85^0\ 45'$

Q5. Calculate Magnetic bearing of the line AB if the true bearing is $315^0\ 15'$ and magnetic declination is 10^0 east. (02M)

OR

Q6. The surveyor measured the length of line with 20 m chain and it is found to be 300m after wards it is found that the chain was 2m too small then what is the actual length of line? (02M)