Government College of Engineering, Amravati

(An Autonomous Institute of Government of Maharashtra)

Fourth Semester B. Tech. (Civil Engineering)

Summer – 2016

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 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(

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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.