

4E4114

Roll No. _____

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B. Tech. IV-Sem. (Main & Back) Exam; April-May 2017

Civil Engineering
4CE4A Surveying - I

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 26

Instructions to Candidates :-

Attempt any **five** questions, selecting **one** question from each unit. All Questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used / calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL2. NIL**UNIT - I**

1 Differentiate between the following terms :

- Chainage and offset
- Base line and check line
- Main station and tie station
- Cumulative and Compensating error.

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OR

1 (a) Define surveying. What are the principles of surveying ? Explain them.

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[P.T.O.

- (b) A line was measured with a steel tap which was exactly 30 m at a temperature of 20°C and a pull of 10 kg. The measured length was 1650 m. The temperature during measurement was 30°C and the pull applied was 15 kg. Find the true length of line, if cross-sectional area of tap was 0.025 cm². The coefficient of expansion is $3.5 \times 10^{-6} / ^\circ\text{C}$ and modulus of elasticity $E = 2.1 \times 10^6 \text{ kg/cm}^2$.

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UNIT - II

- 2 (a) Given below are the bearings observed in a traverse survey conducted with a prismatic compass at a place where local attraction was suspected :

<i>Line</i>	<i>Fore bearing</i>	<i>Back bearing</i>
AB	124° 30'	304° 30'
BC	68° 15'	246° 00'
CD	310° 30'	135° 15'
DA	200° 15'	17° 45'

At what stations do you suspect local attraction. Find the correct bearings of the lines and the included angles.

- (b) Define : True meridian, magnetic meridian, angle of dip, local attraction and angle of magnetic declination.

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OR

- 2 (a) Does local attraction at a point affect the magnitude of an angle computed from magnetic bearing read at that point. Explain.
- (b) Find out the bearing of the lines of an equilateral triangle ABC running clockwise if the bearing of the line AB is 60° 30'.

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UNIT - III

- 3 (a) Enlist the source of errors in a theodolite traverse survey. How is the closing error of a traverse adjusted graphically ?
- (b) What is meant by balancing a traverse ? State various rules used to do this.

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OR

- 3 (a) What do you mean by latitude and departure ? State the checks to be applied in case of closed and open traverse.
- (b) The bearings of two inaccessible stations A and B taken from a station C were $250^{\circ} 00'$ and $153^{\circ} 26'$ respectively. The co-ordinates of A and B were as follows :

<i>Station</i>	<i>Easting</i>	<i>Northing</i>
A	300 m	200 m
B	400 m	150 m

Calculate the independent co-ordinates of 'C'.

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UNIT - IV

- 4 Differentiate between the following pairs :
- (a) Back sight and fore sight
- (b) Line of collimation and axis of telescope
- (c) Profile levelling and cross-sectioning.
- (d) Curvature and Refraction correction.

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OR

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[P.T.O.

- 4 (a) Explain how the procedure of reciprocal levelling eliminates the effect of refraction and curvature as well as the error of collimation.
- (b) The reduced level of ground at four points A, B, C and D are 54.35, 54.30, 54.20, 54.30 m respectively. A sewer is to be laid so that its invert is 3.048 m below the ground at A and it falls with uniform gradient of 1 in 340 to D. The distances AB, AC and AD are 35.845 m, 80.742 m and 134.7 m respectively. Find the invert level and depth of trench at B, C and D.
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UNIT - V

- 5 (a) Define a contour. State the various characteristics of contour lines.
- (b) Discuss in detail, the methods of direct and indirect contouring.

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OR

- 5 Describe concisely the components of a plane table outfit. Explain how would you set up and orient the plane table. State the errors in plane tabling. Describe with sketches, the methods of plane table surveying.

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