4E4114

Roll No. _____ Total No. of Pages : 4

4E4114

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. NIL 2. NIL

UNIT - I

1 Differentiate between the following terms :

(a) Chainage and offset

(b) Base line and check line

(c) Main station and tie station

(d) Cumulative and Compensating error. **16**

OR

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

(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 cm^2. The coefficient of expansion is 3.5×10^{-6} / °C and modulus of elasticity E = 2.1×10^6 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 :

Line	*Fore bearing*	*Back bearing*
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 beaning 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° 00' and 153° 26' respectively. The co-ordinates of A and B were as follows :

Station	*Easting*	*Northing*
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

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. **16**

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. **16**

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. **16**

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