4E 2035

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B. Tech. IV Semester (Main/Back) Examination 2012

Civil Engineering

4CE4 Surveying - I

Time : 3 Hours

Maximum Marks : 80

Min Passing Marks : 24

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 may suitably be assumed and stated clearly.) Units of quantities used/ calculated must be stated clearly.

Unit - I

1. a) Explain following terms-   (4×2=8)

    i)   First principle of surveying.

    ii) Representative fraction.

    iii) Construction of diagonal scale.

    iv) Use of chord scale.

    b) A tape of designated length 30m was used to measure a line AB by suspending it between supports. If the measured length was 29.855m when the slope angle was $2°15'$, and the mean temperature and tension applied were respectively $17°c$ and 120N. Determine the correct horizontal length of the line if the standard length of the tape on horizontal ground was 30.015m at $27°c$ and 75N tension. The tape weighed 0.20 N/m and had a cross-sectional area of 2.5 mm². E = $2.1×10^5$ N/mm² and $\alpha = 1.15×10^{-5}/°C$.   **(8)**

Or

1. a) Draw conventional symbols of the following and mention the colours used in the symbol-

    i)   Temple, church, mosque.

    ii) Earthen embankment, cutting.

    iii) Lake, pond.

    iv) Rail-road level crossing.   (4x2=8)

b) What are different types of errors? Illustrate your answer for the case of linear measurements with a tape. **(8)**

Unit - II

2. a) Define following :- **(8)**

   i) True meridian.

   ii) Whole circle bearing.

   iii) Local attraction.

   iv) Magnetic declination. **(4x2=8)**

   b) Draw neat and clean enumerated sketch of a transit theodolite mentioning its principle axes and component parts. **(8)**

Or

2. a) Explain the method of permanent adjustment of axis of plate level of a transit theodolite. **(8)**

   b) Draw neat and clean sketch of a prismatic compass mentioning its component part. Also explain its working and use in surveying. **(8)**

Unit - III

3. a) Explain the method of adjusting a chain traverse by Boarditch's graphical method. Draw suitable sketches wherever required. **(8)**

   b) Observed bearings of a closed compass traverse are as under. Compute correct included angles and bearings of the traverse.

Line	Fore bearing	Back bearing
AB	150° 30'	329° 45'
BC	78° 00'	256° 30'
CD	42° 30'	223° 45'
DE	315° 45'	134° 15'
EA	220° 15'	40° 15'

Or

3. a) In a closed theodolite traverse ABCDEA running anticlockwise, the whole circle bearing of line AB is 55° 40' 35". The included angles and length of sides are as given under :-

Line	Length	Angle	Magnitude
AB	137.5m	A	115° 15' 25"
BC	142.8m	B	110° 27' 10"
CD	139.6m	C	102° 49' 50"
DE	141.0m	D	105° 08' 15"
EA	134.3m	E	106° 19' 20"

Adjust the traverse by transit-rule and compute independent co-ordinates of the traverse. Take co-ordinates of point E as (100;100)m. **(16)**

Unit - IV

4. a) Explain the method of carrying the level across a stream by reciprocal level and arrive at suitable expression for the same. **(6)**

b) A level was set up at a point P at a distance 150m from A and 1250m from B. The staff reading on the staff held on A was 0.765m and that on the staff held on B was 2.355m. Find true difference in elevation between A and B. Take radius of earth as 6375 km. **(5)**

c) Define following -

i) Level surface.

ii) **Reduced level.**

iii) Temporary bench mark.

iv) Profile levelling.

v) Height of instrument axis. **(5)**

Or

4. a) Draw neat and clean enumerated sketch of a Dumpy level and explain its working and use in leveling. **(8)**

b) A Dumpy level was set at A,B,C,D and E and staff readings were taken as listed below-

Level at	Staff readings-
A	2.575; 0.865; 0.890; 0.415
B	1.650; 1.430; 0.610
C	1.000; 1.590; 1.115
D	2.430; 3.845; 3.780; 2.785
E	2.630; 2.100; 2.290.

The first staff reading while level was at A was taken at T.B.M having R.L 250.000m. Tabulate the readings and compute the R.L of each staff station using rise and fall method. Apply all usual arithmetic checks. **(8)**

Unit - V

5. a) Explain Bessel's graphical method of solving three point problem of resection in plane table surveying. **(8)**

   b) Describe various characteristics of contours. **(8)**

Or

5. a) Define contour interval and contour gradient. **(3)**

   b) Describe any one method of contouring and plotting of contours. **(5)**

   c) Describe method of plane table traversing. **(8)**

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