Total number of printed pages – 7   **B. Tech**

PCCI 8201

Fourth Semester Examination – 2008

SURVEYING – I
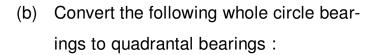
Full Marks – 70

Time : 3 Hours

*Answer Question No. **1** which is compulsory and any **five** from the rest.*

The figures in the right-hand margin indicate marks.

1. Answer the following questions :   2 ×10

    (a) The length of a line measured with a 20 metre chain was found to be 250 metres. Calculate the true length of the line if the chain was 10 cm too long.

    (b) Convert the following whole circle bearings to quadrantal bearings :

        (i) 22° 30'

        (ii) 170° 12'

        (iii) 211° 54' and

        (iv) 327° 24'.

    (c) The following are the observed fore-bearings of the lines

        (i) AB 12° 24'

        (ii) BC 119° 48'

        (iii) CD 266° 30'

        (iv) DE 354° 18'

        Calculate their back bearings.

    (d) The magnetic bearing of a line is 48° 24'. Calculate the true bearing of the line if the magnetic declination is 5°38' East.

P.T.O.   **PCCI 8201**   **2**   **Contd.**

(e) Find the magnetic declination at a place if the magnetic bearing of the sun at noon is 184°.

(f) What are ''face left'' and ''face right'' observations ? Why is it necessary to take both face observations ?

(g) Distinguish between : close traverse and open traverse.

(h) What is parallax ? How can you eliminate it ?

(i) List the various uses of contour maps.

(j) List the various instruments and accessories needed to do plane table surveying.

2. (a) A 20 m chain used for a survey was found to be 20.10 m at the beginning and 20.30 m at the end of the work. The area of the plan drawn to a scale of 1 cm = 8 m

was measured with the help of a planimeter and was found to be 32.56 sq. cm. Find the true area of the field.   5

(b) What are the different tape corrections and how are they applied ?   5

3. (a) To continue a survey line AB past an obstacle, a line BC 200 metres long was set out perpendicular to AB, and from C angles BCD and BCE were set out at 60° and 45° respectively. Determine the lengths which must be chained off along CD and CE in order that ED may be in AB produced. Also, determine the obstructed length BE.   5

(b) What are the instruments used in chain surveying ? How is a chain survey executed in the field ?   5

4. (a) The following bearings were observed with a prismatic compass. Calculate the interior angles. 4

Line	Fore bearings
AB	60° 30'
BC	122° 00'
CD	46° 00'
DE	205° 30'
EA	300° 00'

(b) The following bearings were observed while traversing with a prismatic compass. 6

Line	Fore Bearing	Back Bearing
AB	45° 45'	226° 10'
BC	96° 55'	277° 05'
CD	29° 45'	209° 10'
DE	324° 48'	144° 48'

Mention which stations were affected by local attraction and determine the corrected bearings.

5. (a) What are the different types of errors encountered in theodolite work ? How are they eliminated ? 4

(b) What do you mean by "balancing a traverse" ? Explain clearly, with the help of illustrations, how a traverse is balanced ? 6

6. (a) The following staff readings were observed successively with a dumpy level, the instrument have been moved after third, sixth and eighth readings :

2.228 ; 1.606 ; 0.988 ; 2.090 ; 2.864 ; 1.262 ; 0.602 ; 1.982 ; 1.044 and 2.684 metres.

Enter the above readings in a page of a level field book and calculate the R.L. of points if the first reading was taken with a staff held on a bench mark of 432.384 m. 6

(b) During a construction work, the bottom of a R.C. Chhajja A was taken as a temporary Bench Mark (R.L. 63.120 m). The following notes were recorded.

Reading on inverted staff on B.M. A : 2.232 m

Reading on peg P on the ground : 1.034 m

Change of instrument

Reading on peg P on the ground : 1.328 m

Reading on inverted staff on bottom of cornice B : 4.124 m

Enter the above readings in a page of a level field book and calculate the R.L. of the cornice B. 4

7. (a) Discuss the various methods of interpolating the contours. 5

(b) Discuss the advantages and disadvantages of plane table surveying over the other methods of surveying. 5

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