**Registration no:** | | | | | | | | | | |

**Total Number of Pages: 2**

**B.TECH**
**PCCE4205**

# 4th Semester Regular / Back Examination 2015-16

## SURVEYING- I

**BRANCH: CIVIL, MECH**

**Time: 3 Hours**

**Max marks: 70**

**Q. CODE: W453**

**Answer Question No.1 which is compulsory and any five from the rest.**
**The figures in the right hand margin indicate marks.**

**Q1** Answer the following questions: **(2 x 10)**

**a)** What do you mean by Geodetic survey?

**b)** Differentiate between main station and tie station?

**c)** The true length of a line measured from a plan as per scale was 1050.84 m. When the line was measured with a 30 m long chain, the length was measured as 1052.94 m. Find the true length of the chain.

**d)** Differentiate between true bearing and magnetic bearing.

**e)** State the advantages of plane table surveying?

**f)** The magnetic bearing of sun at noon was $150^0$C. Calculate the magnetic declination.

**g)** Write an arithmetic check in the reduction of levels by rise and fall method.

**h)** Find the distance to the visible horizon if the height at which the observer stands on top of a tower is 80 m. Take the radius of the earth as 6370 km.

**i)** The contour interval on a map is 12 m. If the upward gradient of 1in 20 is required to be drawn between two points, what will be the horizontal equivalent?

**j)** What instrumental errors are eliminated by face left and face right observations?

**Q2**

**a)** Describe the different methods of setting out a right angle at a point on a chain line using a chain/tape only. **(5)**

**b)** A line was measured with a 30 m long steel tape, standardized at $15^0$C, with a pull of 100 N. Find the correction per tape length, if the temperature at the time of measurement was $20^0$C and the pull exerted was 160 N. **(5)**
Weight of 1 $cm^3$ of steel is 0.0786 N
Weight of tape is 8N
Modulus of elasticity is $2.1 \times 10^5$ N./$mm^2$
Coefficient of expansion of tape/$^0$C is $7.1 \times 10^{-7}$.

**Q3**

**a)** The observed bearings of a closed traverse are given below. Find the stations affected by local attraction and correct the bearings by finding the local attraction at the affected stations. **(7)**

| Line | AB | BC | CD | DA |
|---|---|---|---|---|
| Bearing | $36^0$ 00’ | $98^0$ 15’ | $201^0$ 45’ | $322^0$ 45’ |
| Line | BA | CB | DC | AD |
| Bearing | $216^0$ 45’ | $276^0$ 00’ | $203^0$ 15’ | $142^0$ 45’ |

**b)** What are the advantages and disadvantages of compass survey? **(3)**

**Q4**

**a)** Draw a neat sketch to indicate the following: level surface, horizontal surface, vertical line and datum surface. **(4)**

**b)** The following readings refer to the reciprocal observations from two points on either side of river. Determine the true difference of elevation and the collimation error, if any, of the instrument. The distance between the stations = 1200 m. **(6)**

| Instrument at | Reading of staff at | |
|---|---|---|
| | A | B |
| A | 1.115 | 1.765 |
| B | 1.750 | 2.315 |

**Q5** The consecutive readings taken during a leveling operation are as follows: 0.685, 1.315,-1.825, -0.635, 1.205, 1.235, 2.631, 1.355, -2.015. The instrument was shifted after the third and sixth readings. The third reading was taken to a benchmark of assumed elevation 100. Find the reduced levels of the points.

**a)** Using Height of collimation method. **(5)**

**b)** Using Rise and Fall method. **(5)**

**Q6** **a)** Explain any four important characteristics of contours with neat sketches. **(4)**

**b)** Explain the three point problem and the different methods of solving it. **(6)**

**Q7** **a)** Explain the procedure for the reiteration method of measuring horizontal angle. **(5)**

**b)** List the fundamental lines of a theodolite. Explain briefly the desired relationships between these lines and the effects if such relationships are not maintained. **(5)**

**Q8** Write short notes on any **two** of the following **(5 x 2)**

**a)** Errors in plane table survey

**b)** Methods of contouring

**c)** Temporary adjustment of theodolite.

**d)** Sensitivity of level tube.