Printed Pages : 3

NCE-303

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 100313

Roll No.

B. Tech.

(SEM. III) (ODD SEM.) THEORY EXAMINATION, 2014-15

SURVEYING - I

Time : 2 Hours] [Total Marks : 50

Note : Attempt **all** questions.

1 Attempt any **four** parts of the following : **3.5×4=14**

(a) Find the hypotenusual allowance per chain of 30 m length if the angle of slope is 12° 30'.

(b) The magnetic bearing of a line as observed is 269°. If the local attraction at this point is known to be 5°E and the declination is 15°W, what is the true bearing of the line ?

(c) What are the fundamental lines and their desired relations in a theodolite.

(d) Give brief description of total station.

(e) Differentiate between prismatic compass and surveyor's compass.

(f) A steel tape was exactly 30 m long at 20°C when supported through out under a pull of 10 kg. A line was measured with this tape under a pull of 15 kg and at a temperature of 32°C and found to be 780 m long. The cross-sectional area of the tape = 0.03 cm^2, total weight of tape = 0.693 kg, α for steel = 11×10^{-6} per °C, E for steel = 2.1×10^6 kg/cm^2. Compute true length of line if tape is supported at every 30 m.

2 Attempt any two parts of the following : **6×2=12**

(a) A tacheometer provided with anallatic lens and having multiplying constant 100 is employed to find the gradient of line PQ from the following observations :

Staff Station	Bearing	Top hair reading	Middle hair reading	Bottom hair reading	Vertical angle
P	345°	0.900	1.772	2.544	+15°
Q	75°	0.750	2.205	3.660	+10°

Calculate the gradient of lines PQ.

(b) The following are observations in reciprocal levelling :

Instrument near	Staff reading at		Remarks
	A	B	
A	1.825	2.750	Distance AB = 1020 M
B	0.930	1.615	RL of A = 126.325 M

Find true RL of B and combined correction for curvature and refraction.

(c) Define contour and write characteristics of contour.

3 Attempt any **two** parts of the following : **6×2=12**

(a) Two straight lines AC and CB to be connected by a 3°C intersect at a chainage of 2760 m. The WCB of AC and CB are 45° 30' and 75° 30' respectively. Calculate radius, tangent length, curve length, length of long chord, chainage of point of commencement and tangency.

(b) State the different methods of calculating length of transition curve.

(c) Explain Rankine's method of setting out of a circular curve.

4 Attempt any **two** parts of the following : **6×2=12**

(a) Discuss various methods of theodolite traversing.

(b) Describe various rules to adjust closing error occuring in a closed traverse.

(c) What is the purpose of a satellite station in triangulation ? Derive an equation to obtain angle at triangulation station with the help of satellite station observation which is inside the triangle.
