5. a) Define Remote sensing and its types.

   b) Define the scale of vertical photograph.

   c) Explain the term "overlapping" in photogrammetry. Discuss in brief.

   d) Describe the methods of hydrographic surveying.

OR

Describe Sounding. What are the different equipments used in sounding?

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Total No. of Questions : 5] *[Total No. of Printed Pages : 4*

Roll No .....

CE-403

B.E. IV Semester

Examination, December 2016

Surveying

Time : Three Hours

Maximum Marks : 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.

ii) All parts of each question are to be attempted at one place.

iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.

iv) Except numericals, Derivation, Design and Drawing etc.

1. a) What are the different methods of indirect levelling?

   b) Define the 'error of closure' in a closed traverse.

   c) What do you mean by balancing of traverse? Explain any one method in brief.

   d) The R.L. of top of a chimney is to be determined. The observations were made from two instrument station P and R at a horizontal distance 60 m apart. The P and R are in a line with Q and angle of inclination when sighted to Q by a theodolite at P and R were 26°40' and 16°10' respectively. The staff reading upon the B.M. of elevation 263.40 m were 2.600 m and 3.200 m, when the instrument was at P and R with telescope being horizontal. Find RL of Q and its horizontal distance from P.

OR

A theodolite traverse was conducted in the anticlockwise direction and the following data were recorded.

The length of CD and bearing of DE having been omitted.

Line	Length, m	Azimuth
AB	281.4	S69°11'E
BC	129.4	N21°49'E
CD	?	N19°34'W
DE	144.5	?
EA	168.7	S74°24'W

Determine the length of CD and the bearing of DE.

2. a) Define the tacheometric constants.
   b) Mention the fundamental difference in Stadia method and Subtense method.
   c) Explain the use of anallactic lense in Tacheometer.
   d) Describe the working of subtense bar. Explain the effect angular error on horizontal distance measurement.

OR

A tacheometer was set-up at station P and the following readings were recorded on a vertically held staff at Q.

Station	Staff station	Vertical angle	Stadia hair reading m	Remarks
P	BM	–2°26'	3.120, 3.450, 3.700	RL of BM =
	Q	+7°45'	1.600, 2.455, 3.160	430.600 m

Calculate the horizontal distance from P to Q and the RL of Q, if the tacheometric constants are 100 and 0.3.

3. a) Define the term "Sharpness of Curve".
   b) Explain the use of transition curve on horizontal alignment of Road.
   c) Explain the different types of vertical curves based on grades.
   d) Describe the five elements of simple circular curve. Derive their expressions.

OR

A compound curve is made up of two arcs of radii 380 m and 520 m. The deflection angle of the combined curve is 105° and that of first arc of radius 380 m is 58°. The chainage of the first tangent point is 848.55 m. Find the chainages of the point intersection, common tangent point, and forward tangent point.

4. a) Define the term "Triangulation figure".
   b) What do you mean by well-conditioned triangle?
   c) Explain the wheeler's base line apparatus.
   d) Describe the different tape corrections applied during base line measurement in a triangulation survey.

OR

Two triangulation station P and Q are at a distance of 80 m from each other. Both stations have elevation of 238 m and 276 m respectively. Find the minimum height of signal required at Q, so that line of sight just pass over the intervening ground whose elevation is 200 m.