The altitude of two proposed station A and B, 80km apart are respectively 225m and 550m. The intervening obstructions situated at c, 40km from A has an elevation of 285m. Ascertain, if A and B are intervisible, and if necessary find by how much B should be raised so that the line of sight must nowhere be less than 3m above the surface of ground.

a) Write the principle of remote sensing.

b) Explain the scale of a vertical photograph.

c) Explain the term "Crab and Drift".

d) Describe the methods of soundings.

OR

A section line AB appears to be 10.10cm on a photograph for which the focal length is 16cm. The corresponding line measures 2.54cm on a map which is to a scale 1/50,000. The terrain has an average elevation of 210m above mean sea level. Calculate the flying altitude of the aircraft, above mean sea level, when the photograph was taken.

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Roll No .....

CE-403

B.E. IV Semester

Examination, June 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) Define the closing error in closed traverse

b) State the rules used to balance the traverse.

c) Explain the working of EDM.

d) The following observations were made for a closed traverse round an obstacle. Due to obstructions, length of line DE and EA could not be measured. Find out the missing length.

Line	Length(m)	Bearing
AB	550	98°30'
BC	600	30°15'
CD	450	298°15'
DE	?	230°00'
EA	?	150°10'

OR

The following observations were made on a hill top Q to ascertain its elevation. The height of the target, P was 6m.

Instrument station	Staff Reading on BM (m)	Vertical angle on target, P at hill top	RL of BM (m)
A	2.500	18°10'	340.550
B	1.650	27°30'	340.550

The instrument station were 60m apart and were in line with P.

2. a) Define the tacheometric constants.
   b) Explain the difference between fixed hair and movable hair method.
   c) Describe the tangential system of tacheometry.
   d) Determine the gradient from point P to a point Q and the distance PQ. The observations were made with tacheometer and the staff was held vertical at each of the station. The instrument was fitted with an anallactic lense.

Instrument station	Staff station	Bearing	Vertical angle	Staff Readings
O	P	134°	+10°32'	1.365, 1.920 2.475
	Q	224°	+5°6'	1.065; 1.885 2.705

OR

Write the short notes on following:
i) Direct Reading Tacheometer
ii) Contouring by Tacheometer

3. a) Define transition curve and write the intrinsic equation of ideal curve.
   b) Explain the different types of vertical curves.

   c) Describe the elements of compound curves in brief.
   d) Two tangents intersect at a chainage of 1322.5m, the deflection angle being 26°. Calculate the following for setting out a curve of radius 270m.
      i) Tangent length
      ii) Length of long chord
      iii) Length of curve
      iv) Chainage of point of commencement and tangency
      v) Apex distance
      vi) Versed sine of curve

OR

A transition curve is required for a circular curve of radius 220m, the gauge being 1.5m and maximum super elevation restricted to 15cm. The transition curve is to be designed for a velocity such that no lateral pressure is imposed on the rails and the rate of gain of radial acceleration is 30cm/sec^3. Calculate the required length of the transition curve and design speed.

4. a) Define the term "triangulation figure".
   b) Explain the importance of well conditioned triangle in triangulation survey.
   c) Discuss the points to be kept in mind, while selecting the triangulation station.
   d) Describe the method of base line measurement in triangulation.

OR