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Roll No.....

CE-502 (GS)

B.E. V Semester

Examination, December 2017

Grading System (GS)

Advanced Surveying

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five questions.
ii) All questions carry equal marks.

1. a) Derive the expression for the horizontal and vertical distances in the fixed hair method when the staff is held vertically and the measured angle is that of elevation.

   b) During the course of a tacheometric survey. The following readings were recorded.

Instrument station	Height of instrument	Staff station	Vertical angle	Staff reading	Remark
O	1.750	BM	–8°24'	1.250, 1,600, 1.950	RL of BM=312.670
O	1.650	CP	–7°12'	1.430, 1.580, 1.730	CP is change point
P	1.570	CP	+9°36'	1.670, 1.950, 2.230	

   The tacheometer was anallatic and the multiplying constant was 100. The staff was held vertical. Calculate the RL of station P.

2. a) What is meant by Triangulation? How will you select base line and triangulation stations? Explain strength of figure.

   b) Define accidental error, true value, direct observation conditioned quantity most probable value true error normal equation.

3. What is the principle of E.D.M.? Discuss electromagnetic waves and electromagnetic spectrum.

4. a) What is Spherical Triangle? State the properties of spherical triangle.

   b) What is latitude of a place? Prove that the altitude of the pole is always equal to the latitude of the observer's position.

5. a) Define the following terms used in aerial photogrammetry.
   i) Oblique Photography ii) Exposure station
   iii) Focal length iv) Principal point
   v) Nadir point vi) Isocentre
   vii) Swing

   b) Find most probable values of angles A, B and C of triangle ABC from the following observation equations :
   A = 60° 12' 36" B = 53° 46' 12" C = 58° 01' 16"

6. a) Write short note on "Station marks".

   b) What is Tacheometric Surveying? What are the advantages of tacheometric surveying? Explain various methods of tacheometry.

7. a) What is relief displacement? Derive an expression for the relief displacement in a vertical photograph.

   b) In a pair of overlapping vertical photographs, the mean distance between two principal points both of which lie on the datum is 6.375cm. At the time of photography the air-craft was 600m above the datum. The camera has a focal length of 150mm. In the common overlap a tall chimney 120m high with its base in the datum surface is observed. Determine difference of parallax for top and bottom of chimney.

8. a) What is Remote Sensing? State how it differs from photogrammetry. Describe energy interaction with atmosphere and earth surface features.

   b) Explain the basic principle of remote sensing. Discuss image interpretation techniques.

9. a) What is Geographical Information System (GIS)? Explain key components of GIS. List various functions of GIS.

   b) Explain the various applications with suitable examples of Remote Sensing and GIS in civil engineering.

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