Total No of Questions: [12] *SEAT NO. :* [ ]

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T.E. (Civil) (Semester I) Examination, 2014

ADVANCED SURVEYING (301005)

Time: 3 Hours *Max. Marks : 100*

Instructions to the candidates:

1) *Answers to the two sections should be written in separate answer books.*
2) *Answer any three questions from each section.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right side indicate full marks.*
5) *Use of Calculator is allowed.*
6) *Assume Suitable data if necessary*

SECTION I

Q1) a) What is meant by side equation? State the equations of condition which must be? [8]

b) What is GPS? State and explain various components of GPS. ? [5]

c) What are the various points to be considered for selection of a triangulation station? [5]

or

Q2) a) The altitudes of two proposed stations A and B, 100 km apart, are respectively 420 m and 700 m. the intervening obstruction situated at C, 70 km from A has an elevation of 478 m. 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 3 m above the surface of the ground. [8]

b) What are the various potential error sources that affect the GPS signal or result? [5]

c) Differentiate between Absolute positioning and Relative positioning. [5]

Q3) a) Explain the following terms: [5]

(i) True Value
(ii) True error
(iii) Most probable value
(iv) Residual error
(v) Conditioned equation

b) Explain with neat sketch, spherical excess. [5]

c) The angles of a triangle ABC were recorded as follows: [6]

A = 77° 14' 20"	weight 4
B = 49° 40' 35"	weight 3
C = 53° 04' 52"	weight 2

Give the corrected values of the angles.

or

Q4) a) What do you mean by weight of an observation? State the rules of assigning weight to the field observations. [5]

b) Explain the following terms: [5]

(i) Independent quantity

(ii) Direct observation

(iii) Indirect observation

(iv) Weight of an observation

(v)Mistake

c) Explain stepwise procedure of computations of sides of a Spherical Triangle by Spherical Trigonometry. [6]

Q5) a) Derive the expression for the difference of level between two points A and B a distance D apart with the vertical angle as the angle of elevation from A to B. The height of the instrument at A and that of the signal at B are equal. [10]

b) Explain with a neat sketch how the alignment of tunnel is transferred from surface to the underground. [6]

or

Q6) a) Find the difference of levels of the points P and Q and the R.L. of P from the following data: [10]

Horizontal distance between P and Q	= 7118 m
Angle of depression to P at Q	= 1° 32' 12"
Height of signal at P	= 3.87 m
Height of instrument at Q	= 1.27 m
Co-efficient of refraction	= 0.07
R.L. of Q	= 417.860 m

Take Rsin 1" = 30.88 m

b) Describe in brief the location survey of a long bridge. [6]

SECTION II

Q7) a) Define relief. Derive an expression for displacement due to ground relief. [8]

b) The scale of an aerial photograph is 1 cm =160 m, and the size of the photograph is 20 cm by 20 cm. If the longitudinal lap is 65% and the side lap is 35%, determine the number of photographs required to cover an area of 232 sq. km.Also explain why is it necessary to have longitudinal lap more than 50%. [10]

OR

Q8) a) Explain how will you calculate air base distance using aerial photogrammetry and how will calculate the scale of aerial photograph if you are given the toposheet of the same area. [10]

b) Write a note on Radial line method of plotting. [8]

Q9) a) What is raster and vector data. How do you analyse the satellite image for civil

engineering projects, draw sketches to support your answer.

b) State and explain various components of GPS. Differentiate between absolute positioning and relative positioning. 8

OR

Q10) a) What is GIS. State various GIS software's and explain how remote sensing and GIS are linked. 8

b) What is the working principle of Total station? How will you use Total station to determine the remote Elevation (RDM)? 8

Q11) a) What is hydrographical surveying? How do you carry out hydrographical surveying to determine the cross section of a river for construction of bridge? 8

b) Explain lead line method and sonic method to measure sounding 8

OR

Q12) a) State various methods of locating the position of boat in hydrographical surveying and explain briefly i) two angles from the boat and ii) intersecting ranges. 8

b) What is latest technique of measuring sounding? Explain its use in assessing the amount of silt deposition in the water body. 8