[3863] – 305

T.E. (Civil) (Semester – I) Examination, 2010
ADVANCED SURVEYING (New)
(2008 Course)

Time : 3 Hours Max. Marks : 100

SECTION – I

1. a) Define Geodetic Surveying. What factors are to be considered while selecting a best triangulation figure or system ? 6

   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

2. a) What are the various potential error sources that affect the GPS signal or result ? 5

   b) Differentiate between Absolute positioning and Relative positioning. 5

   c) There are two stations A and B at elevations of 200 m and 1000 m respectively. The distance between A and B is 100 km. If the elevation of a peak P at a distance of 40 km from A is 300 m. Show that station A and B are intervisible. 6

3. a) Find the most probable values of the angles A, B and C of a triangle ABC from the following observations (Use method of differences). 8

   $A = 65° 15' 30''$ weight = 3

   $B = 51° 11' 25''$ weight = 2

   $C = 63° 32' 34''$ weight = 4

   b) Explain stepwise procedure of computation of sides of a Spherical Triangle by Spherical Trigonometry. 6

   c) Define following terms. 4

   1) Conditioned equation
   2) Weight of an observation
   3) Most probable value
   4) Mistake.

OR

P.T.O.

4. a) Explain step by step procedure of figure adjustment of a Geodetic quadrilateral without central station. **6**

b) What is spherical excess ? How it is calculated ? **4**

c) The following are the observed values of an angle : **8**

Angle	Weight
40° 20′ 20″	2
40° 20′ 18″	2
40° 20′ 19″	3

Find i) Probable error of single observation
ii) Probable error of weighted arithmetic mean
iii) Probable error of single observation of weight 3.

5. a) The following reciprocal observations were made at two points P and Q. **10**

Angle of depression of Q at P = 7′ 35″
Angle of depression of P at Q = 9′ 05″
Height of signal at P = 4.82 m
Height of signal at Q = 3.95 m
Height of instrument at P = 1.15 m
Height of instrument at Q = 1.28 m
Distance between P & Q = 36320 m

Calculate i) The R.L. of Q if that of P is 395.46 m
ii) Average coefficient of refraction at the time of observation.
Take R sin 1″ = 30.88 m.

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

OR

6. a) The following observations were taken in a trigonometric levelling survey. **10**

Angle of depression to P at Q = 1° 45′ 32″
Height of instrument at Q = 1.18 m
Height of signal at P = 4.22 m
Horizontal distance between P & Q = 6945 m
Coefficient of refraction = 0.07
If the R.L. of Q is 345.32 m, calculate R.L. of P.

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

SECTION – II

7. a) Explain with reference to aerial photograph, what is meant by end overlap and side overlap and why they are required ? 6

b) A pair of photograph is taken with a camera having focal length 15 cm. The scale of photography is 1 : 10000 and photobase is 5.65 cm. The measured parallax of a vertical control point having an elevation 140 m is 87.28 mm. Compute the elevation of another point P whose measured parallax is 84.18 mm. 6

c) What is digital photogrammetry ? Draw neat schematic diagram of digital photogrammetric environment and discuss in brief various elements of digital photogrammetry. 6

OR

8. a) What is parallax of a point in photogrammetry ? Describe the procedure of measuring parallax using parallax bar. 6

b) Two points P and Q have elevation 280 m and 650 m above the datum respectively. The coordinates of P and Q measured from the photograph taken with camera having focal length of 15 cm are tabulated below. 6

Point	Co-ordinate	
	X	Y
P	+ 35.4 mm	+ 17.5 mm
Q	– 25.8 mm	+ 39.6 mm

Calculate length of PQ. Flying height is 3000 m above datum.

c) What is DEM ? How to acquire data required to develop a DEM ? State use of DEM. 6

9. a) Discuss in brief various kinds of resolution in respect of remotely sensed images. 5

b) Explain with sketches the term atmospheric window and spectral signature. 6

c) What makes data spatial ? State difference between vector and raster data. Draw sketches to support your answer. 5

OR

10. a) List down few GIS softwares and discuss in brief features of any one of such software. 6

b) Define datum. State difference between local and global datum and bring out concept of datum transformation. 5

c) Discuss in brief applications of remote sensing in mapping. 5

11. a) Define Hydrographic surveying and enlist various objectives of hydrographic surveying. 5

b) The $\angle ASB$ 30° 25′ and $\angle BSC$ = 45° 25′ are measured with a nautical sextant at a sounding station O with respect to three control stations A, B, and C on bank. Stations B and O being on opposite sides of line AC. AB = 4 km, BC = 4.995 m and AC = 8.169 km. Work out distances of the sounding station O from station A, B and C. 6

c) Describe in brief the process to carry out hydrographic survey to plot cross section of a river about 400 m wide and with not more than 10 m depth of standing water at the proposed bridge site. 5

OR

12. a) What is mean by sounding ? Enumerate different instruments required for sounding proper and explain echo sounding. 5

b) What is tidal gauge ? List down different types of tidal gauges. Explain any one type of tidal gauge. 5

c) When it is required to reduce the planimetric position of a sounding station by solving a three point problem. Enlist the method to solve a three point problem. Explain any one mechanical method. 6