

B.E./B.Tech. (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL 2011

GEOINFORMATIC ENGINEERING BRANCH

FIFTH SEMESTER

**GI 371 ENGINEERING SURVEY III**

(Regulation 2004)

Time : 3 Hours.  
100

Maximum Marks:

Answer ALL questions**PART A – (10 X 2 = 20 marks)**

1. Define a) Vertical Equinox b) Azimuth
2. What is Equation of Time?
3. List the contents in Nautical Almanac.
4. Write the importance of Reconnaissance Survey in Route Surveying.
5. For the circular curves having a radius 610m, what is the degree of curvature by (a) arc definition and (b) chord definition?
6. Write the purpose of Transition Curve.
7. What is Weisbach Triangle?
8. List various wavelengths used Electronic Distance Measurement.
9. How does an Automatic Total Station works?
10. Write the applications of inertial positioning systems.

**PART B – (5 X 16 = 80 marks)**

- 11(a) (i) Explain different time systems used in astronomical surveying 10
- (ii) What is local mean time at places (a) Kandla with longitude of  $70^{\circ} 20' E$  6  
(b) Kohima with longitude of  $94^{\circ} 06' E$  for a given Indian standard time of 18 hours 28 minutes 10 seconds. The standard time meridian used in India is  $82^{\circ} 30' E$ .
- 12(a) At a instrument station with latitude of  $55^{\circ} 46' 12'' N$ , the apparent altitude of a 16  
Star was found to be  $23^{\circ} 17' 32''$  at 9h 17m P.M (GMT). The horizontal angle between RM and star was  $68^{\circ} 24' 30''$ . Find the azimuth of the star given that  
Star's declination of GAN on day of observation =  $17^{\circ} 46' 52'' N$   
Variation of declination per hour =  $- 37''$   
Refraction for altitude  $23^{\circ} 20' = 0^{\circ} 2' 12''$   
Parallax for altitude =  $0' 8''$   
Equation of time (mean) =  $6m 0''$

(OR)

- (b) (i) What are the corrections applied to apparent altitude? Write their significance. 6
- (ii) What are different methods used for determination of Latitude? Explain any one method in detail. 10
- 13(a) What are the different surveys conducted to fix the alignment of a Highway? Explain them in detail. 16

(OR)

- (b) (i) What are the difficulties faced in Underground levelling and How do you overcome those difficulties? 6
- (ii) Explain the setting out procedure for Tunnel Alignment. 10
- 14(a) Explain the method of setting out a circular curve using Deflection Angle with the help of a neat sketch. 16

(OR)

- (b) (i) Draw different types of vertical curves used in railways. 6
- (ii) Calculate and tabulate the reduced levels of various station pegs spaced at 20m on a 240m vertical curve connecting two uniform grades of +1.25% and -2.75%. The chainage and reduced level of intersection point are 125.25m and 204.70m respectively. 10
- 15(a) Explain the following programs available with a total station instrument 16
- i) Remote Elevation Measurement    ii) Missing Line Measurement
- iii) Area Calculation                      iv) Automatic Azimuth Angle setting

(OR)

- (b) (i) Explain with a neat sketch, the working principle of Global Positioning System. 8
- (ii) What is Digital Terrain Model? Write about various methods used to derive Digital Terrain Models. 8