

**B.E /B.Tech (Full Time) DEGREE END SEMESTER EXAMINATION, APRIL/MAY 2011**

**GEOINFORMATIC ENGINEERING BRANCH**

**FIFTH SEMESTER (Regulation 2008)**

**GI9301 Surveying III**

36

Time: 3 Hours

Maximum Marks: 100

Answer All Questions

PART A – (10 X 2 = 20 Marks)

1. Differentiate Sensible Horizon and True Horizon
2. Calculate the distance in kilometers between the two points A and B along the parallel of latitude, given that

| Points | Latitude | Longitude |
|--------|----------|-----------|
| A      | 28°42'N  | 31°12'W   |
| B      | 28°42'N  | 47°24'W   |

3. What is the Local Mean Time at longitude 35°27'22" E corresponding to Indian Standard Time of 9AM?
4. List the various methods to determine the latitude of a place.
5. What are the uses of remote sensing technique in route surveying?
6. Define the following terms in mine surveying.  
(a) Cross cut (b) Adit
7. Why special types of survey instrument are required in mine survey?
8. What are the functions of transition curve?
9. What is meant by the "rate of grade change" on vertical curves?
10. List the applications of Digital Terrain Model.

PART – (5 X 16 = 80 Marks)

11. i. Determine the Hour angle and Declination of a star from the following data: (8)  
 Altitude of the star = 21° 30' 45"  
 Azimuth of the star = 140° 25' 32" E  
 Latitude of the observer = 48° 00' 32" N
- ii. Explain the different systems of coordinate employed to locate the position of a heavenly body. (8)

- 12a. i. Explain the field procedure to determine the azimuth by ex-meridian observation on the sun. (8)  
 ii. The following observations of the sun were taken for azimuth of a line in connection with a survey. (8)  
 Mean time =  $16^{\text{h}} 30^{\text{m}}$   
 Mean horizontal angle between the sun and the referring object =  $18^{\circ} 20' 30''$   
 Mean corrected altitude =  $33^{\circ} 35' 10''$   
 Declination of the sun from nautical almanac =  $22^{\circ} 05' 36''$  N  
 Latitude of place =  $52^{\circ} 30' 20''$  N  
 Determine the azimuth of line.
- (OR)
- 12b. i. The local sidereal time at a place (Longitude  $112^{\circ} 20' 15''$  W) is  $18^{\text{h}} 28^{\text{m}} 12^{\text{s}}$ . Calculate the corresponding L.M.T given that G.S.T at G.M.M is  $8^{\text{h}} 10^{\text{m}} 28^{\text{s}}$  on that day. (10)  
 ii. What is Equation of Time? Discuss the two reasons for variation in equation of time. (6)
- 13a. i. Explain the major elements of Route Surveying. (12)  
 ii. The horizontal angle between two points A and B observed with the side telescope (auxiliary) of a mining transit is  $44^{\circ} 18'$ . The distance between the centers of the main and auxiliary telescopes is 60mm. The distances of A and B from the auxiliary telescope are 30.25m and 28.18m respectively. Reduce the angle to the centre. (4)
- (OR)
- 13b. i. Explain the steps involved in setting out of Tunnel alignment. (12)  
 ii. What are the factors to be considered for High voltage tower line survey? (4)
- 14a. i. Two roads meet at an angle of  $127^{\circ} 30'$ . Calculate the necessary data for setting out a curve of 300m radius to connect the two straight portion of the road by chain and offset only. (8)  
 ii. Explain the step-by-step procedure involved in setting out of simple curve by Rankine's method. (8)
- (OR)
- 14b. i. Explain the element of reverse curve with neat sketch. (8)  
 ii. A compound curve is to connect two straights having a deflection angle of  $90^{\circ}$ . As determined from the plan, the lengths of the two tangents are 350m and 400m respectively. Calculate the lengths of two arcs if the radius of the first curve is 300m. (8)
- 15a. i. What are the inbuilt functions are present in the Total Station? Explain any three inbuilt functions in detail. (12)  
 ii. Discuss the different types of theodolite. (4)
- (OR)
- 15b. i. Explain the working principle of ALTM. (8)  
 ii. Explain the segments in NAVSTAR GPS. (8)