

Roll No. ....

Total Pages : 04

**BT-4/M-20**  
**SURVEYING-II**  
**CE-210E**

**34022**

Time : Three Hours]

[Maximum Marks : 100

**Note** Attempt Five questions in all, selecting at least one question from each Unit. Any missing value may suitably be assumed. All steps are mandatory for numerical parts.

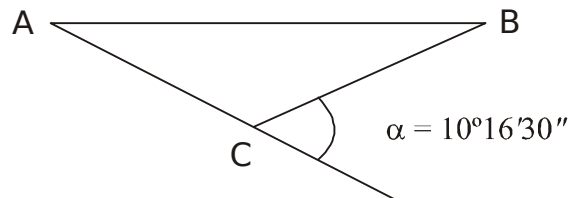
**Unit I**

1. (a) Find difference in elevation between two points A and B lying 10480 m apart. Angle of elevation of B (from A) =  $15'$ , angle of depression of A (from B) =  $33'$ , height of instrument at A and B = 1.42 m and 1.45 m respectively. Height of signals at A and B = 3.95 m and 3.92 m respectively. Determine curvature and refraction correction also.  
R sin  $1 \approx 30.38$  m. **10**
- (b) A base line AB could not be measured due to some obstruction. A station C by the side of AB was chosen and the angle at that station was measured.

**(3)L-34022**

**1**

Find length of baseline if  $AC = 858.5\text{ m}$  and  $CB = 1215.8\text{ m}$ . **10**



2. (a) Find RL of Q from the following observations :  
 $PQ = 9290\text{ m}$ , Angle of elevation from P to Q =  $2^\circ 18'$ , Height of signal at Q =  $3.96\text{ m}$ , HI at P =  $1.25\text{ m}$ , coefficient of refraction =  $0.07$ ,  
 $R \sin 10 = 30.88\text{ m}$ , RL of P =  $396.58\text{ m}$ . **10**
- (b) The altitudes of two proposed stations A and B  $130\text{ km}$  apart are  $220\text{ m}$  and  $1160\text{ m}$  respectively. The altitudes of two points C and D on the profile between them are  $308\text{ m}$  and  $632\text{ m}$  respectively.  $AC = 50\text{ km}$ ,  $AD = 90\text{ km}$ . Check intervisibility between A and B and find height of signal at B if needed. **10**

### Unit II

3. (a) Find the most probable value of angles P, Q and R of a triangle PQR from the following measurements using method of correlates :  
 $P = 70^\circ 31' 18.6$  (weight = 3),  $Q = 61^\circ 12' 11.8$  (weight = 2),  $R = 48^\circ 16' 6.6$  (weight = 4),

(3)L-34022

2

- P + Q = 134.3 (weight = 2). **10**
- (b) Discuss about different sources, types and reasons of various errors in surveying. What are various steps used to account for existence of errors in measurements ? **10**
4. (a) Write briefly about law of random/accidental errors. Discuss about probability curve with suitable equation. **10**
- (b) Adjust the angles of a triangle ABC by method of correlates. A = 86°35' (wt = 2), B = 42°15' (wt = 1), C = 54°00' (wt = 3). **10**

### Unit III

5. (a) Explain the following with diagram :  
Solstice, Right ascension, astronomical triangle, hour angle, prime vertical and local sidereal time. **10**
- (b) Find LAT, if longitude = 60°10' corresponding LMT = 10 h 20 m 30 s. ET at GMN = 5 m 4.35 s additive to the mean time and decreasing at the rate of 0.32 s/hr. **10**
6. (a) Define the following with diagram :  
Ecliptic, Equinoctial points, latitude, declination, celestial sphere, observer's meridian. **10**

(3)L-34022

3

- (b) Calculate hour angle and azimuth of sun at sunrise for a place in latitude =  $42^{\circ}30'$  declination =  $22^{\circ}12'$

**10**

#### **Unit IV**

7. (a) A pair of photographs was taken with an aerial camera from an altitude of 5000 m above mean sea level. The mean principal base is equal to 90 mm. The difference in parallax between two points is 1.48 mm. Find the difference in height between the two points if elevation of the lower point is 500 m above datum. What will be the difference in elevation if the parallax difference is 1.55 mm ?
- (b) Define parallax with suitable example and derive parallax equation. Provide neat diagram also. **10**
8. (a) Discuss about interaction of EMR with target and the factors affecting reflectance from a green leaf. Provide necessary diagrams also. **10**
- (b) What is GIS ? Discuss about various data systems used in GIS. **10**