



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

47

CIVIL ENGINEERING BRANCH

CE- 9254- SURVEYING - II  
(REGULATIONS 2008)

Time: 3hrs

Max Marks: 100

Instructions: 1. Draw Neat sketches wherever necessary.

Answer ALL Questions

Part - A (10 x 2 = 20 Marks)

1. What are the Philosophies of Surveying?
2. State the accuracies of Tacheometric surveying.
3. Mention the different methods of establishing horizontal and vertical control.
4. What is the satellite station? When is it resorted to?
5. What errors are eliminate and what not in reciprocal observations of trig. Leveling?
6. Enumerate the weight of an observation. Also write down the significance of Normal equation.
7. What are correlatives?
8. Mention the uses of Practical field astronomy in Civil Engineering.
9. What are the corrections applied to the measured altitude of the heavenly bodies?
10. List the recent advancements in the field of Surveying?

Part B (5 x 16 = 80)

11. Observation taken on the sun at a place in N 53° 29' 19" Give the tabulated data (Dec 3° 25' 6" S at 12 h UT decreasing at 59" per hour) Determine the true bearing of RO.

Object	Face	Readings		
		Horizontal Circle	Altitude	UT
RO	R	60°00'00"		
Sun +	R	191°38'00"	22°56'30"	15hr 12 min
Sun +	L	12°39'30"	22°13'00"	15hr 14 min
RO	L	240°00'00"		

12.a.i) Derive the stadia Tacheometric formula for the incline line of sight and vertical staffing (6)

ii) An Instrument at A, sighted on to a vertical staff held at B and C, in turn gave the following readings

Sight	Horizontal Circle	Vertical Circle	Staff reading (m)
B	05°20'	+ 4° 29' 00"	0.442/0.744/1.045
C	95°20'	- 0° 11' 40"	0.655/0.960/1.265

If the instrument constants are  $m= 100$ ,  $c= 0$  Calculate the gradient of the straight line BC (10)

(Or)

(P.T.O)

12.b.i) Write a detailed note of Total station survey equipment. (8)

ii) Explain in detail the GPS survey methods. (8)

13.a.i) Derive formulae for four cases of eccentric stations. (6)

ii) In joining triangulation of a survey for a new satellite town to the existing system, angles were measured from two stations A and B in the old triangulation to a flagstaff C on a church tower lying in the new area. To complete the adjustment of the triangulation, it is necessary to know the angle at C between the lines AC and BC. A station was set up at S, 10.21m from the flag staff and the following angles measured.

Station	Pointing	Angle
S	A	$0^{\circ} 00' 00''$
	B	$59^{\circ} 29' 40''$
	C	$131^{\circ} 53' 00''$

If the length of the line AC and BC were 3530m and 8700m respectively compute the angle ACB. (10)

(Or)

b) i) Derive the formula for eye object correction (4)

ii) The horizontal distance between two stations P and Q is 5931.30m. A theodolite at P on to a beacon adjacent to station Q at the time as a theodolite at Q sights on to a beacon adjacent to Station P. the following measurements are obtained: angle of elevation recorded at P =  $01^{\circ} 19' 38''$ ; angle of depression recorded at Q =  $01^{\circ} 21' 01''$ ; height of beacon at Q = 2.36m; height of instrument at P = 1.36m; height of instrument at Q = 1.47m; height of beacon at P = 2.85m.

Determine the difference in level between the two stations and the coefficient of atmospheric refraction (Assume the radius of the earth as  $6.37 \times 10^6$ m) (12)

14.a.i) Write down the characteristics of Gaussian distribution curve (4)

ii) The following angles were measured at a station O so as to close the horizon

AOB = $83^{\circ} 42' 28''$ . 75	weight 3
BOC = $102^{\circ} 15' 43''$ . 26	weight 2
COD = $94^{\circ} 38' 27''$ . 22	weight 4
DOA = $79^{\circ} 23' 23''$ . 77	weight 2

Adjust the angles using the method of least squares. (12)

(Or)

b) i) Explain briefly the various coordinate systems used in astronomy for location of a star. Why is it necessary to have several systems instead of one? (8)

ii) Calculate the Sun's azimuth at SUN set at a place having latitude  $42^{\circ} 30' N$ . The declination  $22^{\circ} 12' N$ . (8)

15.a.i) Define the three point problem. Explain any one method of solving it. (6)

ii) Write down the Kepler's law of Planetary Motions (5)

iii) What is spherical excess? Also write its maximum and minimum values. (5)

(Or)

15. b Write short note on any four of the following

i) Strength of FIX ii) Trilateration iii) 3. Measurement of current and discharge of large river

iv) Star constellations v) Napier rule of circular parts vi) Declination of the sun and ecliptic.

vii) Equation of TIME viii) Cadastral Surveying (16)