

S.Y. B. Tech Civil Engg.

Surveying and Levelling (CED-202)

Q.1 (a) R.F = $\frac{1}{1000}$, Scale 1 cm = 10 m - 2 marks

(b) To hold the rear end of the chain
To instruct and range leader
collect the arrows fixed by leader } any Two 2 marks

(c)

$\angle QPR = \text{FB of } PQ + \text{FB of } PR$
 $= 35^\circ 45' + 20^\circ 30'$
 $= 56^\circ 15'$

Sketch - 1 Mark
 Answer - 1 Mark

(e) Backsight, Through compass - 1 Mark each

(d)

Angle $\neq 120^\circ$
 $\neq 30^\circ$

Angle $< 30^\circ$
 $> 120^\circ$

Well conditioned : No angle less than 30° & greater than 120°
 ill conditioned : angles ~~are~~ greater than 120° & smaller than 30°

(f)

vertical cliff

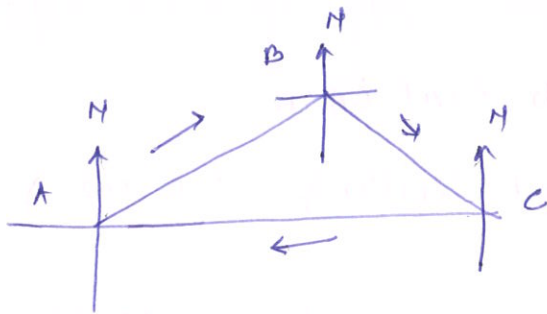
100m

102m 104m

(h)

Main scale reading $150^\circ 40'$ — 1 Mark
 Vernier scale reading $19' 40''$ — 1 Mark
 $150^\circ 59' 40''$

Q.2 (a)



Sketch - 2 Marks

BB - 2 Marks

Angles - 2 Marks

Check - 2 Marks

Line	FB	BB
AB	60°	240°
BC	130°	310°
CA	270°	90°

$$\angle A = \text{BB of CA} - \text{FB of AB}$$

$$= 90^\circ - 60^\circ = 30^\circ$$

$$\angle B = \text{BB of AB} - \text{FB of BC}$$

$$= 240^\circ - 130^\circ = 110^\circ$$

$$\angle C = \text{BB of BC} - \text{FB of CA}$$

$$= 310^\circ - 270^\circ = 40^\circ$$

Check: $(2N-4) \times 90^\circ = 180^\circ$
 $N = 03$

$$\angle A + \angle B + \angle C = 180^\circ 00' 00''$$

(b) Defⁿ - 1 Mark, Detection - 3 Marks

(c) Methods - 2 Marks, Appropriate method - Radiation,
 Sketch - 2 Marks, procedure - 3 Marks.

Declination - 1 Mark, East declination - 1 Mark

West declination - 1 Mark, Sketch 1 Mark

Q.3 (a) Radiation, intersection, traversing - 2 Marks
 Radiation - 1 Mark, sketch - 2 Marks, procedure - 3 Marks

(b) sketch - 1 Mark, procedure - 3 Marks

(c) Merits - 2 Marks, Demerits - 2 Marks

Q.4 (a) statements of characteristics - 1 Mark each
 Sketch showing R.L.'s - 1 Mark each

(b) Indirect contouring - 2 Marks
 Two Methods - 3 Marks each

Q.5 (a)

Table with correct entries = 2 Marks
 correct R.L. = 2 Marks
 correct Rise = 1 Mark
 correct Fall = 1 Mark

check = 2 Marks

Sr. No. of Stn.	B.S.	I.S.	F.S.	Rise	Fall	R.L.	Remarks
1	1.425					100.00	BM
2		2.360			0.935	99.065	
3		1.855		0.505		99.570	
4		2.650			0.795	98.775	
5		3.805			1.155	97.620	
6		2.115		1.690		99.310	
7			1.310	0.805		100.115	Last station
SUM	1.425		1.310	3.000	2.885		

Arithmetic Check:

$$\sum B.S. - \sum F.S. = \sum Rise - \sum Fall = Last R.L. - First R.L.$$

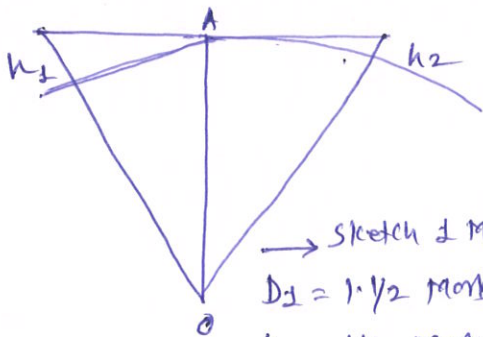
$$1.425 - 1.310 = 3.000 - 2.885 = 100.115 - 100.00$$

$$+ 0.115 = + 0.115 = + 0.115$$

Q.5 (b) 1 Mark for each detⁿ.

(OR)

(c)



Sketch 1 Mark

D1 = 1 1/2 Marks
 D2 = 1 1/2 Marks

h_1 = height of light house above sea level = 35 m

h_2 = height of observers eye = 6 m

D_1 = Distance of the point of tangency from lighthouse, km

D_2 = dist. of the point of tangency from observers eye

$$h_1 = 0.0673 D_1^2$$

$$D_1 = \sqrt{\frac{h_1}{0.0673}}$$

$$= \sqrt{\frac{35}{0.0673}}$$

$$= 22.81 \text{ km}$$

$$h_2 = 0.0673 D_2^2$$

$$D_2 = \sqrt{\frac{h_2}{0.0673}}$$

$$= \sqrt{\frac{6}{0.0673}}$$

$$= 9.44 \text{ km}$$

Distance betⁿ observer & light house
 = $D_1 + D_2$
 = $22.81 + 9.44$
 = 32.25 km

Q.6 (a) Sketch 1 Mark, procedure - 3 Marks

(b) 1 Mark for each

(OR)

(c) Sketch 1 Mark, procedure - 3 Marks

(d) Sketch 1 Mark, procedure - 3 Marks