

5E5064	Roll No. _____	Total No of Pages: 4
5E5064		
B. Tech. V Sem. (Main/Back) Exam., Nov.-Dec.-2016		
Civil Engineering		
5CE4A Surveying - II		

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks Main: 26

Min. Passing Marks Back: 24

Instructions to Candidates:

Attempt any five questions, selecting one question from each unit. All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

(Mentioned in form No. 205)

1. NIL _____

2. NIL _____

UNIT - I

Q.1 (a) Explain the method to determine reduced level of top of a chimney, when two instrument positions are not in the same vertical plane of the chimney. Also derive related expression for computations. [8]

(b) Find the R. L. of Q from the following observations: [8]

Horizontal distance between P & Q – 8300 m

Angle of elevation from P to Q – 2° 6' 18"

Height of signal at Q – 3.96 m

Height of Instrument at P – 1.45 m

Co-ff of refraction – 0.07

R Sin 1" – 30.88 m

R. L. of P – 400 m

OR

- Q.1 (a) Derive necessary expression for axis signal correction in trigonometric leveling. [10]
- (b) To find the elevation of the top, a flag-staff (Q) of 2 m height was erected and observations were made from two station P and R, 60m apart. The horizontal angle measured at P between R and top of flag staff (Q) was $60^{\circ} 30'$ and that measured at R between top of flag staff (Q) and P was $68^{\circ} 18'$. The angle of elevation to the top of the flag (Q) staff measured to be $10^{\circ} 12'$ at P and at R to be $10^{\circ} 48'$. Staff reading on B. M. when the instrument was at P = 1.96m and that with instrument at R = 2.05m. Compute the R. L. of top of flag staff if RL of B.M. is 235.00m [6]

UNIT - II

- Q.2 (a) Explain the function & requirements of transition curves. Also enumerate the empirical methods of computing the length of transition curve and explain at least one method. [8]
- (b) A simple circular curve is to be set-out by the method of perpendicular offset from long chord. If radius of curve is 30m and deflection angle in 60° , compute perpendicular offsets at 2.5m interval including mid point. [8]

OR

- Q.2 (a) Compute the distance between two parallel straight between which the reverse curve has been provided. The radius of two arcs R_1 & R_2 and central angle D_1 & D_2 are known. Any suitable condition required may be assumed. [8]
- (b) A simple circular is to be set out by Rankine's tangential angle method. If radius of curve is 240 m, deflection angle 40° and chainage of point of intersection is 1260m, find [8]
- (i) chainage of point curve (T_1)
 - (ii) first tangential angle
 - (iii) last tangential angle

(iv) intermediate tangential angle if normal chord length is 20m

UNIT - III

Q.3 (a) Explain what do you understand by well conditioned triangle. Derive condition for well conditioned triangle. [8]

(b) Write different criterions for selection of a triangulation station. [8]

OR

Q.3 Two stations A & B are 100km apart. The elevation of A is 185m and B is 885m. In the line of sight between A & B, there are two intervening peaks C and D. C is 42km from A and D is 81km from A. The elevations of peak C & D are 318m and 750m respectively. Check whether the two stations A & B are intervisible or not. If not, find height of signal at B so that line of sight remains at least 3m above the ground surface. [16]

UNIT - IV

Q.4 (a) Explain following with example-

(i) Observation equation [2]

(ii) Condition equation [2]

(iii) Residual Error [2]

(iv) True Error [2]

(b) It three angles of a triangle are-

A = 77° 14' 20" wt - 4

B = 49° 40' 35" wt - 3

C = 53° 04' 52" wt - 2

find corrected values of angle by using method of correlates. [8]

OR

- Q.4 (a) Write Laws of weights with suitable examples. [8]
- (b) A line of levels is run from BM at A to BM at E connecting intermediate points B, C and D enroute. The observed data are as given below-

Section	Distance (km)	Observed Difference in elevation (m)
A to B	2	- 1.45
B to C	3	+ 0.83
C to D	6	- 2.42
D to E	4	+ 1.83

Calculate corrected elevation of B, C, & D if RL of A and E are 100.00 and 98.64m respectively. [8]

UNIT – V

- Q.5 (a) Explain Astronomical triangle, its components and applications. [8]
- (b) Explain Napier's Rule for star at elongation. [8]

OR

- Q.5 (a) Explain method of determining the Azimuth by ex-meridian observation on the sun. [12]
- (b) Explain principle of electronic distance measurement. [4]