

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. NIL2. 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-eff 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. rtuonline.com [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 criteria 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 = $77^{\circ} 14' 20''$ wt - 4

B = $49^{\circ} 40' 35''$ wt - 3

C = $53^{\circ} 04' 52''$ 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]
