Roll No. _____ [Total No. of Pages : 3

5E5064

5E5064

B.Tech. V Semester (Main/Back) Examination, Nov./Dec, - 2017
Civil Engineering
5CE4A Surveying - II

Time : 3 Hours

Maximum Marks : 80
Min. Passing Marks : 26

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 suitable be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Unit - I

1. a) Explain how will you determine reduced level of top of a chimney, when two instrument positions are not in same vertical plane of the chimney. Also derive related expression? (8)

   b) Following reciprocal observations were made from two stations P and Q.

   Horizontal distance between two stations = 7000m

   Angle of elevation from P to Q - 1°58'20"

   Angle of depression from Q to P - 1°59'12"

   Height of signal at P - 4.1047 m

   Height of instrument at Q - 1.58 m

   Height of signal at Q - 3.90 m

   Height of instrument at P - 1.47 m

   Find the difference in level between P and Q. Take R sin i" = 30.88 m. (8)

OR

1. a) Explain how will you determine the elevation difference between two stations by single observation. Derive expression for Elevation difference for angle of elevation. Support your answer with proper and neat sketch. (8)

   b) Derive expression for axis signal correction in trigonometric levelling for angle of elevation? (8)

Unit - II

2. a) Enumerate the methods of setting out simple circular curve. Explain the method perpendicular offset from long chord to set out simple circular curve? (8)

   b) Two tangents intersects at a chainage 1190 m, the deflection angle being 36°. Calculate necessary data for setting out simple circular curve by Rankine's tangential angle method. The radius of curve is 300 m, take normal chord length as 20 m. (8)

OR

2. a) Explain methods of computing length of transition curve? (8)

   b) Two straights AB and BC are connected by compound curve. If deflection angle of first curve is $40°30'$ and second curve is $36°24'$ respectively. The radius of first curve is 600 m and that of second curve is 800 m. If the chainage of intersection point is 8200 m, find the chainage of tangent points T_1 and T_2 and point of compound curvature. (8)

Unit - III

3. a) What do you understand by well conditioned triangle? What is the importance of a well conditioned triangle in triangulation? Derive the condition for a well conditioned triangle? (8)

   b) Write different criterions for selection of a triangulation station? (8)

OR

3. a) What is the necessity of a satellite station in the triangulation? How reduction to centre is done if satellite station is selected in triangulation network? (8)

   b) Two triangulation stations A and B are 100 km apart having elevations 180 m and 450 m respectively. The intervening obstruction situated at C is 70 km from A, has elevation 245m. Ascertain if A and B are intervisible or not. If A and B are not visible then find the height of signal at B so that the line of sight must no where be less than 3 m above ground surface. (8)

Unit - IV

4. a) Explain the following with examples: (8)

   i) Accidental errors.

   ii) Systematic errors.

   iii) Weight of an observation.

   iv) Station Adjustment.

   b) What do you understand by figure adjustment? Adjust Braced quadrilateral by method of least square, write condition equations? (8)

4. a) What do you understand by weight of a quantity? Explain the laws of weights with suitable examples? (8)

b) Find the most probable values of angles A and B from following observation: (8)

$A = 42°20'30.4'' - wt. -1$
$B = 36°18'25.2'' - wt. -2$
$A + B = 78°38'50.3'' - wt. -3$

Unit - V

5. a) Enumerate the different astronomical co-ordinate systems. Explain one of them in detail. (8)

b) Explain what do you understand by declination? Show the variation of declination of sun with salient values and specific dates? (8)

OR

5. a) Explain the Astronomical Triangle? (8)

b) Calculate the sun's azimuth and hour angle at a place in latitude 42°30'N, when its declination is (8)

i) 22°12'N and

ii) 22°12'S

❖❖❖❖

5E5064 (3)