Reg. No. :

Question Paper Code: 41146

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Fourth Semester

Civil Engineering

14UCE406 - SURVEYING -II

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. If R is the radius of the main curve, θ the angle of deflection, S the shift and L the length of the transition curve, then, total tangent length of the curve, is

   (a) $(R - S) \tan \theta/2 + L/2$ (b) $(R + S) \tan \theta/2 - L/2$

   (c) $(R - S) \tan \theta/2 - L/2$ (d) $(R + S) \tan \theta/2 + L/2$

2. An ideal vertical curve to join two gradients, is

   (a) parabolic   (b) circular   (c) elliptical   (d) hyperbolic

3. Primary triangulation

   (a) triangulation consists of a number of points fixed within the framework of primary triangulation
   (b) employed either to determine the earth's figure or to furnish the most precise control points
   (c) triangulation consists of a number of points fixed within the framework of secondary triangulation
   (d) The sizes of the triangles are small and instrument with moderate precision may be used

4. The setting of points in the vertical direction is usually done

    (a) Boning rods and travellers   (b) Sight Rails

    (c) Slope rails or batter boards   (d) all the above

5. Systematic Error

    (a) it produces a serious effect on the final result

    (b) error that under the same conditions will always be of the same size and sign

    (c) errors that arise from inattention, inexperience, carelessness and poor judgment

    (d) all the above

6. Tachometric surveying
    (i) Tachometry is the branch of Surveying in which we determine the horizontal and vertical distances with the angular measurements with an instrument
    (ii) It is generally used to locate contours, hydrographic surveys and laying out routes of highways, railways etc

    (a) (i) is Correct   (b) (ii) is correct

    (c) (i) and (ii) are correct   (d) (i) and (ii) are wroung

7. The instrument required for carrying out the tachometric survey

    (a) stadia rod   (b) telescope   (c) ranging rod   (d) vertical staff

8. Zenith is

    (a) imaginary point directly "below" a particular location

    (b) imaginary point directly "above" a particular location

    (c) imaginary point directly "proportionate " a particular location

    (d) all the above

9. Latitude is

    (a) angles that uniquely define points on a sphere

    (b) angles that equally define points on a sphere

    (c) angles that uniquely define points on a meridian

    (d) angles that uniquely define points on a north pole

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10. solar apparent time

   (a) calculation of the passage of time based on the Sun's position in the sky
   (b) calculation of the day time based on the Sun's position in the sky
   (c) calculation of the normal time based on the Sun's position in the sky
   (d) all the above

PART - B (5 x 2 = 10 Marks)

11. What is degree of curve?

12. What is meant by satellite station?

13. Differentiate between most probable error and residual error.

14. What are the error sources of total station?

15. State the necessity of hydrographic surveys.

PART - C (5 x 16 = 80 Marks)

16. (a) List the various methods of setting out a simple circular curve. Explain briefly the Rankine method of deflection angles. (16)

Or

   (b) Summarize briefly the procedures for setting out compound curve. (16)

17. (a) (i) How the triangulation systems are classified? Illustrate their specifications. (8)

   (ii) Calculate sag correction for a 30 m steel under a pull of 100 N in three equal spans of 10 m each. Weight of one cubic cm of steel = 0.078 N. Area of cross section of tape = 0.08 $sq.cm$. (8)

Or

   (b) (i) From a satellite station S, 5.8 m from main triangulation station A, the following directions were measured. $A = 0^0\ 0'\ 0"$; $B = 132^0\ 18'\ 30"$; $C = 232^0\ 24'\ 06"$; $D = 296^0\ 06'\ 11"$; $AB = 3265.5\ m$; $AC = 4020.2\ m$; $AD = 3086.4\ m$. Predict the directions of AB, AC and AD from the above given data. (10)

   (ii) Explain the intervisibility of triangular station? (6)

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18. (a) Examine the most probable values of the angles *A, B, C* from the following observations at a station P.

   $A = 38° 25' 20"$ Weight 1

   $B = 32° 36' 12"$ Weight 1

   $A+B = 71° 01' 29"$ Weight 2

   $A+B+C = 119° 10' 43"$ Weight 1

   $B+C = 80° 45' 28"$ Weight 2   (16)

Or

   (b) (i) Explain the general principles of least squares.   (6)

   (ii) Analyse the following given angles closing the horizon at a station and adjust it.

   $A = 1220 05'58.9"$ Weight 1

   $B = 860 45' 16.4"$ weight 1

   $C = 720 50'31.2"$ weight 3

   $D = 780 18' 16.6"$ weight 1   (10)

19. (a) List the components of total station? Describe them briefly and also tell about its care and maintenances.   (16)

Or

   (b) Illustrate the working principle and measuring principle of electro optical surveying (Total Station) with neat sketches.   (16)

20. (a) *A, B* and *C* are three visible stations in a hydrographical survey. The computed sides of the triangle *ABC* are: *AB*, 1130 *m* ; *BC*, 1372 *m* ; *CA*, 1889 *m*. Outside this triangle (and nearer to *AC*), a station P is established and its position is to be found by three point resection on *A, B* and *C*, the angles *APB* and *BPC* being respectively 420 35' and 540 20'. Calculate the distances *PA* and *PC*.   (16)

Or

   (b) Discuss the types of celestial co-ordinate systems.   (16)

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