Reg. No. : | | | | | | | | | | |

Question Paper Code: 41416

B.E. / B.Tech. DEGREE EXAMINATION, MAY 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. When the centres of the arcs lie on the opposite sides of the common tangent at the junction of the two curves, it is known as a

   (a) simple curve (b) vertical curve
   (c) compound curve (d) reverse curve

2. When R is the radius of the curve (in metres), D is the degree of curve (in degrees) and length of the chord is 30 m, then the relation between R and D is

   (a) $R = 1520/D$ (b) $R = 1720/D$ (c) $R = 4500/D$ (d) $R = 5400/D$

3. The operation of making the algebraic sum of latitudes and departures of a closed traverse, each equal to zero, is known as

   (a) balancing the sights (b) balancing the departures
   (c) balancing the latitudes (d) balancing the traverse

4. For a well-conditioned triangle, no angle should be less than

   (a) 20° (b) 30° (c) 45° (d) 60°

5. The point on the celestial sphere vertically below the observer's position, is called

(a) zenith (b) celestial point (c) nadir (d) pole

6. The shortest distance between two places measured along the surface of the earth, is.

(a) length of the equator between their longitudes
(b) length of the parallel between their longitudes
(c) length of the arc of the great circle passing through them
(d) none of these

7. If the image of a triangulation station of R.L. 500 *m* is 4 *cm* from the principal point of a vertical photo taken from an altitude of 2000 *m*, above datum, the height displacement will be

(a) 2 *mm* (b) 4 *mm* (c) 6 *mm* (d) 10 *mm*

8. Most advanced surveying instrument is

(a) Theodolite (b) Tachometer (c) Total station (d) Dumpy level

9. Pick up the correct statement from the following

(a) Box sextant is used for the measurement of horizontal angles
(b) Cross staff is used for setting out right angles
(c) Gradiometer is used for setting out any required gradient
(d) All the above

10. Hydrographic surveys deal with the mapping of

(a) large water bodies (b) heavenly bodies
(c) mountainous region (d) canal system

PART - B (5 x 2 = 10 Marks)

11. Differentiate between horizontal and vertical curves.

12. What are the objectives of triangulation survey?

13. Define the most probable value.

14. Explain carrier waves in EDM.

15. What is M.S.L?

PART - C (5 x 16 = 80 Marks)

16. (a) Two straights *AB* and *BC* intersect at a chainage of 4242.00 *m*. The angle of intersection is 140°. It is required to set out a 5° simple circular curve to connect the straights. Calculate all the data necessary to set out the curve by the Rankine's method of deflection angles and tabulate the results. (16)

Or

(b) (i) Explain two Theodolite method of setting out simple curve. (8)

(ii) Explain the different elements of a simple curve with neat sketch. (8)

17. (a) (i) Describe the satellite station and process of reduction to centre? (10)

(ii) Show the expression for reducing the angles measured at the satellite station to centre. (6)

Or

(b) (i) How the triangulation systems are classified? Explain in detail. (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)

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) Explain in detail to determine the most probable value by the method of correlates. (16)

19. (a) (i) Explain briefly the electro optical and microwave EDM system? (8)

(ii) Explain the working principle of EDM? (8)

Or

(b) (i) Explain briefly the types of total station. (8)

(ii) Discuss the different sources of errors which are encountered in a total station. (8)

20. (a) What do you mean by soundings? Describe briefly the various methods of locating soundings in hydrographic surveying? (16)

Or

(b) (i) Explain any two celestial coordinate system with neat diagrams. (8)

(ii) Determine the hour angle and declination of a star from the following data.

Altitude of the star = 21° 30'

Azimuth of the star 140° *E*

Latitude of the observer 48° *N* (8)

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