

B.Tech 5th Semester Exam., 2018

ADVANCED SURVEYING

Time : 3 hours

Full Marks : 70

Instructions :

- (i) All questions carry equal marks.
 (ii) There are **NINE** questions in this paper.
 (iii) Attempt **FIVE** questions in all.
 (iv) Question No. 1 is compulsory.

1. Choose the correct answer (any seven) :

- (a) What is the curvature correction for a distance of 1000 m?
 (i) 0.0785 m
 (ii) 78.50 m
 (iii) 67.03 m
 (iv) 0.0673 m

- (b) Reciprocal levelling eliminate the effect of
 I. mistakes in staff reading
 II. errors due to collimation line
 III. errors due to atmospheric refraction
 IV. errors due to earth's curvature
 Choose the correct option.

- (i) I and II
 (ii) I, II and III
 (iii) I, III and IV
 (iv) III and IV

- (c) Generally the transition curve used in highways is

- (i) cubic parabola
 (ii) cubic spiral
 (iii) clothoid
 (iv) Bernoulli's lemniscate

- (d) The reference plane in the altitude and azimuth system of coordinate is

- (i) equatorial
 (ii) prime vertical
 (iii) horizontal
 (iv) None of the above

(3)

- (e) The line of Indian standard time passes through
- (i) Kanpur
 - (ii) Bhopal
 - (iii) Gujarat
 - (iv) Allahabad
- (f) 1° latitude is equivalent to a distance of
- (i) 105 km
 - (ii) 111 km
 - (iii) 405 km
 - (iv) 587 km
- (g) In triangulation, the tower used is known as
- (i) heliotrope
 - (ii) hunter
 - (iii) bibly
 - (iv) None of the above
- (h) An equation of weight K is added to constant C . The weight of resulting equation is
- (i) K
 - (ii) $K + C$
 - (iii) K / C
 - (iv) KC

(4)

- (i) The radius of circular curve is 5 times the length of transition curve. The spiral angle is
- (i) 0.1 rad
 - (ii) 0.01 rad
 - (iii) 0.2 rad
 - (iv) 0.05 rad
- (j) The radius of a simple circular curve is 400 m and 120° deflection angle. The mid ordinate is
- (i) 400 m
 - (ii) 600 m
 - (iii) 200 m
 - (iv) 800 m
2. (a) List the various methods of setting out a simple circular curve. Explain briefly the Rankine method of deflection angles.
- (b) What is transition curve? State the various types of transition curves with the help of a neat sketch. Explain briefly its necessity.
3. What is compound curve? A compound curve is composed of two arc of radii 305 m and 520 m, the resulting deflection angle due to the combined curve is 110° and due to first arc of radius 305 m is 50° . If chainage of first point is 5056.5 m, then find the chainages of other salient points.

(5)

- ✓ 4. (a) Explain the methods of locating the soundings.
- (b) What is hydrographic surveying? Explain its use in surveying.
5. Explain the procedure of reciprocal levelling. In levelling between the two points *A* and *B* on opposite banks of a river, the level was set up near *A* and the staff readings on *A* and *B* were 2.150 m and 3.565 m, respectively. The level was then moved to *B* and the respective staff readings on *A* and *B* were 1.965 m and 3.260 m. Find the true difference in levels *A* and *B*.
6. How do you determine the inter-visibility of triangulation station? Two triangulation stations *A* and *B* are 40 km apart and have elevations of 178 m and 175 m respectively. Find the minimum height of signal required at *B* so that line of sight may not pass nearer the ground than 3 m. The intervening ground may be assumed to have a uniform elevation of 150 m.
7. (a) Explain the method for determination of time.
- (b) Explain the terms celestial sphere, celestial poles, celestial equator.

(6)

8. (a) Explain the difference between infra-red EDM and microwave EDM.
- (b) Find the most probable error and most probable value of an area of a circle of radius (10.05 ± 0.02) m.
9. Write short notes on any four of the following :
- ✓(a) Summit and valley curves
- (b) Determination of latitude
- ✓(c) Use of total station
- ✓(d) Laws of weight
- (e) Curvature and refraction correction
- ✓(f) Three-point problem
