

(b) Explain the following terms :

- (i) Independent quantity
- (ii) Direct observation
- (iii) Indirect observation
- (iv) Weight of an observation

8. What is the three-point problem in hydrographic surveying? What is the main purpose for which it is carried out? Show with the help of neat sketches how it is solved, mechanically and graphically.
9. Determine the coordinates of the position of a ship Z , an observer in the ship measured the angles of the stations A , B and C located on the seashore. Angle $A\theta B = 62^\circ 20' 00''$ and angle $BOC = 40^\circ 30' 00''$. The ship was south of the station at time of observation. The coordinates of the stations A , B and C were as follows :

Station	Latitude	Departure
A	0	0
B	500 N	1000 E
C	300 N	1500 E

B.Tech 5th Semester Exam., 2015

ADVANCE 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 of the following (any seven) :

(a) The relief displacement of a minar 72 m high on photograph is 7.2 mm and its top appears 10 cm away from principal point. The flying height of the camera is

- (i) 2000 ft
- (ii) 1500 ft
- (iii) 500 ft
- (iv) 1000 ft

(2)

- (b) While making astronomical observations, the observer is mainly concerned with
- (i) the direction of the vertical, the axis of rotation of the instrument
 - (ii) the direction of the star from the instrument
 - (iii) the direction of the poles of the celestial sphere
 - (iv) All of the above
- (c) The most convenient coordinate system for specifying the relative positions of heavenly bodies on the celestial sphere is
- ✓(i) declination and hour angle system
 - (ii) declination and altitude system
 - (iii) altitude and azimuth system
 - (iv) declination and right ascension system
- (d) Perspective centre relates to
- (i) orthogonal projection
 - (ii) parallel projection
 - ✓(iii) central projection
 - (iv) None of the above

(3)

- (e) The point where vertical line passing through the perspective centre intersects the plane of the photograph, is known as
- (i) plumb point
 - (ii) photo plumb point
 - ✓(iii) nadir point
 - (iv) isocentre
- (f) The principal plane contains
- (i) principal point
 - ✓(ii) principal axis and principal line
 - (iii) isocentre
 - (iv) All of the above
- (g) Triangulation surveys are carried out for locating
- (i) control points for surveys of large areas
 - (ii) control points for photogrammetric surveys
 - (iii) engineering works, i.e., terminal points of long tunnels, bridge abutments, etc.
 - ✓(iv) All of the above

(h) The circle in which a plane tangent to the earth's surface at the point of observation, intersects the celestial sphere, is called

- (i) true horizon
- (ii) visible horizon
- (iii) sensible horizon
- (iv) celestial horizon

(i) In field astronomy, the quantities observed are entirely

- ✓ (i) angles
- (ii) lengths
- (iii) heights
- (iv) All of the above

(j) The angle between the axis of earth and the vertical at the station of observation is called

- (i) declination of star
- (ii) astronomical latitude
- ✓ (iii) astronomical colatitude
- (iv) codeclination of star

2. Briefly explain the classification of circular curve. Write the name of the various parts of a curve with diagram.

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(Continued)

3. ✓ A simple circular curve is to have a radius of 573 m. The tangent intersects at chainage 1060 m and the angle of intersection is 120° . Find (a) tangent distance, (b) chainage at beginning and end of the curve, (c) length of long chord and (d) degree of the curve.

4. ✓ The angles of a triangle ABC were recorded as follows :

$$\begin{aligned} A &= 70^\circ 14' 20'' \text{ weight } 4 \\ B &= 49^\circ 40' 35'' \text{ weight } 3 \\ C &= 53^\circ 04' 52'' \text{ weight } 2 \end{aligned}$$

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Give the correct value of the angle.

5. Explain the procedure of measurement of horizontal distance by electronic distacometer (EDM). State the four uses of total station. 5

6. The altitudes of two proposed stations A and B are 100 km apart are respectively 400 m and 700 m. The intervening obstruction situated at C, 70 km apart from A has an elevation of 478 m. Ascertain, if A and B are intervisible, and if necessary, find by how much B should be rise so that line of sight must nowhere be less than 3 m above the surface of ground.

7. ✓ (a) What do you mean by a weight of an observation? State the rule of assigning weight to the field observation.