

UNIT II – COMPASS SURVEYING

1. Distinguish between angle and bearing? (May / June 2012)

- An angle is defined as the deviation of one straight line with respect to the other one.
- Bearing is defined as the angle (or) inclination of a survey line with respect to the north-south direction.

2. Define true meridian. (Nov/Dec 2012) (Nov/Dec 2010)

- True meridian (or) Geographical meridian is defined as the line joining the geographical north and south poles. True meridian at various places are not parallel to each other.

3. What is magnetic meridian? (Nov/Dec 2009)

- Magnetic Meridian is defined as the longitudinal axis, indicated by the freely suspended, properly balanced magnetic needle. It does not coincide with the true meridian except in certain places during the year.

4. Define Local Attraction

- The deflection of the magnetic needle from its normal position due to attraction of magnetic materials such as magnetic rocks, iron ores, electrical cables etc., is called Local Attraction.

5. What are sources of local attractions? (Nov/Dec 2006)

- ✓ Magnetic materials such as magnetic rocks, iron ores, electrical cables etc., are sources of local attractions.

6. If the magnetic bearing of a line AB is $134^{\circ}45'$, find its true bearing if the magnetic declination is $10^{\circ}15'$. (Apr/May 2008)

$$\begin{aligned}\text{True Bearing} &= \text{Magnetic Bearing} + \text{Declination} \\ &= 134^{\circ}45' + 10^{\circ}15' \\ &= 145^{\circ}\end{aligned}$$

7. Define the term Dip. (Nov/Dec 2011) (Apr/May 2011)

- ✓ The inclination of the magnetic needle with the horizontal plane is called Dip (or) Angle of Dip. The angle of dip at equator is 0° and it increase when approaching the poles. It becomes 90° at poles.

8. What is Magnetic declination? (Nov/Dec 2010) (Nov/Dec 2012)

- ✓ Magnetic Declination is defined as the horizontal angle between the true north and magnetic north at a place, at the time of observation. The magnetic needle can either be deflecting, towards east (or) west of the true meridian.

9. Define Declination and Dip in compass surveying? (Nov/Dec 2006) (Nov/Dec 200)

- ✓ The inclination of the magnetic needle with the horizontal plane is called Dip (or) Angle of Dip. The angle of dip at equator is 0° and it increase when approaching the poles. It becomes 90° at poles.
- ✓ Magnetic Declination is defined as horizontal angle between the true north and magnetic north at a place, at the time of observation. The magnetic needle can either be deflecting, towards east (or) west of the true meridian.

10. Differentiate between Magnetic declination and Dip? (Nov/Dec 2009)

- ✓ The inclination of the magnetic needle with the horizontal plane is called Dip (or) Angle of Dip. The angle of dip at equator is 0° and it increase when approaching the poles. It becomes 90° at poles.
- ✓ Magnetic Declination is defined as the horizontal angle between the true north and magnetic north at a place, at the time of observation. The magnetic needle can either be deflecting, towards east (or) west of the true meridian.

12. How the surveyor's compass is graduated? (Nov/Dec 2009)

Surveyor's compass is graduated from 0° to 90° from North and South. At North and South $0^{\circ} 0'$ to 90° East and West 90° is marked.

13. Convert the following WCB into RB (a) $112^{\circ}04'$ (b) $339^{\circ}42'$ (Nov/Dec 2009)

- (a) RB of $112^{\circ}04' = 180 - 112^{\circ}04' = S 67^{\circ}56' E$
 (b) RB of $339^{\circ}42' = 360 - 339^{\circ}42' = N 20^{\circ}18' W$

14. Convert the following WCB into RB. (a) $151^{\circ}20'$ (b) $332^{\circ}40'$

(Apr/May 2011)

- (a) RB of $151^{\circ}20' = 180 - 151^{\circ}20' = S 28^{\circ}40' E$
 (b) RB of $332^{\circ}40' = 360 - 332^{\circ}40' = N 27^{\circ}20' W$

15. The bearing of a line PQ is $N 50^{\circ}25' E$. What is its whole circle bearing? (Nov/Dec 2006)

The bearing of given line PQ is $N 50^{\circ}25' E$. It lies in the first quadrant and hence, its whole circle bearing is also $50^{\circ}25'$

16. Convert the following RB into WCB (a) $S 34^{\circ}42' E$ (b) $N 02^{\circ}18' W$

(May / June 2007)

- (a) WCB of $S 34^{\circ}42' E = 180 - 34^{\circ}42' = 145^{\circ}18'$
 (b) WCB of $N 02^{\circ}18' W = 360 - 02^{\circ}18' = 357^{\circ}42'$

17. Differentiate between the fore bearing and back bearing of a line. The fore bearing of a line PQ is $N 28^{\circ} W$. What is its back bearing? (Nov/Dec 2005)

The bearing of a survey line in the direction of the progress of survey is known as Fore Bearing (or) Forward Bearing (FB), and the bearing taken in the opposite direction of the progress of survey is called Reverse (or) Back Bearing (BB).

If the fore bearing of the given line PQ is $N 28^{\circ} W$, its back bearing is $S 28^{\circ} E$.

18. Name some of the accessories used in plane tabling. (May / June 2007)(Nov/Dec 2007)

The following instruments are used in plane tabling.

1. Plane table with tripod stand
2. Alidade (or) Sight Rule
3. Spirit Level
4. Compass
5. Plumbing Fork
6. Drawing Paper

19. Name some of the errors in plane table surveying. (May / June 2006)

Various errors in plane table surveying are classified as follows.

1. Instrumental Errors.
2. Plotting Errors.
3. Manipulation and Sighting errors.

20. What is resection in plan tabling? (May / June 2012)

Resection is defined as the process of locating the plane table station, by back ray method from the plotted station on the sheet. This method is also called Interpolation method (or) Fixing method.

1. Back ray method
2. Two point Problem method
3. Three point Problem method
4. A box compass method.

21. What is Two-Point Problem? (May / June 2013)

Two-Point problem is defined as the process of locating the plane-table station on the sheet, by sighting two well-defined points and its locations are already plotted on the paper.

22. Define Three-Point Problem? (Nov/Dec 2005) (May / June 2009)

Three point problems is defined as the process of locating the plane table station on the sheet by sighting three well defined points and its locations are already plotted on the paper.

23. When is plane table surveying opted? (Nov/Dec 2006)

- ✓ Plane table surveying suitable,
- When the time required to survey the area in the field is comparatively high
 - Where higher accuracy is not required.
 - For small scale maps
 - For magnetic areas, where a compass survey is not reliable.

25. What is the use of trough compass in plane table surveying? (Nov/Dec 2012)

A trough compass in plane table surveying is used for orienting the plane table to the magnetic north. The edge of the compass box is perfectly straight and the bottom is perfectly flat. A line along the edge of the compass is drawn, which defines the magnetic north.