POSTAL
Book Package
2021

CIVIL ENGINEERING

Surveying and Geology

Objective Practice Sets	*Contents*

MADE EASY
Publications

Compass Surveying

Q.1 Local attraction in compass surveying may exist due to
(a) incorrect levelling of the magnetic needle
(b) loss of magnetism of the needle
(c) friction of the needle at the pivot
(d) presence of magnetic substances near the instrument

Q.2 The horizontal angle between the true meridian and magnetic meridian at a place is called
(a) azimuth
(b) declination
(c) local attraction
(d) magnetic bearing

Q.3 A negative declination shows that the magnetic meridian is to the
(a) eastern side of the true meridian
(b) western side of the true meridian
(c) southern side of the true meridian
(d) none of the above

Q.4 If the quadrantal bearing of a line is N25°W, then the whole circle bearing of the line is
(a) S 25°E   (b) 205°
(c) 335°   (d) 295°

Q.5 If fore bearing of a line is S49°52′E (assuming there is no local attraction), the back bearing of the line will be
(a) S 52°49′E   (b) S 49°52′E
(c) N 49°08′E   (d) N 49° 52′W

Q.6 What is the magnetic declination at a place if the magnetic bearing of the sun at noon is 184°
(a) 4°W   (b) 4°E
(c) 176°W   (d) 176°E

Q.7 The magnetic bearing of a line is 48°32′. If the magnetic declination is 8°02′ east, then the true bearing of the line is

Q.8 Which one of the following figures indicates the principle of traversing?
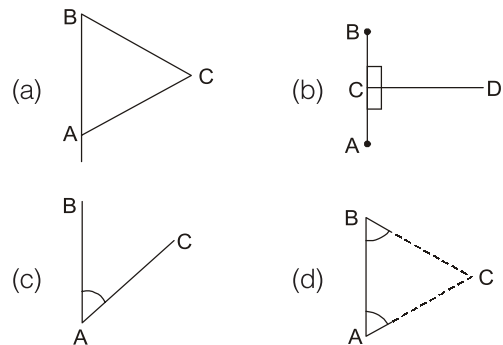
Q.9 In the prismatic compass
(a) the magnetic needle moves with the box
(b) the line of the sight does not move with the box
(c) the magnetic needle and graduated circle do not move with the box
(d) the graduated circle needle always remains in the N-S direction

Q.10 The temporary adjustments of a prismatic compass are
1. Centering
2. Levelling
3. Focussing the prism
The correct order is
(a) 1, 3 and 2   (b) 1, 2 and 3
(c) 2, 3 and 1   (d) 3, 1 and 2

Q.11 As compared to mirror stereoscope, lens stereoscope
1. causes less strain to the eyes of the user
2. is small in size
Of these statements
(a) Only 1 is correct
(b) Only 2 is correct
(c) Both 1 and 2 are correct
(d) Both 1 and 2 are incorrect

Directions : Each of the next items consists of two statements, one labelled as 'Statement (I)' and the other as 'Statement (II)'. Examine these two statements

carefully and select the answers to these items using the codes given below:

Codes:
- (a) Both Statement (I) and Statement (II) are individually true; and Statement (II) is the correct explanation of Statement (I)
- (b) Both Statement (I) and Statement (II) are individually true; but Statement (II) is NOT the correct explanation of Statement (I)
- (c) Statement (I) is true; but Statement (II) is false
- (d) Statement (I) is false; but Statement (II) is true

Q.12 Statement (I): If a place is in the western hemisphere, the magnetic needle will be to the west of the geographical meridian. If the place is in the eastern hemisphere, the needle will be to the east of the geographical meridian

Statement (II): The magnetic needle does not remain on one side of the geographical meridian. It varies from place to place.

Q.13 Statement (I): The meridian distance of any line is equal to the meridian distance of its midpoint

Statement (II): The meridian distance of any line is equal to the meridian distance of the preceding line plus half the departure of the preceding line plus half the departure of the line itself.

Q.14 If the forbearing of a line AB is 35° and that of line BC is 15°, then the included angle between the lines is
- (a) 20°
- (b) 50°
- (c) 160°
- (d) 230°

Q.15 The following bearings were observed while traversing with a compass:

Line	F.B.	B.B
AB	104° 30′	284° 30′
BC	48° 15′	226° 0′
CD	290° 30′	115° 15′
DA	180° 15′	357° 15′

Which stations were affected by local attraction?
- (a) *A* and *B*
- (b) *B* and *C*
- (c) *C* and *D*
- (d) A *and* D

Q.16 If the declination is 5°40′W, which one of the following magnetic bearing would represent the true bearing of S 25° 20′ E?
- (a) S19° 20′E
- (b) S31° 0′E
- (c) S20° 0′E
- (d) S19° 20′W

Q.17 *ABCD* is a regular parallelogram plot of land whose angle *BAD* is 60°. If the bearing of line *AB* is 30° then the bearing of line *CD* is
- (a) 90°
- (b) 120°
- (c) 210°
- (d) 270°

Q.18 The prismatic compass and surveyor's compass
- (a) give Whole Circle Bearing (WCB) of a line and Quadrantal Bearing (QB) of a line respectively
- (b) both give QB of a line and WCB of a line
- (c) both give QB of a line
- (d) both give WCB of a line

Q.19 Agonic line is the line joining points having
- (a) zero declination
- (b) minimum declination
- (c) maximum declination
- (d) same declination

Q.20 Match **List-I** with **List-II** and select the codes given below the lists:

List-I
- A. Diurnal variation
- B. Annual variation
- C. Secular variation
- D. Irregular variation

List-II
1. Declination of a place varies yearly
2. Daily variation of declination at a place
3. Variation of declination at a place varies in different ways at different period
4. "Magnetic storms" and variation is unpredictable

Codes:

	A	B	C	D
(a)	3	1	2	4
(b)	4	1	3	2
(c)	2	1	3	4
(d)	3	1	2	4

Q.21 The direction of the magnetic meridian is established at each traverse station and the direction of the line is determined with reference to the magnetic meridian. This method of traversing is called
- (a) fast needle method
- (b) loose needle method
- (c) bearing method
- (d) fixed needle method

Q.22 The bearings of the lines *AB* and *BC* are 146° 30′ and 68° 30′. The included angle *ABC* is
(a) 102°
(b) 78°
(c) 45°
(d) None of these

Q.23 If the bearing of a line *AB* is S30°40′E and that of BC is N44°E, then the value of interior angle *B* will be
(a) 14°20′
(b) 103°20′
(c) 74°40′
(d) 84°40′

Q.24 Which of the following variations of magnetic declination are correctly matched?
1. Diuranal variation .... Variation whose time period varies from 100-350 years
2. Annual variation .... Annual rate of change of secular variation
3. Secular variation .... Variation declination periodic in character
4. Irregular variation .... Caused due to magnetic storms in earth's magnetic field
Select the correct answer using the codes given below:
(a) 1, 3 and 4
(b) 2 and 3
(c) 1 and 4
(d) 3 and 4

Q.25 In a closed traverse *ABC*, following readings were taken

Line	Fore Bearing	Back Bearing
AB	20°	201°
BC	101°	278°
CA	278°	50°

Station *A* is free from local attraction. Correct bearing of *CB* is _____.

Q.26 A closed compass traverse PQRS is run with a prismatic compass in a clockwise direction:

Line	Fore bearing
PQ	50°
QR	170°
RS	230°
SP	310°

The value of the included angle S is
(a) 360°
(b) –260°
(c) 100°
(d) 50°

Q.27 In an old map a line was drawn to a magnetic bearing of 10°30′, the magnetic declination being

2° East at that time. The magnetic bearing to which the line should be set now if the present magnetic declination is 4°30′ west
(a) 17°
(b) 15°
(c) 10°
(d) 8°

Q.28 The coordinates of two endpoints *A* and *B* of a traverse line *AB* are
X_A = 1000.00 m, Y_A = 10000.00 m
X_B = 2000.00 m, Y_B = 1000.00 m
The bearing of the line *AB* will be
(a) 0°0′ 00″
(b) 60°0′00″
(c) 90°0′ 00″
(d) 180°0′00″

Q.29 Prismatic compass is considered more accurate than surveyor's compass because
(a) It is provided with better magnetic needle
(b) It is provided with a sliding glass in the object vane
(c) Its graduations are in whole circle bearings
(d) It is provided with a prism to facilitate reading of its graduated circle

Q.30 The different variation in magnetic declination at any place are as follows
1. Annual variation
2. Diurnal variation
3. Irregular variation
The correct sequence of their values in ascending order is
(a) 3 < 1 < 2
(b) 2 < 1 < 3
(c) 1 > 2 > 3
(d) 1 > 3 > 2

Q.31 If the sum of Northings of a traverse exceeds the sum of Southings by 1 m and sum of Eastings exceeds the sum of westings by 1 m, the resultant closing error and its true bearing respectively are
(a) 1 m, N45°E
(b) 2 m, N45°W
(c) $\sqrt{2}$ m, N45°E
(d) 0, N45°E

Q.32 Given below are the bearing observed in a traverse survey using prismatic compass at a place where local attraction was suspected
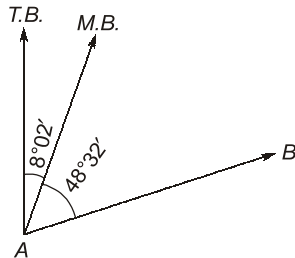
Line	FB	BB
AB	124°30′	304°30′
BC	68°15′	246°00′
CD	310°30′	135°15′
DA	200°15′	17°45′

At what station local attraction are absent and correct *FB* of line *CD* is

6.   (a)
True bearing = Magnetic bearing + Declination
$\therefore 180° = 184° +$ Declination
orDeclination $= -4° = 4°W$

7.   (56.57°)

True bearing = Magnetic bearing + East declination
$$= 48° \, 32' + 8° \, 02'$$
$$= 56° \, 34'$$
$$= 56.57°$$

8.   (a)
The principles of traversing say that, a traverse should consist of a series of straight lines connected together to form an open or a closed polygon. The points defining the ends of the traverse lines are called traverse stations or traverse points.

9.   (c)
Graduated ring remain stationary while box is prism and object vane rotates as the ring attach with needle is not attach with the box.

11. (b)
Mirror stereoscope uses mirrors to bring the two images to the two eyes of the photo interpreter. The main advantage of using this type is that the stereo pair can be completely separately them permitting the analyst to see more of the image at once.

The lens stereoscope is the most basic variety. These makes the image seen through it appear larger and more distant and usually also shifts its apparent horizontal position. It is smaller in size than mirror stereoscope.

14. (c)
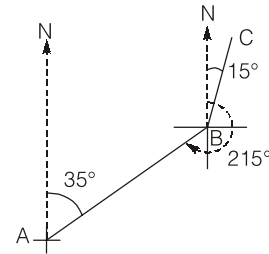
Given:
Forbearing of line $AB = 35°$
$\therefore$ Back bearing of $AB = 180° + 35° = 215°$
$\therefore$ Included angle between the lines,
$360° - (215° - 15°) = 160°$

15. (c)
As the difference between F.B and B.B of line AB is exactly 180°, stations A and B are free from local attraction which is not the case with line CD. Hence stations C and D are affected by local attraction.

16. (b)
Note that negative (W) declination should be added to quadrantal bearing in second and fourth quadrant i.e. NθW or SθE and it should be subtracted from quadrantal bearing in first and third quadrant i.e., NθE and SθW. Reverse should be done for positive (E) declination.
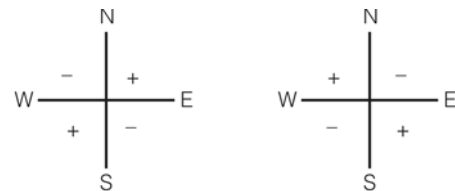
For Positive Declination   For Negative Declination
True bearing = S 25° 20′ E + 5° 40′
$$= S \, 31° \, 0' \, E$$