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	<p style="text-align: center;"><u>LESSON PLAN : MR 5</u> <u>CARDINAL POINTS AND TYPES OF NORTH</u></p> <p>Period - One</p> <p>Type - Lecture/Practice</p> <p>Code - MR-5</p> <p>Term - I</p> <hr/> <p><u>Training Aids</u></p> <p>1. Computer Slides, Pointer, Charts, Black board & Chalk.</p> <p><u>Time Plan</u></p> <p>2. (a) Introduction - 05 Min</p> <p>(b) Cardinal Points and Types of North - 15 Min</p> <p>(c) Magnetic variation and Grid convergence - 15 Min</p> <p>(d) Conclusion - 05 Min</p> <p style="text-align: center;"><u>AIM</u></p> <p>3. The aim of this lecture is to introduce the Cadets to the basics of Map reading and conventional signs.</p> <p style="text-align: center;"><u>PREVIEW</u></p> <p>4. The lecture will be conducted in the following parts:-</p> <p>(a) Part I - Cardinal Points and Types of North</p> <p>(b) Part II - Magnetic variation and Grid convergence</p> <p>(a) <u>PART I: CARDINAL POINTS AND TYPES OF NORTH</u></p> <p><u>Cardinal Points</u></p> <p>6. North, South, East and West are known as the cardinal points.</p> <p>7. If the North point is taken as zero degrees the angle which East forms with it is 90 degrees, or a right angle. The angle formed by the South point, being twice as large, is 180 degrees, and the</p>

West point forms an angle of 270 degrees. If the angle is measured all the way round the circle back again to North, it will be found to be 360 degrees.

8. In addition to four Cardinal Points and four intermediate four major directions, there are eight minor directions. The names and degrees are as under:-

- | | | | |
|-----|------------------|---|-----------------|
| (a) | North North East | - | 22 & ½ Degrees |
| (b) | East North East | - | 67 & ½ Degrees |
| (c) | East South East | - | 112 & ½ Degrees |
| (d) | South South East | - | 157 & ½ Degrees |
| (e) | South South West | - | 202 & ½ Degrees |
| (f) | West South West | - | 247 & ½ Degrees |
| (g) | West North West | - | 292 & ½ Degrees |
| (h) | North North West | - | 337 & ½ Degrees |

Types of North

9. There are three types of North :-

- (a) **True North.** The direction of North pole from the observer.
- (b) **Magnetic North.** It is the point to which a magnetic needle points, when freely suspended.
- (c) **Grid North.** It is the direction to which the North South grid lines on a map point.

Angles Between North Points

Angle between three Norths are as under:-

- (a) **Magnetic Declination.** Angle between Magnetic North & True North, also known as Magnetic Variation.
- (b) **Grid Convergence.** Angle between Grid North & True North.
- (c) **Grid Magnetic Angle.** Angle between Grid North & Magnetic North.

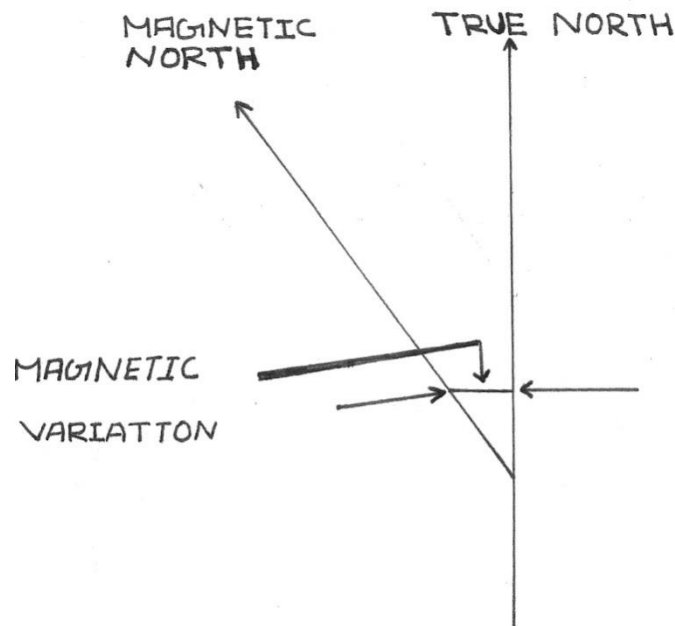
(b)

PART II : MAGNETIC VARIATION AND GRID CONVERGENCE

Magnetic Variation

10. **True North is Constant.** Magnetic North is the point to which the compass needle

points. The needle does not point directly to True North, but a little West or East of True North. The point towards which the needle swings is known as Magnetic North and the difference between True North and Magnetic North is called Magnetic Variation. The amount of the Magnetic Variation depends upon two factors, time and place as at Fig-3 below.



Magnetic Variation

11. **Time.** The Variation is not constant but is, gradually changing and even the change each year is not constant but the difference being negligible it is taken to be constant. On the top margin of a map will be found a statement giving the Magnetic Variation. To bring this up-to-date, the year of issue of the map must be noted and for every year that has passed since then the applicable change annually subtracted or added from the figure given as applicable.

12. **Place.** The amount of the Magnetic Variation also changes in different parts of the world and indeed in different parts of the country.

Grid Convergeance

13. The angular difference between Grid and True NORTH is called the Angle of Convergence or the Grid Convergence.