



4.	<p>On the official data sheet of a benchmark (situated in Alberta) you find the following information :</p> <p><b>Horizontal Datum : NAD83 (updated 93-09-03)</b></p> <p><b>3TMCoordinates</b></p> <p>Scale Factor 0.999900 at Reference Meridian : 114°</p> <p>Northing : 5 794 901.393 m</p> <p>Easting : 13 543.364 m</p> <p>Convergence : 00° 09' 25."32</p> <p>Station Ellipsoid Factor : 0.999864</p> <p>Station Combined Factor : 0.999767</p> <p>a) What are 3TM-coordinates? For a site situated in Canada is the Northing always larger than the Easting? If yes, why?</p> <p>b) What is meant by <i>Convergence</i>. What is its use?</p> <p>c) What is the <i>Scale Factor (at Reference Meridian)</i>, the <i>Station Ellipsoid Factor</i> and the <i>Station Combined Factor</i>? Why are they different? What is their use?</p> <p>d) Make a rough estimation of the latitude of this benchmark. Give your result with a resolution of 1'.</p> <p>e) Make a rough estimation of the longitude of this benchmark. Give your result with a resolution of 1'.</p> <p><i>(just giving numerical results without commenting on how you got it will not be accepted).</i></p>	3 4 8 5 5	
5.	<p>RTK is a broadly used GPS-technique allowing for a rapid determination of coordinates.</p> <p>a) Explain the acronym of RTK. Comment briefly on how it works. What type of GPS observations are used? Which accuracy can be achieved?</p> <p>b) Why are dual frequency measurements mandatory or at least of an enormous benefit compared to single frequency measurements (in RTK)?</p> <p>c) What does PDOP stand for? How is it obtained? What is its use?</p> <p>d) There have been several enhancements and improvements of the traditional RTK approach, like e.g. the use of a virtual reference station. Explain briefly this concept and comment on the infrastructure needed.</p>	8 7 5 5	
<b>Total Marks:</b>		100	