1. a) What do you understand by dietary reference intake? Explain its four nutrient based reference values.

**Ans:** Dietary Reference Intakes (DRIs) are reference values that are quantitative estimates of nutrient intakes to be used for planning and assessing diets for healthy people. They include both recommended intakes and ULs as reference value. Although the reference values are based on data, the data are often scanty or drawn from studies that had limitations in addressing the question. Thus, scientific judgment is required in setting the reference values:

**Uses of Dietary Reference Intakes for Healthy Individuals and Groups.**

<table>
<thead>
<tr>
<th>Reference Value</th>
<th>Description</th>
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<tbody>
<tr>
<td>Recommended Dietary Allowance (RDA)</td>
<td>the average daily dietary intake level that is sufficient to meet the nutrient requirement of nearly all (97 to 98 percent) healthy individuals in a group.</td>
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<tr>
<td>Adequate Intake (AI)</td>
<td>a value based on observed or experimentally determined approximations of nutrient intake by a group (or groups) of healthy people—used when an RDA cannot be determined.</td>
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<tr>
<td>Tolerable Upper Intake Level (UL)</td>
<td>the highest level of daily nutrient intake that is likely to pose no risk of adverse health effects to almost all individuals in the general population. As intake increases above the UL, the risk of adverse effects increases.</td>
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<tr>
<td>Estimated Average Requirement (EAR)</td>
<td>a nutrient intake value that is estimated to meet the requirement of half the healthy individuals in a group.</td>
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**Dietary Reference Intakes (DRIs) are relatively new to the field of nutrition.** The DRIs are a set of at least four nutrient-based reference values that can be used for planning and assessing diets and for many other purposes. They are meant to replace the former Recommended Dietary Allowances (RDAs) in the United States and Recommended Nutrient Intakes (RNIs) in Canada. The DRIs differ from the former RDAs and RNIs in that (1) where specific data on safety and efficacy exist, reduction in the risk of chronic degenerative disease—rather than just the absence of signs of deficiency—is included in the formulation of the recommendation; (2) where data are adequate, upper limits of intake are established to prevent risk of adverse effects; and (3) components of food that may not fit the traditional concept of an essential nutrient but are of possible benefit to health will be reviewed and if sufficient data exist, reference intakes will be established.

Where adequate information is available, each nutrient will have a set of DRIs. A nutrient will have either an Estimated Average Requirement (EAR) and RDA, or an Adequate Intake (AI). When an EAR for the nutrient cannot be determined (and therefore, neither can the RDA), then an AI is provided for the nutrient. In addition, most nutrients will have a Tolerable Upper Intake Level (UL). Like the former RDAs and RNIs, each type of DRI refers to the average daily nutrient intake of apparently healthy individuals over time, although the amount may vary substantially from day to day without ill effect in most cases.

In developing recommended intakes, emphasis is placed on the reasons underlying the particular criterion of adequacy used to establish the requirement for each nutrient.

b) Highlight the importance of Individual variability of requirement as a determinant for nutrient requirements.

**Ans:** Today, nutritionists have a wide knowledge of the role of nutrients in health and disease. We know that people need many different nutrients if they are to maintain health and reduce the risk of diet-related diseases. The amount of each nutrient needed is called the nutritional requirement. These are different for each nutrient and also vary between individuals and life stages, e.g. women of childbearing age need more iron than men.

Each nutrient has a particular series of functions in the body and some nutrients are needed in larger quantities than others. For example, protein is needed in gram (g) quantities. Vitamin C is needed in milligram (mg) quantities (1/100 gram) and vitamin B12 is needed in microgram (μg) quantities (1/1000000 gram). Individual requirements of each nutrient are related to a person’s age, gender, level of physical activity and state of health. Also, some people absorb or utilise nutrients less efficiently than others and so will have higher than average nutritional requirements, e.g. among older people, vitamin B12 absorption can be relatively poor.

Factors that affect the nutritional requirements of an individual are the quality and quantity of the food they eat, the efficiency of their digestive system in absorbing and utilizing eaten food and biochemical availability.

The quality of food that we eat can vary depending on the soil and growing conditions of that food. Soil that has been overworked and chemicals added and also drugs and antibiotics that have been given to livestock and crops to aid growth are all factors that affect nutrition in our food and can affect our own body's biochemical and nutritional quality of our food can be affected by the manufacturing process, storage and preparation of our food.

The quality of food that we eat also influences our nutritional status. In developing countries malnutrition is a huge problem but in developed countries under nutrition can occur due to dependence on heavy refined processed foods.

The efficiency of our digestive system affects our nutritional status. Bad condition of our intestines will reduce the absorption of digested foods into our blood stream. Metabolic faults, sensitivity to certain food and the presence of substances like tea and coffee can affect the absorption rate of certain nutrients.

Biochemical availability is the optimum range of intake of a person essential nutritional requirement. This nutritional requirement is influenced by age, growth, sex, pregnancy and breastfeeding, illness, psychological and emotional stress, activity level and other factors like smoking and drinking.

Nutritional requirements change as a person gets older, because the elderly use a lot of medication their absorption, excretion and utilization of nutrients can be affected. Growing children have different nutritional needs to that of adults. For example, a growing infant requires a higher intake of essential fatty acids than that of an adult. In the same way there are different nutrition requirements for young and old there are also very different requirements between the sexes. For example, a woman's nutritional requirements can