04) * Some values are approximations for standard 100g weight people.

Nutritional Component	Boiled Egg (100g)	Boiled Rice and Daal (100g)
• Protein	• ~13g of high quality complete protein, rich in all essential amino acids, especially leucine, lysine and methionine.	• ~ 7g of incomplete protein, together providing more balanced amino acid profile when consumed together. (lentils high in lysine, rice in methionine).
• Amino Acid Profile	• Boiled Egg contains a complete amino acid profile with all essential amino acids present in sufficient amounts for human needs. this includes higher levels of leucine (important for muscle synthesis) and methionine.	• Rice and daal complement each other but are not complete proteins on their own. Together, they balance the lysine deficiency in rice and the methionine deficiency in daal, forming a more complete amino acid profile when combined.
• Cholesterol	• High cholesterol, though recent studies suggest dietary cholesterol may not significantly affect Blood cholesterol in most people.	• No Cholesterol, Boiled rice and daal are naturally cholesterol free, making them suitable for health-conscious diets.
• Vitamins	• Rich in vitamins, especially ~~vitamin~~ vitamin B12, riboflavin (B2), vitamin D, and small amounts of vitamin A and E. These vitamins support energy production & health	• Rice and daal are rich in B-vitamins like folate, thiamine, and niacin, but lack vitamin B12, which is found in Eggs.

05

Ans 5. (1) Common Name : Kokum

- English Name : Garcinia Indica
- Seasonal Use : Typically used in Summer, Known for its cooling properties.
- Nutritional value : Rich in antioxidants, contains hydroxycitric acid (HCA), low in calories, and aids digestion.

(2) Common Name : Gondh (गोंद)

- English Name : Edible Gum
- Seasonal Use : Predominantly used in the winter to make laddus and sweets that provide warmth and energy.
- Nutritional Value : High in fiber, a good source of calcium, and helps in strengthening bones and boosting energy.

(3) Common Name : Jungli Jalebi

- English Name : Manila Tamarind
- Seasonal Use : Available in late winter and spring, used in chutneys and tangy drinks.
- Nutritiond value : High in Vitamin C, fiber, and antioxidants. It is also low in calories.

(4) Common Name : Ramdana / Chaulai

- English Name : Amaranth Seeds
- Seasonal Use : Primarily used during fasting seasons and festivals.
- Nutritional Value : High in protein, calcium, magnesium, and iron. It is gluten-free and helps in boosting immunity.

(5) Common Name : Bhut Jolokia
- English Name : Ghost Pepper
- Seasonal Use : Growth in the summer months, used in spicy pickles and chutneys.
- Nutritional Value : High in capsaicin, which boosts metabolism, and rich in vitamins A and C.

(Q6)

(a) Cooking food in microwave destroys its 'nutritional value'.

Ans(a) → Microwave cooking is actually one of the least forms of cooking to damage nutrients, because of the shorter cooking time. For instance, roasting meat in an oven is more likely to result in nutrient loss compared to cooking it in microwave. Similarly, boiling vegetables can cause more nutrients to escape into the water, whereas microwaving or baking them helps preserve their nutritional content. In this sense, microwave cooking can be not only quicker but also nutritionally beneficial in some cases.

→ water-soluble vitamins like vitamin C and B-vitamins are more likely to be retained in microwaved food since they are less exposed to heat an water, where nutrients can leach out.

→ The quick cooking process minimizes nutrient loss, making it a nutritionally advantageous method.

(b) Refrigerating food destroys its 'nutritional value'.

Ans (b) → Refrigerating food doesnot destroy its nutritional value; instead, it helps to preserve nutrients by slowing down the spoilage process and bacterial growth. While there may be minimal nutrient loss over time, particularly with water-soluble vitamins like vitamin C, the overall nutritional content remains largely intact.

→ Refrigeration is essential for maintaining the freshness and quality of perishable foods, preventing rapid nutrient degradation that occurs at room temperature. Thus, refrigeration preserves, rather than destroys, nutritional value.

(c) Genetic modifications in plants or animals are 'bad'.

Ans (c) → The claim that genetic modifications in plants or animals are inherently "bad" lacks a solid scientific basis. Genetic modification (GM) is a tool that can offer both benefits and potential risks, depending on how it's used. Scientifically, GM technology has been employed to enhance crop yields, improve resistance to pests and diseases, and even increase the nutritional content of foods (e.g, golden rice rich in vitamin A). However, concerns exist about unintended environmental impacts, such as the potential for cross breeding between GM plants and wild species or the development of pesticide-resistant pests. Additionally, some worry about long-term health effects, though current research doesnot provide conclusive evidence that GM foods are harmful to humans.

→ Therefore, GMs themselves are neither inherently "good" or "bad".

(07)

Ans 7. 1. Bomb Calorimetry : This technique is used to measure the energy content of food by calculating the heat released during combustion.

2. Sample Placement : A carefully weighed food sample is placed in a strong, sealed container called a "bomb".

3. Oxygen Environment : The bomb is filled with pure oxygen, allowing complete combustion of food sample.

4. Water Bath Setup : The bomb is submerged in a known quantity of water within a calorimeter, which measures heat changes.

5. Combustion Process : The food sample is ignited electrically, causing it to burn completely in oxygen rich environment.

6. Heat Transfer : The heat from combustion is transferred to surrounding water, raising its temperature.

7. Temperature Measurement : The increase in water temperature is recorded, which corresponds to the energy released by the food.

8. Caloric Calculation : the amount of heat absorbed by the water is used to calculate the total energy content of the food in calories or Kilocalories (Kcal).

(08)

Ans (8) (1) Flavor Profile Prediction Software : Advanced Algorithms that analyze ingredients combinations to predict the flavor profile of new recipes, helping chefs create novel dishes with desired taste profiles.

(2) Automated Recipe Optimization Tools : AI-driven platforms that optimize recipes for specific dietary needs (e.g., low sodium, high protein) by adjusting ingredient quantities and cooking methods while maintaining taste and texture.

(3) Ingredient Substitution AI : Machine learning systems that suggest suitable ingredient substitutions based on flavor compatibility, nutritional content, and availability, allowing for flexible and adaptable cooking.

(4) Nutritional Analysis Apps : Apps that provide real time nutritional breakdowns of recipes by scanning ingredient lists and calculating macro and micronutrient content using computational models.

(5) Virtual Culinary Assistants : AI-powered virtual assistants that guide user through cooking processes with step-by-step instructions and real-time adjustments based on user feedback and ingredient performance.

(6) Flavor Compound Mapping Tools : Software that maps and visualizes the molecular compounds responsible for flavor in different foods, aiding in the creation of new flavor combinations

(7) Automated Food Pairing Machines : Devices that uses computational Gastronomy to automatically combine ingredients based on their chemical and sensory properties, creating unique and balanced flavor profiles.

(8) Personalized Recipe Generators : AI systems that create custom recipes tailored to individual taste preferences, dietary restrictions, and nutritional goals by analyzing user data and ingredient interactions.