BIOLOGY UNIT
KELANTAN MATRICULATION COLLEGE

BIOLOGY ASSIGNMENT SB015

SEMESTER I SESSION 2026/2027

TASK	ESSAY WRITING & NUTRIDECODE MINI PROJECT
	INDIVIDUAL
TOTAL MARKS	15 %
CHAPTER	1.0: MOLECULES OF LIFE 2.0: CELL STRUCTURES AND FUNCTIONS
OBJECTIVES	1. Students are able to relate the properties of water and its importance 2. Students are able to compare the structures and functions of polysaccharides 3. Students are able to explain the formation and breakdown of triglycerides 4. Students are able to explain the formation and breakdown of dipeptide and polypeptide 5. Students are able to explain the structure of DNA and RNA 6. Students are able to explain the structure of prokaryotic and eukaryotic cells 7. Students are able to explain the structure of the plasma membrane and the functions of its components 8. Students are able to explain the animal cells and tissues
INSTRUCTIONS	1. **Essay** must be the **ORIGINAL WORK** of the student and **handwritten** using foolscap paper. Any plagiarized work will be penalized. 2. **NutriDecode Mini Project** must be the **ORIGINAL WORK** of the student**.** Any plagiarized work will be penalized. 3. Details which include **NAME, MATRIC NO., CLASS AND LECTURER'S NAME** must be stated on the front cover given. 4. Marks will be given based on the accuracy of information. 5. Minimum of **2** references (e.g.: book, journal, etc) are required. 6. The dateline is **6/08/2026 (Thursday)** on **2.00 pm.**

Instruction:
Choose and answer ONE (1) question only from Part A and complete ALL task for Part B.

PART A: ESSAY WRITING

1. (a) On average, seawater in the world's ocean has a salinity of about 3.5%. It means that every kilogram of seawater has approximately 35 grams of dissolved salts.
Explain property of water related to the situation above. Using table salt as an example, **describe** how table salt can dissolve in water.

[10 marks]

(b) Brucellosis is a type of zoonotic disease that can caused abortion during pregnancy, infertility and swollen joints in camel (*Camelus dromedarius*). These symptoms are caused by a type of bacteria *Brucella melitensis*.
Name the type of cells in *Brucella melitensis* and camel. **Differentiate** both types of cells in term of their genetic materials.

[5 marks]

2. (a) In the human body, glycogen is stored mainly in the liver and the skeletal muscle that supplies glucose to the blood stream during fasting periods and to the muscle cells during muscle contraction.

State the molecule that acts as energy storage in plants and c**ompare** this molecule with cellulose in terms of their structure.

[5 marks]

(b)The plasma membrane is a biological membrane that serves as the boundary between the outer and inner cellular environment. This membrane also permits the cell itself to connect with its environment in a regulated manner.
Describe the structure of the plasma membrane based on the Fluid Mosaic Model.

[10 marks]

3. (a) Ovalbumin constitutes about 54% of the total egg albumen present in egg white. The amino acid composition analysis of egg albumen revealed that 50% of the total amino acids are hydrophobic while 30% are charged amino acids.
Based on composition analysis above, **identify** groups of amino acid make up the egg albumen? Using your prior knowledge, **explain** briefly the breakdown and formation of peptide bond in egg albumen.

[10 marks]

(b) The Human body contains more than 600 muscles that make up about 40% of overall body weight.
Compare the structure of **smooth** muscle and **skeletal** muscle.

[5 marks]

4. (a) In 1985, Alec Jeffreys helped provide scientific evidence for an immigration dispute by matching a boy to his biological parents through DNA profiling to allow his British citizenship. This case proves that DNA is an important genetic material. **Compare** the structure of DNA and other types of nucleic acids.

[5 marks]

(b) Physical activity stimulates bone formation and strengthens the skeletal system. A lack of regular weight-bearing exercises such as walking results in weaker bones. **Explain** the structure and function of compact bone in a healthy person.

[10 marks]

PART B: NUTRIDECODE MINI PROJECT

Conduct a mini project on **TWO (2)** samples of packed food and **ONE (1)** sample of drink to complete the following tasks:

1. **Evaluate** the nutritional information of the packed food and drink containing **at least THREE (3)** important nutrients.
2. **Tabulate** the data of total carbohydrates, total fat, and total protein per 100gm / 100ml of your packed food and drink samples.
3. **Convert** the data of total carbohydrates, total fat, and total protein in gram unit into calorie unit. **Show** your calculation.
4. **Answer** these questions:
   a) According to your data, **which** sample has highest total of fat?
   b) **What** is the correlation between the total energy of fat with the total energy of the food or drink?
   c) **Why** does fat release more energy than carbohydrates based on their structures?

Design a digital poster to present your findings. **Include** the plastic wrapper of the packed food and drink samples in the poster for reference.

SCORING CRITERIA:

RUBRIC FOR PART A: NUTRIDECODE MINI PROJECT	TOTAL MARKS
Poster neatness and creativity	3
Content and data presentation:	
▪ Table of nutritional information ▪ Title for table of nutritional information ▪ Include packed food and drink samples in poster for references	2 1 2
▪ Calculation of calorie value	3
▪ Questions	1
Digital technology	3
TOTAL	15

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ASSIGNMENT:

ESSAY WRITING & NUTRIDECODE MINI PROJECT
CHAPTER 1: MOLECULES OF LIFE
CHAPTER 2: CELL STRUCTURES & FUNCTIONS
PART A
PART B: QUESTION 1 / 2 / 3 / 4 (circle only one)

NAME : _____
MATRIC NUMBER : _____
CLASS : _____
LECTURER'S NAME : _____

For Examiner Use Only		
	Marks	
	Examiner	HM / M
Part A		/15
Part B		
References (APA Format)		
Originality		
Consultation		
Dateline (6th August 2026)		
TOTAL MARKS	/35	/15