



FACULTY OF EDUCATION AND ARTS

School of Service Professional Development

FINAL EXAMINATION

Student ID (in Figures) :

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Student ID (in Words) : _____

Course Code & Name : **MPU3232 Academic Writing Skills**
 Trimester & Year : January – April 2023
 Lecturer/Examiner : Nur Harizah Mohd Faiz
 Duration : 2 hours

INSTRUCTIONS TO CANDIDATES

1. **This question paper consists of 2 parts:**
 - PART A : READING COMPREHENSION & SUMMARY**
 (55 marks) There are **TWO (2)** sections in this part. Answer both questions in the space provided.
 - PART B : ESSAY WRITING**
 (45 marks) There is only **ONE (1)** section in this part. Answer the question in the space provided.
2. **Candidates are not allowed to bring any unauthorized materials except writing equipment into the Examination Hall. Electronic dictionaries are strictly prohibited.**
3. **This question paper must be submitted along with all used and/or unused rough papers and/or graph paper (if any). Candidates are NOT allowed to take any examination materials out of the examination hall.**
4. **Only ballpoint pens are allowed to be used in answering the questions, with the exception of multiple choice questions, where 2B pencils are to be used.**

WARNING: The University Examination Board (UEB) of BERJAYA University College regards cheating as a most serious offence and will not hesitate to mete out the appropriate punitive actions according to the severity of the offence committed, and in accordance with the clauses stipulated in the Students’ Handbook, up to and including expulsion from BERJAYA University College.

Total Number of pages = 8 (Including the cover page)

PART A : READING COMPREHENSION & SUMMARY (55 MARKS)

INSTRUCTION(S) : There are **TWO (2)** sections in this part. Answer both questions in the space provided.

Genetically Modified Organisms: Public Concerns in Crops for Human Consumption

Adapted from: Raman, R & Warwick KW 2020, 'Genetically Modified Organisms: Public Concerns in Crops for Human Consumption'. *Journal of Food Science and Technology*, 50(6), pp.1035-1046.

GMO crops are incredibly common in the United States, and are subject to a lot of controversy. With at least 90% of soy, cotton, and corn being grown through genetic techniques, it is estimated that up to 80% of foods in supermarkets contain ingredients that come from genetically modified crops.

GMOs, short for genetically modified organisms, refers to any organism whose DNA has been modified using genetic engineering technology. In the food industry, GMO crops have had genes added to them for various reasons, such as improving their growth, nutritional content, sustainability, pest resistance, and ease of farming. According to the U.S. Department of Agriculture (USDA), GMO seeds are used to plant over 90% of all maize (corn), cotton, and soy grown in the United States, which means that many of the foods eaten by Americans are likely to contain GMOs. Although some claim they may harm human health and the environment, most notable organisations and research findings insist that GMO foods offer several advantages.

Many GMO crops have been genetically modified to produce a gene that protects them against pests and insects. For example, the *Bt* gene from a naturally occurring bacterium known as *Bacillus thuringiensis* is commonly genetically engineered into crops like corn, cotton, and soybeans. This gene produces a protein that is toxic to several pests and insects, which gives the GMO plants a natural resistance. As a result, the GMO crops don't need to be exposed to harmful pesticides as often. In fact, an analysis of 147 studies from 2014 found that GMO technology has reduced chemical pesticide use by 37% and increased crop yields by 22%. Other GMO crops have been modified with genes that help them survive stressful conditions, such as droughts, and resist diseases like blights, resulting in a higher yield for farmers. Hence, these factors also help lower the costs for the farmers and consumers because it allows a greater crop yield and growth through harsher conditions.

Herbicide-tolerant (*Ht*) GMO soy crops have reduced the need to till the soil to remove weeds. Tilling is a process that involves breaking up the soil, which brings carbon to the surface. When that carbon mixes with oxygen in the atmosphere, it becomes carbon dioxide and contributes to global warming. Reduced tilling preserves topsoil, reduces soil erosion and water runoff (keeping fertilisers out of the water supply), and lowers carbon emissions. The decreased use of fuel and tilling as a result of growing genetically modified crops can lower greenhouse gas emissions as much as removing 12 million cars from the roads each year.

Additionally, genetic modification can increase the nutritional value of foods. For example, rice high in beta carotene, also called golden rice, was developed to help prevent blindness in regions where

local diets are chronically deficient in vitamin A. Moreover, genetic modification may be used simply to enhance the flavour and appearance of foods, such as the non-browning apple.

Despite GMO crops making farming much easier, there are concerns around potential effects to their safety for human consumption, specifically surrounding illnesses and allergies. Some people have raised fears that eating GMO food could lead to genetic changes in humans. In 2009, food scientists noted that food DNA can survive as far as the human stomach, and there have been concerns that this could affect the immune system. Similarly, there's a common concern that GMO foods may aid the progression of cancers. This worry stems partly from an early mice study, which linked GMO intake to a higher risk of tumours and early death. Because cancers are caused by DNA mutations, the fear of eating foods with added genes affecting human DNA is intensified.

The process of GMO foods mean they contain foreign genes, so some people worry that they harbour genes from foods that may prompt an allergic reaction. A study from the mid-1990s found that adding a protein from Brazil nuts to GMO soybeans could trigger an allergic reaction in people sensitive to Brazil nuts. Due to these concerns, some farmers and food producers are opting for conventional plant breeding methods as opposed to genetic modification. Genetic improvement has been a central pillar of improved agricultural productivity for thousands of years and selective breeding is a safer method of delivering genetic crop improvement.

However, while it's possible to naturally give foods desirable traits through selective breeding, this process takes many generations. Also, breeders may struggle to determine which genetic change has led to a new trait. Genetic modification significantly accelerates this process by using scientific techniques that give the plant the specific desired trait.

It is important to note that all food from plants or animals contains genes. In cooked or processed foods, most of the DNA has been destroyed or degraded and the genes are fragmented. Whether fresh or cooked, when food is eaten, it is digested into its constituent parts from which the human body makes its genes and proteins. Therefore, most of the DNA in food, whether GMO or not, is either destroyed by cooking or breaks down before it reaches the large intestine. Although small fragments of DNA from food can and do enter the bloodstream and body organs, there is no evidence that they have any impact on genetic makeup or human health.

Research in GMO crops are done so that no changes are made in ways that would increase the health risk for the humans or animals that eat them. An analysis of data by the National Academies of Sciences, Engineering, and Medicine found that patterns of change in cancer rates in the United States are similar to Europe and the United Kingdom, where people eat less GMO foods. Therefore, cancer rates are not connected with eating GMOs. The way GMOs are created also allows scientists to know precisely which new proteins are produced in a plant. Scientists perform tests to make sure these proteins are not allergens. This type of testing, called allergenicity testing, is always part of the process for developing GMOs. This practice, coupled with stringent FDA regulations, ensures that foods derived from GMOs are as safe as the non-GMOs variants.

d) **FOUR (4)** reasons to support the opposing claim

(8 marks)

e) **FOUR (4)** refutations of the reasons in support of the opposing claim

(8 marks)
