Teknik Menjawab Soalan - Describe Eutrophication Process (UPDATED FOR SPM 2017).

**This post was originally posted back in 2013. I realized one of the trial question 2017 asked about eutrophication. So, I'm digging old treasures just for you SPM 2017 sitters.*

1. Eutrophication is one of the **most famous question for Biology SPM**.

(b) A group of farmer plan to develop an agriculture nearby the lake. Besides to obtain a high agriculture yield, they suggest that the area to be made into an ecotourism area. The following are details of their planning.

Sekumpulan peladang merancang untuk menjalankan aktiviti pertanian berhampiran sebuah tasik. Selain menguruskan ladang pertanian , mereka bercadang untuk membangunkan satu kawasan eko-pelancongan. Berikut adalah perincian tentang rancangan tersebut:

TRIAL SPM 2017 (Pahang)

Types of plants *Jenis tanaman*	: Strawberry and Orchid plants *: strawberi dan bunga orkid*
Location *Lokasi*	: nearby a natural lake *: Berhampiran tasik semulajadi*
Types of fertilisers used	: compost, lead nitrate salt, magnesium nitrate, Phosphate
Jenis baja yang digunakan	*: baja kompos, garam plumbum nitrat, magnesium nitrat dan fosfat*

Based on the statement given, explain the effect to the lake if their management is not properly carried out.

Berdasarkan pernyataan yang diberi, terangkan kesan ke atas tasik ini sekiranya pengurusan tidak dilaksana dengan sempurna.

[10 marks]

To answer the question above, I give you technique to answer it by using **FADDDDD** (1 F & 5 'D's).

2. The FADDDDD outline:

Fertilizers - phosphates & nitrates (P&N)

Enter rivers --> algal bloom

Alga blocks sunlight --> submerged plants die

Submerged plants die --> aquatic life dies

P&N level drops --> alga die

many DIE DIE DIE --> increase bacterias --> decomposition

less oxygen --> high BOD --> dead zone

example - Gulf of Mexico Dead Zones

PROCESS

CLICK TO ENLARGE

3. The specific question for this FADDDDD would be about the **process & consequence of eutrophication.** Let's discuss what are the initials in the FADDDDD:

F - Fertilizers
A - Algal bloom
D - Die (submerged plants)
D - Die (aquatic life aka fishes)
D - Die (alga itself!)
D - Decomposition
D - Dead zone

4. The FADDDDD is favorable as it **covers all important points needed for full marks** (terms, explanations/processes, & examples - remember **PEE system** in my previous posts).

Q: Discuss the eutrophication process which leads to a high BOD in an ecosystem.

Answer Outline:

The **fertilizers** contain many chemicals such as **phosphates & nitrates.**

When fertilizers are used in an agricultural activity, it will seep into the nearby water source such as **river or lakes.**

This will cause the river/lakes to have **alga bloom.**

Much alga will cover the surface of the lake.

As a result, sunlight cannot penetrate the lake, causing the submerged plants to receive less sunlight.

It can lead to their **death** if the plants cannot conduct photosynthesis.

As a result, oxygen will be less, leading to **death** of other aquatic organisms such as **fishes.**

Also, the fertilizer chemicals will be used up, leading to the **death** of the alga itself.

Much dead substance will lead to high amount of bacteria.

They will conduct **decomposition** on the dead substances.

Much bacteria will cause less oxygen, leading to higher BOD level of water.

Eventually, this will cause **dead zone**, as no life can survive in water due to low oxygen level.

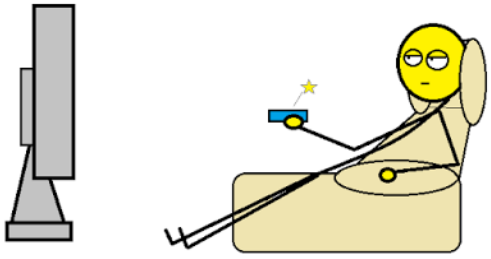
The example of eutrophication process occurs in the **Gulf of Mexico Dead Zones**

The answer is given *full marks (nearly 100%)* because it contains **these important points:**

1. Can you see the **red bold words**? Those are the important terms (*istilah*) enlisted as FADDDDD.
2. Can you see the **blue bold words**? Those are the right examples.
3. Can you see the red-underlined sentences? Those are the correct explanations.

SPM 2017 TRIAL QUESTION ANALYSIS - Role of Exercise to Lymphatic System

1. Let's observe the pic below:



2. A typical couch potato. This prolonged state could be detrimental to his lymphatic system.

3. This is because the **lymph cannot be pumped properly by the skeletal muscle contraction.** We can say this since the person is not physically active**.** So, this person needs a regular exercise.

4. We can use this info to answer a short trial question in Paper 2:

(d)

Situation:
An old man has been sick for six months and he was bed ridden. His muscles became weak and he could not move his limbs due to excess of interstitial fluid in the lower parts of his body.
His doctor suggested him to undergo physiotherapy immediately.

Situasi:
Seorang lelaki tua telah jatuh sakit dan terlantar selama enam bulan. Otot beliau menjadi lemah dan tidak dapat menggerakkan kakinya disebabkan pengumpulan bendalir interstis di bahagian anggota bawah badan.
Doktor mencadangkan beliau menjalani fisioterapi dengan segera.

Based on the situation above, explain how the skeletal muscles and the structure of lymphatic vessel can prevent the condition from happening.

Berdasarkan situasi di atas, terangkan bagaimana otot rangka dan struktur salur limfa boleh mengelakkan keadaan tersebut daripada berlaku.

- Skeletal muscle is needed to pump the lymph fluid. — role of skeletc muscle?
- This is because lymphatic vessel is not connected to heart. — connection w lymphatic ve
- So, physiotherapy exercise like slow walk or swimming is required. — how to preve condition?
- As a result, lymph fluid runs and insterstitial fluid can be returned into bloodstream. — end result?

[4 marks]

Read/Download the rest of questions here.

5. **HINT:** Read the questions carefully and find the key points (*circled ones*). Write down your answer in short, concise sentence. Don't forget the conjunctions! (*so, as a result*).

SPM 2017 TRIAL QUESTION ANALYSIS - GMO Food

1. GMO food, they are everywhere! Just look at the big fat KFC drumsticks...

2. We all know the importance of trial questions since the real SPM questions would be based on them. Let's discuss one question from a trial paper for MRSM:

(c) The following statement is given by a biotechnologist :
Berikut adalah pernyataan dari seorang ahli bioteknologi :

> Genetic engineering is the scientific practice of manipulating the genes of a living organism. It is most commonly used in crops by altering the structure of DNA using molecular cloning and other methods. The result of genetically modifying organisms (GMO) is genetically modified food.
> *Kejuruteraan genetik adalah amalan saintifik untuk mengubahsuai gen organisma hidup. Ianya biasa digunakan dalam pertanian dengan mengubahsuai struktur DNA secara pengklonan molekul dan kaedah-kaedah lain. Hasil dari organisma terubahsuai secara genetik (GMO) adalah makanan terubahsuai genetik.*

Based on the above statement, discuss the benefits and the risks of using the genetically modified organisms (GMO) in agriculture to improve the food production.

Berdasarkan pernyataan tersebut, bincangkan kebaikan-kebaikan dan risiko-risiko menggunakan organisma terubahsuai secara genetik dalam pertanian untuk meningkatkan penghasilan makanan.

[10 marks]
[10 *markah*]

3. The question is quite straightforward, which we need to **elaborate the benefits and risks of GMO food**.

4. Remember, this is a discussion-type question which asks about some biotech application (in this case, genetics applied in GMO production).

5. Critical: So, you need to put intro, conclusion, **PEE schema** (Point-Explain-Example), and lots of conjunctions (*firstly, secondly, besides, also, as a result, etc...*).

6. So, here are my proposed answer outline which will guarantee you a perfect 10-mark score:

Hint	*Answer Outline*	*Point*
Intro	GMO Food – food comes from organisms being genetically engineered. *Add the sentence below for extra *umpph:* *Here, I would like to discuss 2 benefits and 1 risk of GMO food.*	1
Benefit 1 + Explain + Example	-Improve nutrient content and volume, size. -Food is healthier, more nutrient content. -Transgenic cow provides richer and more milk.	3
Benefit 2 + Explain + Example	-Increase lifespan. -Plant provide more food in longer time. -Transgenic maize provides more maize per shelf life.	3
Risk 1 + Explain + Example	-Unknown long-term effect. -GMO plant/animals are genetically different than normal ones. -Can cause allergy or cancer.	3
Conclusion	GMO has both positive and negative effect which geneticists need to pay attention.	1
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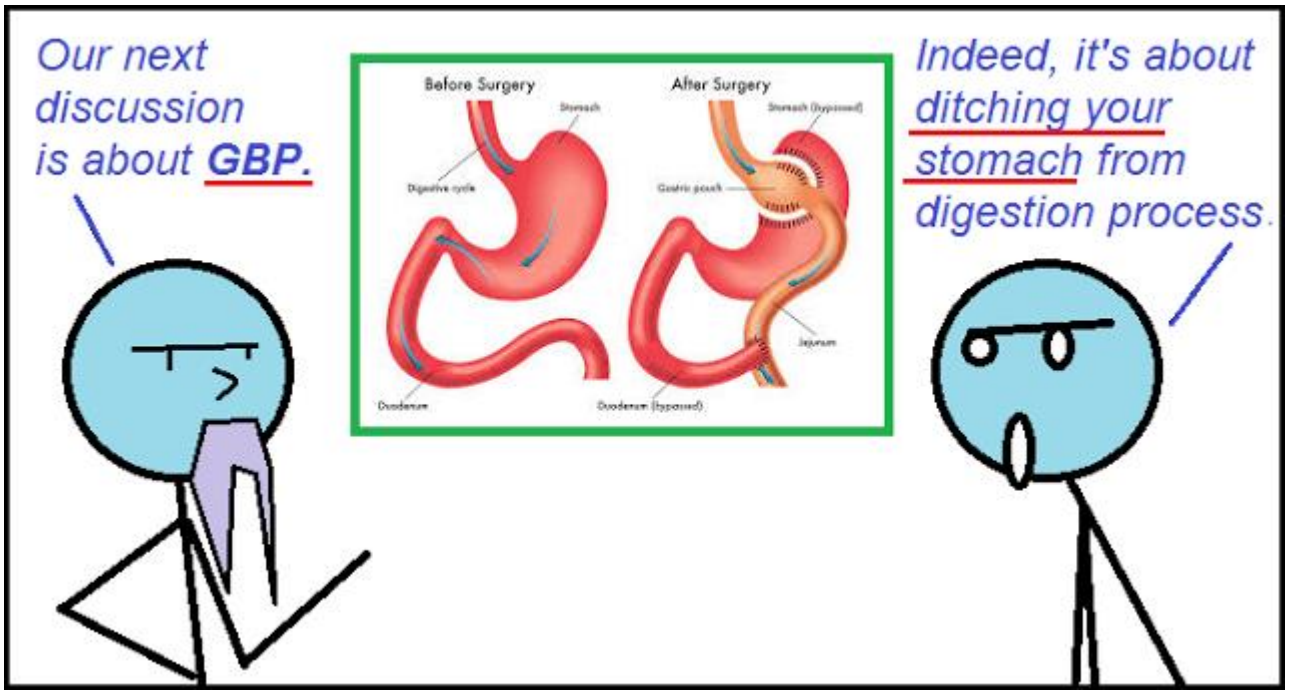
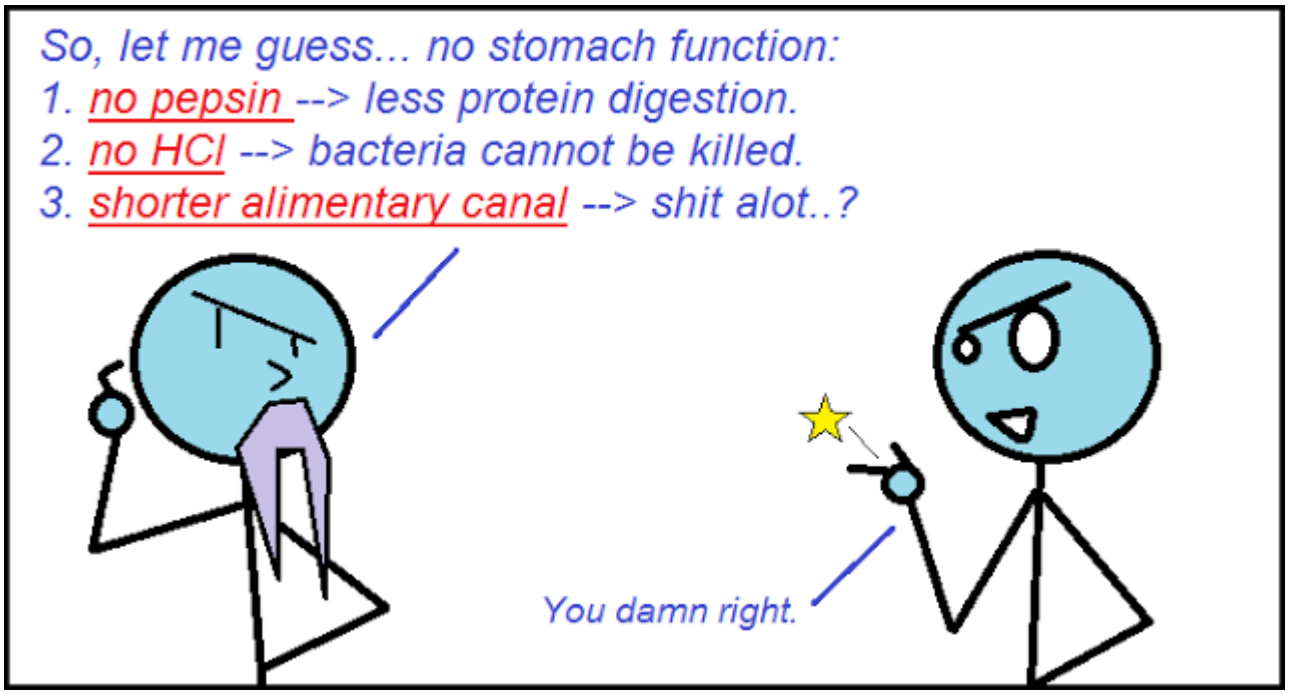
TEKNIK MENJAWAB : Gastric Bypass Procedure (UPDATED FOR SPM 2017)

KBAT question is not about new, hard, difficult, or unusual topics. It's about **text-book topics being asked in different perspectives**. Here, we shall discuss the GBP, which the basic features we already learnt in F4 in Nutrition chapter:

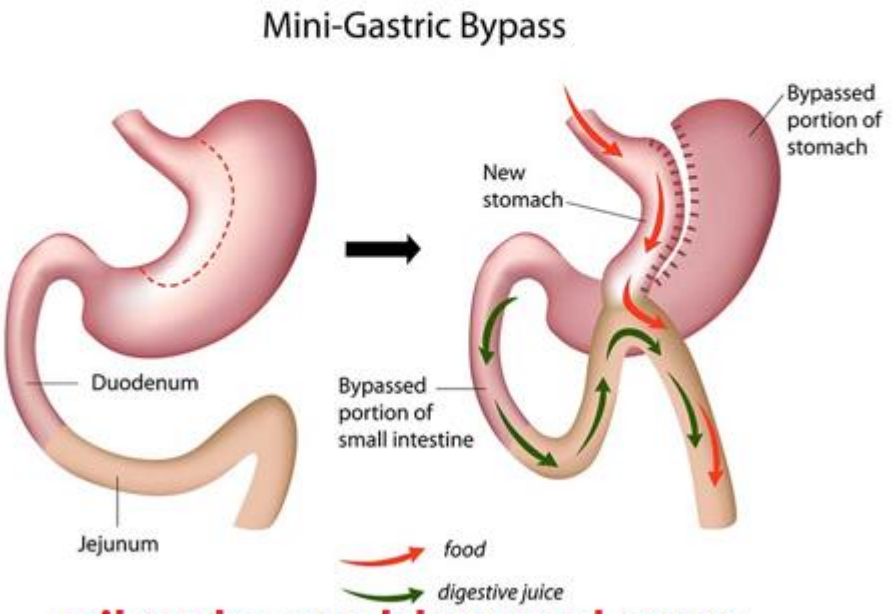
Let's revise the concept from Nick and Singer below...





Easy enough. Now we can go straight to the KBAT question examples:

Gastric bypass surgery refers to a surgical procedure in which the stomach is divided into a small upper pouch and a much larger lower "remnant" pouch and then the small intestine is rearranged to connect to both. Surgeons have developed several different ways to reconnect the intestine, thus leading to several different gastric bypass (GBP) procedures. Any GBP leads to a marked reduction in the functional volume of the stomach, accompanied by an altered physiological and physical response to food. (credit Wikipedia.)



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KBAT Question	Answers
1. What do you think the altered physiological and physical response to the food would be? (2m).	**Physiological** – The person would easily feel satiated. **Physical** – The person would ingest less amount of food or having longer time interval between meals.
2. State 4 reasons for GBP to be conducted. (4m). cikguheery.blogspot.com	- To lose weight from highly obese people. - Due to chronic stomach diseases such as cancer or gastritis. - To curb the extreme desire of overeating. - To reduce the cost in food consumption. - To reduce the risk of obesity-associated disease such as heart attack, high blood pressure, or stroke.
3. State 2 implications to the digestive system after GBP. (2m)	- Reduced protein digestion rate. - Increased frequency for defecation. - Pathogens still survive in the food due to low amount of HCl.
4. Do you agree to undergo GBP procedure? Explain your reason. (4m) cikguheery.blogspot.com	**AGREE:** - If I suffer from advanced stage of stomach cancer. This could jeopardize my life. 2 - If I have high chronic eating disorder. I need to control my eating or I will suffer from obesity-related disease. 2 **DISAGREE:** - I can lose weight via exercise and strict diet. All I need is strong will and discipline. 2 - I can treat my stomach cancer via other non-invasive treatment. For example, radiotherapy & chemotherapy. 2

Let's analyse the answers:

Question 1: Full marks are given because the student has **given the answer according to the question** (physiological and physical). (That's why you need to read the question carefully!).

Question 2: Full marks are given due to **relevant (logical) answers.**

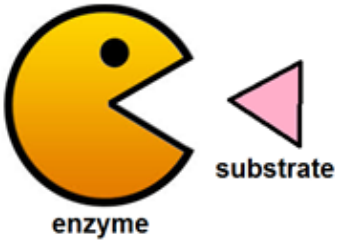
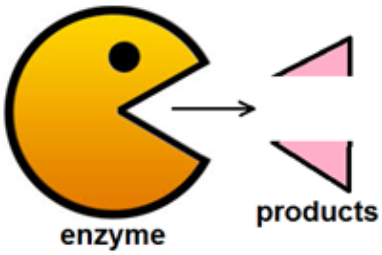
Question 3: Again, full marks are given because the student has **given the answer according to the question** (regarding the digestion system).

Question 4: Again, full marks are given due to **relevant (logical) answers + relevant reason.**

REMINDER:

If you see my answers, they are rather short and concise. Yup, that's the gist of SPM essay writing. So, keep your answer short and simple. Just remember this : One sentence = one relevant point = one full mark.

QUESTION: Explain the Lock and Key Hypothesis of enzyme action (6 marks).

Diagram	Points
	1. First, the substrate would be attracted to the active site of enzyme.
	2. This is because the active site of enzyme is highly specific to the substrate.
	3. The enzyme and substrate would combine and form enzyme-substrate complex.
	4. This combination is highly unstable.
	5. As a result, substrate would leave the active site as products.
	6. In the end, enzyme does not change and ready to receive another substrate.

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