

## Essay {Paper02}

## [SPM11-08b]

A	B
The grease stains is removed	Some grease stain still remain
More effective	Less effective

Reason

1. Hard water contains  $Mg^{2+}$  and  $Ca^{2+}$  ions
2. Cleaning agent B react with  $Mg^{2+}$  /  $Ca^{2+}$  / hard water to form scum// Cleaning agent A react with  $Ca^{2+}$  /  $Mg^{2+}$  / hard water to form soluble salt/ no scum.

Type of A : detergent and Type of B : Soap

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## [MRSM11-08c] [My Own Schema]

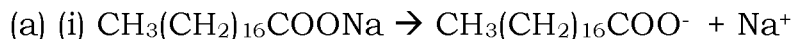
- (c) (i)
1. Hard water is water that contains  $Mg^{2+}$  or  $Ca^{2+}$  ion
  2. Soap produce scum/insoluble salt when react with hard water
  3. Detergent produce soluble salt/ no scum when react with hard water
  4. Detergent is better cleaning agent than soap

- (ii)
1. The cloth are dipped in a detergent solution
  2. Detergent **reduces the surface tension of water** and increases the wetting ability of water on the surface of the cloth
  3. The **hydrophobic** part of the detergent **dissolves in the oily stains** and the **hydrophilic** part is **attracted to the water molecules**
  4. Mechanical agitation during scrubbing helps pull the oily stains free and break the oily stains into small droplets
  5. The droplets do not coagulate and redeposit on the surface of the socks due to the repulsion between the negative charges on the surface
  6. The droplets are suspended in water forming an emulsion and a Rinsing washes away these droplets and leaves the surface clean

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## [SBPtrial08-07c]

- (c)(i)
- |                                     |   |
|-------------------------------------|---|
| A: Hydrophobic part                 | 1 |
| B: Hydrophilic part                 | 1 |
| Part A is dissolved in oil / grease | 1 |
| Part B is dissolved in water        | 1 |
- (ii)
- Anions of detergent are more effective than anions of soap in hard water. 1
  - Anions of soap react with **calcium ions/magnesium ions** to form **scum** / insoluble **precipitate**. 1
  - Amount of anions of soap is reduced /decreased. 1
  - Anions of detergent do not form scum/precipitate /the salts formed are solubled 1
  - $2 CH_3(CH_2)_{14}COO^- + Ca^{2+} \rightarrow [CH_3(CH_2)_{14}COO]_2Ca$  1
  - Or  $2 CH_3(CH_2)_{14}COO^- + Mg^{2+} \rightarrow [CH_3(CH_2)_{14}COO]_2Mg$  1

**[MRS07-10a]**

- (ii) 1. Sodium dodecyl sulphate more effective cleansing agent  
 2. Hard water contain magnesium ions and calcium ions  
 3. Sodium stearate produce scum, insoluble when ionize in hard water  
 4. Sodium dodecyl sulphate ionize in water and combine with calcium ion or magnesium ions produce soluble salts, that can clean in hard water.

(iii) Chemicals used : palm oil , concentrated sodium hydroxide solution, sodium chloride

1. 5 cm<sup>3</sup> of palm oil is poured into a beaker
2. 25 cm<sup>3</sup> of concentrated sodium hydroxide solution is added in the same beaker
3. The mixture is boiled and stirred for a few minutes
4. 50 cm<sup>3</sup> of distilled water and two spatulas of table salts (sodium chloride) are added.
5. The mixture is boiled slowly while being stirred with a glass rod for 15 minutes
6. The mixture in the beaker is left to cool down and the resulting white solid is filtered
7. The white solid that is produced is washed with a little water and dried with the filter paper
8. The following tests are carried out on the white solid:
  - a) Touched using a finger
  - b) Some of the white solid is shaken together with water in a test tube.
  - c) Tested with a red litmus paper.
9. The observations are recorded in the table provided

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**[MRS08-08d,e]**

- (d) 1. in acidic water contain H<sup>+</sup> ion that free to move  
 2. and combine with soap negative ion to formed back **into a carboxylic acid.**

- (e) 1. to ensure all bacteria was killed completely  
 2. and to prevent bacteria to immune with the medicine  
 3. if the same sickness attacks again, more dose of medicine is required

- (f) 1. Aspirin contains anti-inflammatory and anti-coagulant  
 Can cause more injured to stomach

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**[MRS11-08b] [My Own Schema]**

Medicine	Type	Function
A	Analgesic	relieve pain
B	Antibiotics	Kill or inhibit growth of infectious bacteria
C	Psychotherapeutic	Control symptoms of mental illness

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**[SPM11-08a]**

(a)(i)

Type of additives	Example
Dye	Add / restore the colour
Flavouring agent	To improve the taste of food/ enhance/ sweeten the food
anti-oxidation	Prevent oxidation of food/ reduce oxidation

(ii) ingredient  
Sugar

Food additive  
Aspartame

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**[SPM08-07]**

- a) 1. Ethyl butanoate is used as a flavouring agent  
2. Sucrose is used as a flavouring agent  
3. Citric acid is used as an antioxidant  
4. Gelatin is used to thicken food  
5. Sodium benzoate is used to slow down or prevent the growth of microorganism
- b) The medicine prescribed to Aida is an **analgesic**. An analgesic is a medicine used to relieve pain. Some of the common examples are **aspirin, paracetamol and codeine**. Paracetamol is prescribed to Aida. It must be taken at the **recommended dose**.

The medicine prescribe to May Ling is **antibiotic**. Antibiotics are used to kill or slow down the growth of bacteria. Some of the common examples of antibiotics are **penicillin and streptomycin**. May Ling must take the **full course** of the antibiotic prescribed.

- c) i) Experiment I and III
- Both the **cleaning agents A and B are effective in soft water**. Soft water **does not contains calcium and magnesium ions**.
  - Both are **dissolves** in soft water.
  - They are able to lower the surface tension of water. The water wets the surface of the cloth thoroughly.

ii) Experiment II and IV

- Cleaning agent A is not effective in hard water.** Hard water **contains calcium and magnesium ions.**
- These ions react with the cleaning agent A to form an insoluble precipitate (scum).** Formation of scum greatly reduces the number of cleaning agent A molecules available for cleaning.
- Cleaning agent B is effective both in soft water and hard water.** It can perform its cleaning action in hard water.
- Cleaning agent B does not form precipitate (scum)** in hard water. Its more effective in cleaning action than cleaning agent A.

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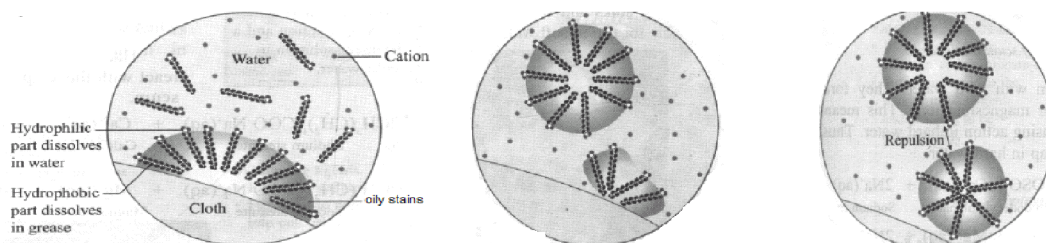
[SPM03-08]

a)

Methods of food preservation	How the methods work
Adding salt or sugar	Draws the water out of the cells of microorganisms Retards the growth of microorganisms
Adding vinegar or spices	Provides an acidic condition that inhibits the growth of microorganisms
Adding sodium nitrite or sodium nitrate, benzoic acid or sodium benzoate, and sulphur dioxide	Slow down the growth of microorganisms
Freezing or deep freezing	Low temperature slows down the growth of bacteria or microorganisms
Drying or drain out water from food	Microorganisms cannot live without water
Canned or sterilization or pasteurisation or heating or vacuum	Inhibit the growth of microorganisms

b) The cleansing action of soap:-

- The socks are dipped in a soap solution
- Soap **reduces the surface tension of water**
- Soap increases the wetting ability of water on the surface of the socks
- The **hydrophobic** part of the soap **dissolves in the oily stains**
- The **hydrophilic** part is **attracted to the water molecules**



- Mechanical agitation during scrubbing helps pull the oily stains free and break the oily stains into small droplets
- The droplets do not coagulate and redeposit on the surface of the socks due to the repulsion between the negative charges on the surface
- The droplets are suspended in water forming an emulsion
- Rinsing washes away these droplets and leaves the surface clean

**[MRSM06-08a]**

(a) Fungsi

Membina/menguatkan tisu otot// mempercepatkan pemulihan otot yang tercedera.

kesan

1. Kerosakan hati
2. risiko penyakit kardiovaskular/ lemah jantung
3. tekanan darah tinggi
4. berat badan bertambah
5. kekejangan otot
6. sakit sendi
7. mata menjadi buta/rabun

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**[SPM2010-07b]**

(b)(i)

	Nama	Types	Functions
P	Sugar	Preservative// flavouring	Prevent growth of microorganism To improve the taste
Q	Benzoic acid // sodium benzoate	Preservative	Prevent growth of microorganism
R	Lecithin // Gelatin	Stabilizer	Makes food have firm/ smooth/ uniform texture

(ii) cancer // intestine ulcer( ulser perut) / stomach ulcer// asthma // aezema // recurring rash

r: hair lost // hyper active

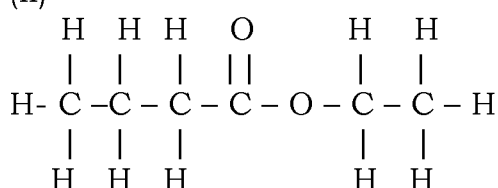
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**[MRSM05-08a]**

(a) (i)

	Function
ascorbic acid	Antioxidants – stop the chemical breakdown, of fats and oils in foods that happen in the presence of oxygen.
sunset yellow	
ethyl butanoate flavour pineapple	Artificial food flavouring

(ii)



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