

PAPER 3

1 (a) 0.3 cm ; 0.2 cm

(b)

Metal block <i>Bongkah logam</i>	Diameter of dent <i>Diameter lekuk</i>			
	1	2	3	Average <i>Purata</i>
Copper <i>Kuprum</i>				
Bronze <i>Gangsa</i>				

(c) (i) The average diameter of dent for bronze is smaller than average diameter of dent for copper.

Nilai purata diameter lekuk untuk gangsa lebih kecil daripada kuprum.

(ii) The smaller the diameter of the dent, the harder and stronger is the material.

Lebih kecil diameter lekuk, lebih keras dan pejal sesuatu bahan.

(d) The presence of foreign atoms into pure metal disrupts its uniform atomic arrangement. Hence, the new disrupted arrangement cannot be sliding between the layers making it stronger. Thus, diameter of dent of bronze will be smaller than copper.

Kehadiran atom-atom asing ke dalam logam asli akan mengganggu susunan atomnya yang seragam. Maka, susunan yang telah terganggu ini tidak boleh menggelongsor antara satu sama lain menyebabkannya lebih keras. Oleh itu, diameter lekuk gangsa akan menjadi lebih kecil daripada kuprum.

(e) When 1 kg weight is dropped on steel ball bearing attached to bronze block, the diameter of dent formed is smaller showing that the bronze is harder.

Apabila pemberat 1 kg dilepaskan ke atas alas bebola keluli yang diletakkan di atas bongkah gangsa, diameter lekuk yang terjadi adalah lebih kecil menunjukkan yang gangsa lebih keras.

(f) (i) Different types of material

Bahan yang berlainan

(ii) Diameter of dent

Diameter lekuk

(iii) Diameter of steel ball bearing, height of the weight and mass of weight

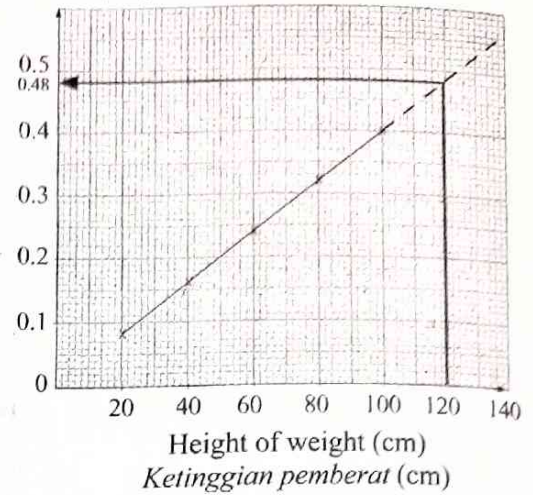
Diameter alas bebola keluli, tinggi pelepasan pemberat dan jisim pemberat

(g) Bronze is harder than copper.

Gangsa lebih keras daripada kuprum.

(h) 0.48 cm

Diameter of the dent (cm)
Diameter lekuk (cm)



(i) Rusting increases if the steel ball bearing is exposed to air for longer time.
Kekaratn akan bertambah sekiranya alas bebola keluli itu didedahkan kepada udara untuk jangka masa yang lebih lama.

(j)

Pure metal <i>Logam tulen</i>	Alloy <i>Aloi</i>
Stanum <i>Timah</i>	Pewter <i>Piuter</i>
Zinc <i>Zink</i>	Brass <i>Logam</i>
Aluminium <i>Aluminium</i>	Duralumin <i>Duralumin</i>

2 Cleaning agent A: Soap

Agen pencuci A: Sabun

Cleaning agent B: Detergent

Agen pencuci B: Detergen

(a) Is the cleansing action of a detergent more effective than soap in hard water?

Adakah kadar pembersihan detergen lebih efektif daripada sabun di dalam air mengandungi mineral?

(b) (i) Manipulated:

Soap and detergent solution

Dimanipulasikan:

Larutan sabun dan detergen

(ii) Responding:

Oily stain on cloth

Bergerak balas:

Kotoran berminyak di atas kain

(iii) Fixed: Volume and concentration of magnesium sulphate solution and volume and concentration of soap solution
Dimalarkan: Isi padu dan kemolaran larutan magnesium sulfat dan isi padu dan kemolaran larutan sabun

(c) The cleansing action of a detergent is more effective than soap in hard water.

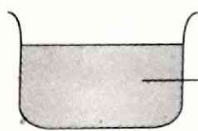
Kadar pembersihan detergen adalah lebih efektif daripada sabun di dalam air yang mengandungi mineral.

(d) Soap solution, detergent solution, magnesium sulphate solution, cloth with oily stains

Larutan sabun, larutan detergen, larutan magnesium sulfat, kain dengan kotoran berminyak

(e) (i) The soap and detergent solution are prepared separately as shown below.

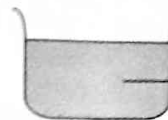
Larutan sabun dan detergen disediakan berasingan seperti di bawah.



Beaker P
Bikar

Soap solution added with hard water (magnesium sulphate solution)

Larutan sabun bercampur air mengandungi mineral (larutan magnesium sulfat)



Beaker Q
Bikar

Detergent solution added with hard water (magnesium sulphate solution)

Larutan detergen bercampur air mengandungi mineral (larutan magnesium sulfat)

(ii) A small piece of cloth with oily stains is dipped into each beaker.

Sekeping kain berminyak dimasukkan ke dalam setiap bikar.

(iii) Each cloth is washed with soap or detergent in each beaker.

Setiap kain dibersihkan dengan sabun atau detergen di dalam bikar.

(iv) The cleansing action of the soap and detergent is observed, compared and recorded.

Kadar pembersihan sabun dan detergen diperhatikan, dibanding dan direkod.

(f)

Beaker/Bikar	Observation/Pemerhatian
P	
Q	