

amazing
FIZIK!

@amazingPhysics_cgalinainanarif

PHYSICS

BY CHAPTER F4 & F5

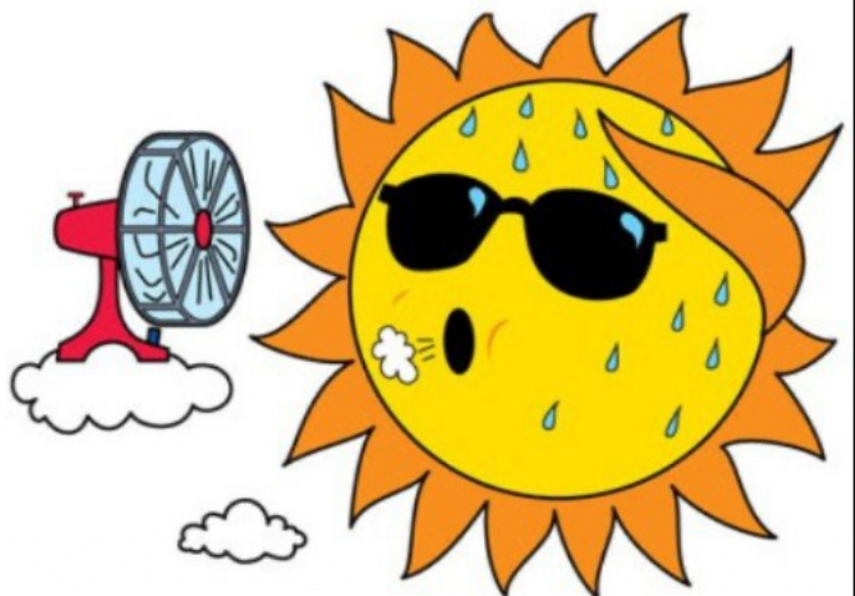
F4 CH4: HEAT

COMPILATION OF **OBJECTIVE** QUESTIONS



**DREAM BIG
AIM HIGH
NEVER GIVE UP**

alinainanarif



- 3 Rajah 2 menunjukkan suatu susunan radas untuk mengkaji hubungan antara isipadu turus udara, V dan suhu, T bagi suatu jisim udara yang malar.
 Diagram 2 shows an arrangement of apparatus to investigate the relationship between the volume of air column, V and the temperature, T for a fixed mass of air.

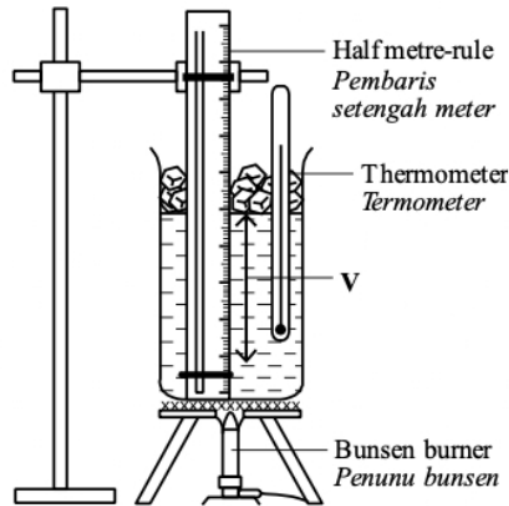
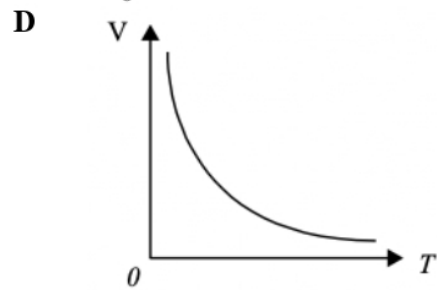
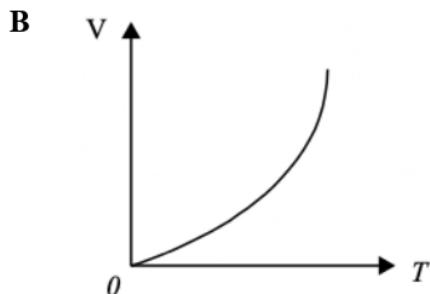
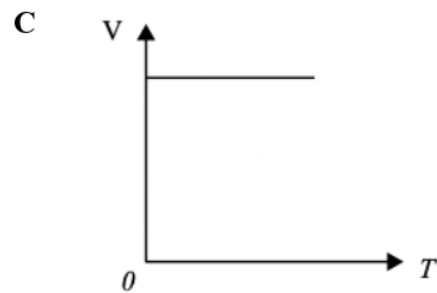
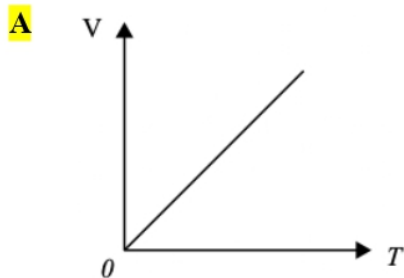
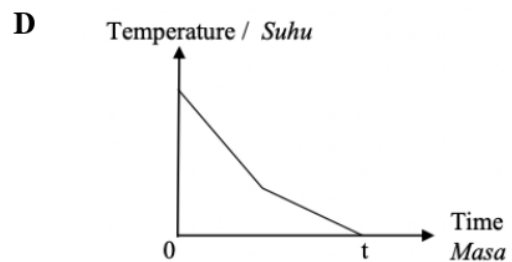
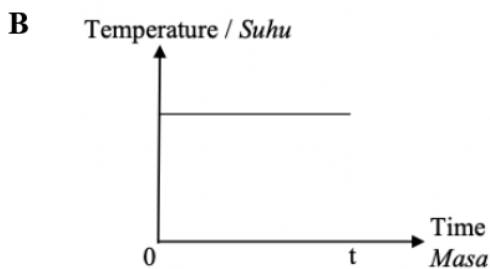
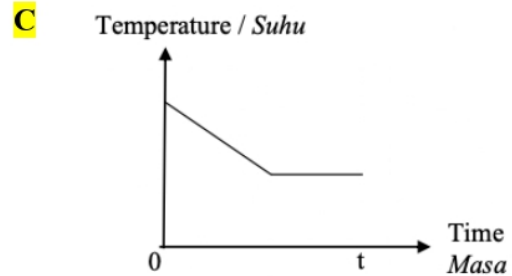
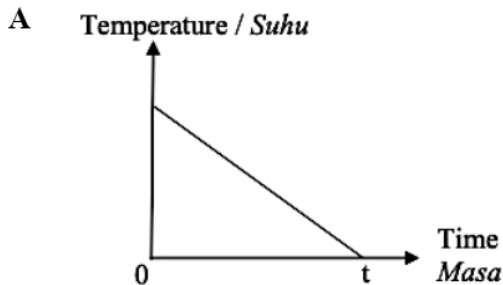


Diagram 2

Graf yang manakah menunjukkan hubungan V dengan T , di mana T ialah suhu dalam unit Kelvin?
 Which of the following graphs shows the relationship between V and T , where T is temperature measured in Kelvin?



- 4 Satu cawan kopi panas dibiarkan menyejuk dalam udara.
 Graf manakah yang menunjukkan perubahan suhu kopi panas itu selepas masa t ?
A cup of hot coffee is left to cool in the air.
Which graph shows the change of temperature of the hot coffee after time t ?



- 5 Rajah 3.1 menunjukkan 100 g logam X direndam dalam 200 g air mendidih selama 10 minit.
 Rajah 3.2 menunjukkan logam X itu dipindahkan ke dalam 200 g minyak dengan suhu awal 30°C.
Diagram 3.1 shows that 100 g metal X immersed in 200 g boiling water for 10 minutes.
Diagram 3.2 shows metal X transferred into 200 g oil with initial temperature 30°C.

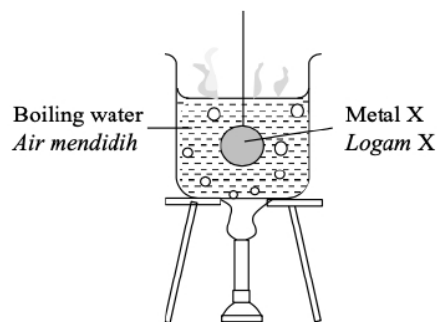


Diagram 3.1

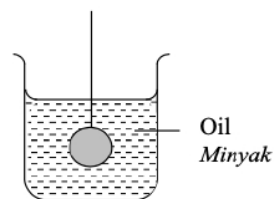


Diagram 3.2

Apakah suhu akhir minyak itu?
What is the final temperature of oil?

- A** Kurang daripada 30°C
Less than 30°C
- B** Lebih daripada 30°C
More than 30°C
- C** Lebih besar daripada 100°C
Greater than 100°C
- D** Di antara 30°C dan 100°C
Between 30°C and 100°C

- 6 Rajah 4 menunjukkan tiga blok P, Q dan R yang sama jisim. Kuantiti tenaga haba yang sama dibekalkan kepada blok-blok itu.
 Diagram 4 shows three blocks P, Q and R, with the same mass. The same quantity of heat energy is applied to the blocks.



Diagram 4

Peningkatan suhu dalam blok R lebih tinggi daripada P, tetapi kurang daripada Q.
 Blok manakah mempunyai muatan haba tentu paling rendah?
 The temperature rises in block R higher than P, but less than Q.
 Which block has the lowest specific heat capacity?

- A P
- B Q**
- C R

- 7 Rajah 5 menunjukkan lengkung pemanasan suatu bahan pepejal.
 Diagram 5 shows a heating curve of a solid substance.

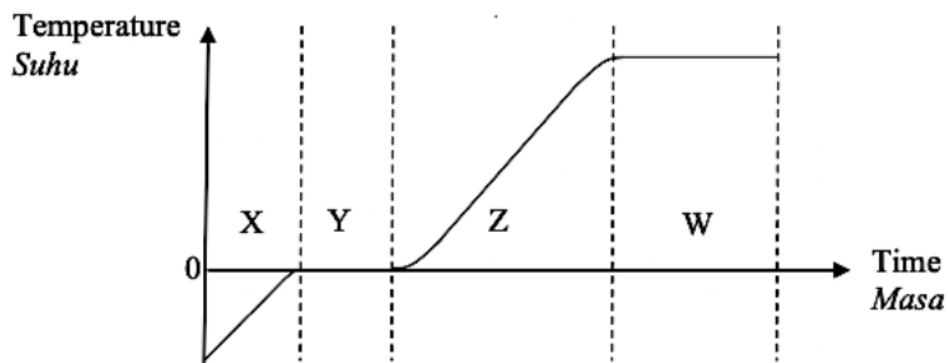
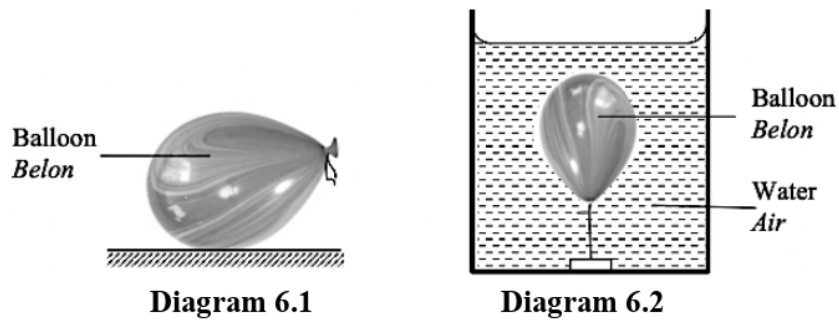


Diagram 5

Pada peringkat Y, haba yang diserap oleh objek ialah
 At stage Y, the heat absorb by the object is

- | | | | |
|---|---|----------|--|
| A | sifar
zero | C | haba pendam pelakuran
latent heat of fusion |
| B | haba pendam pengewapan
latent heat of vaporization | D | muatan haba tentu
specific heat capacity |

- 8 Rajah 6.1 menunjukkan saiz sebuah belon di udara.
Rajah 6.2 menunjukkan belon yang sama ditenggelamkan ke dalam air.
Diagram 6.1 shows the size of the balloon in the air.
Diagram 6.2 shows the same balloon submerged in the water.



Hukum fizik apakah yang menerangkan situasi di atas?
Which physics law explains the situation above?

- | | |
|--|--|
| A Hukum Snell
<i>Snell's law</i> | C Hukum Charles
<i>Charles' law</i> |
| B Hukum Boyle
<i>Boyle's law</i> | D Hukum Gay-Lussac
<i>Gay-Lussac's law</i> |
- 9 Rajah 7 menunjukkan sebuah termometer digunakan untuk mengukur suhu pesakit.
Diagram 7 shows a thermometer is used to measure the temperature of patient.



Konsep manakah yang menerangkan prinsip kerja termometer?
Which concept explains the working principle of the thermometer?

- | | |
|---|---|
| A Muatan haba tentu
<i>Specific heat capacity</i> | C Sentuhan terma
<i>Thermal contact</i> |
| B Keseimbangan terma
<i>Thermal equilibrium</i> | D Pemindahan haba
<i>Heat transfer</i> |

- 10 Rajah 8.1 menunjukkan ketulan ais sedang melebur.
 Rajah 8.2 menunjukkan air sedang mendidih di dalam sebuah bekas kaca.
Diagram 8.1 shows a cube of ice melting.
Diagram 8.2 shows water boiling in a glass container.



Diagram 8.1



Diagram 8.2

Pasangan manakah yang betul bagi kedua-dua situasi?
Which pair is correct for both situation?

	Suhu ais melebur <i>Temperature of the melting ice</i>	Suhu air mendidih <i>Temperature of boiling water</i>
A	Seragam <i>Constant</i>	Seragam <i>Constant</i>
B	Seragam <i>Constant</i>	Bertambah <i>Increasing</i>
C	Bertambah <i>Increasing</i>	Seragam <i>Constant</i>
D	Bertambah <i>Increasing</i>	Bertambah <i>Increasing</i>

- 11 Sebiji belon dibiarkan di bawah cahaya matahari sehingga isipadunya bertambah.
 Antara berikut, yang manakah betul mengenai jisim udara dan tenaga kinetik molekul uadara di dalam belon itu?
A balloon is put under the sun until the volume is increased.
Which of the following is correct about the mass and the kinetic energy of the air molecules inside the balloon?

	Jisim udara <i>Mass of the air</i>	Tenaga kinetik molekul <i>Kinetic energy of the air molecules</i>
A	Bertambah <i>Increases</i>	Bertambah <i>Increases</i>
B	Tidak berubah <i>Unchanged</i>	Tidak berubah <i>Unchanged</i>
C	Bertambah <i>Increases</i>	Tidak berubah <i>Unchanged</i>
D	Tidak berubah <i>Unchanged</i>	Bertambah <i>Increases</i>

- 12 Rajah 9 menunjukkan radas yang digunakan untuk mengkaji hukum gas.
Diagram 9 shows an apparatus to investigate gas law.

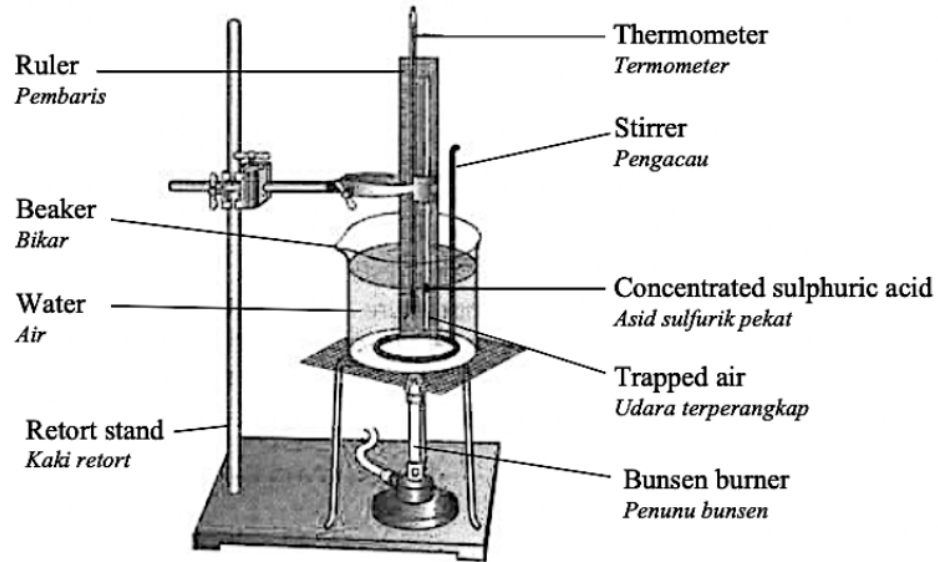


Diagram 9

Hukum gas manakah yang menggunakan set radas seperti di atas?
Which gas law uses the apparatus as above?

- A Hukum Boyle / *Boyle's law*
 - B** Hukum Charles / *Charles' law*
 - C Hukum Gay-Lussac / *Gay-Lussac's law*
- 13 Rajah 10 menunjukkan seorang budak lelaki memegang sebatang bunga api.
Diagram 10 shows a boy holding a sparkling firework.



Diagram 10

Percikan bunga api yang jatuh ke atas tangan budak itu tidak menyebabkan lecuran yang teruk kerana percikan bunga api

The spark from the firework which falls on the boy's hand does not produce bad burns because the spark

- A membebaskan cahaya, bukan haba / *releases light, not heat*
- B berada pada suhu yang rendah / *is at a lower temperature*
- C** mengandungi jumlah haba yang sedikit / *contains a small amount of heat*
- D mempunyai muatan haba tentu yang rendah / *has a low specific heat capacity*

- 14 Rajah 11 menunjukkan pembentukan bayu darat.
Diagram 11 shows the formation of a land breeze.

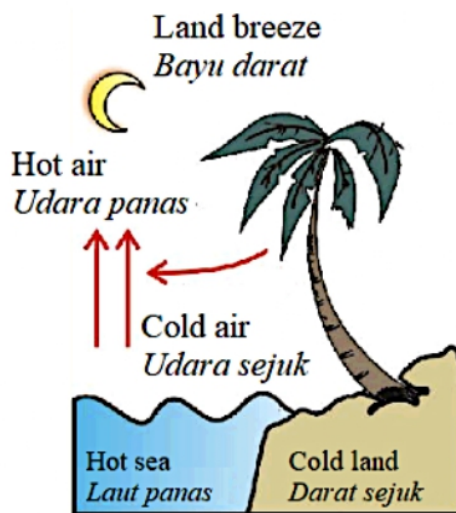


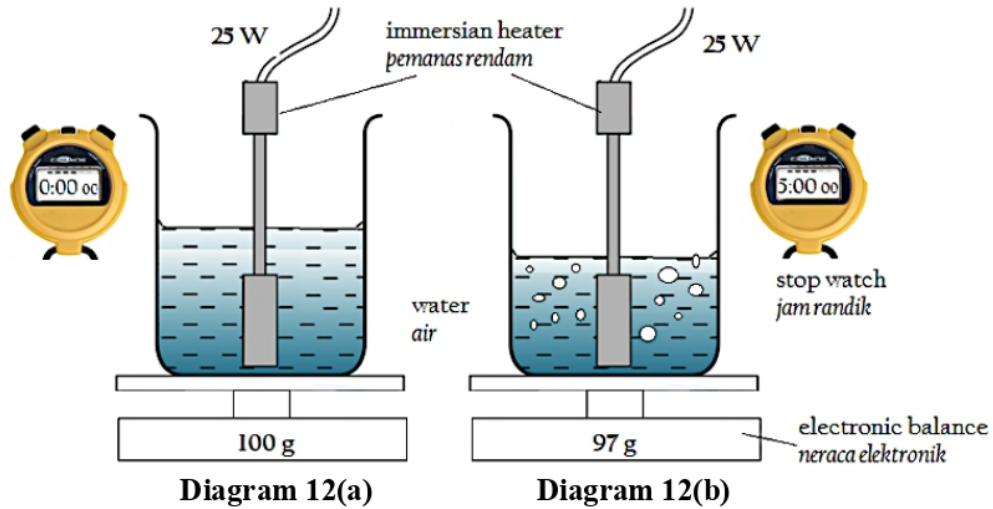
Diagram 11

Antara pernyataan berikut, yang manakah betul?

Which of the following statements is correct?

- A Tekanan di laut lebih tinggi daripada di atas laut
The pressure of the sea is higher than that of the land
- B Ketumpatan udara di atas permukaan darat kurang daripada ketumpatan udara di atas permukaan air laut
The density of air above the land is less than that of above sea water
- C Suhu darat menjadi lebih tinggi daripada suhu air laut
The temperature of the land becomes higher than the temperature of the sea water
- D** Muatan haba tentu air laut lebih tinggi daripada muatan haba tentu darat
The specific heat capacity of the sea water is higher than the specific heat capacity of the land

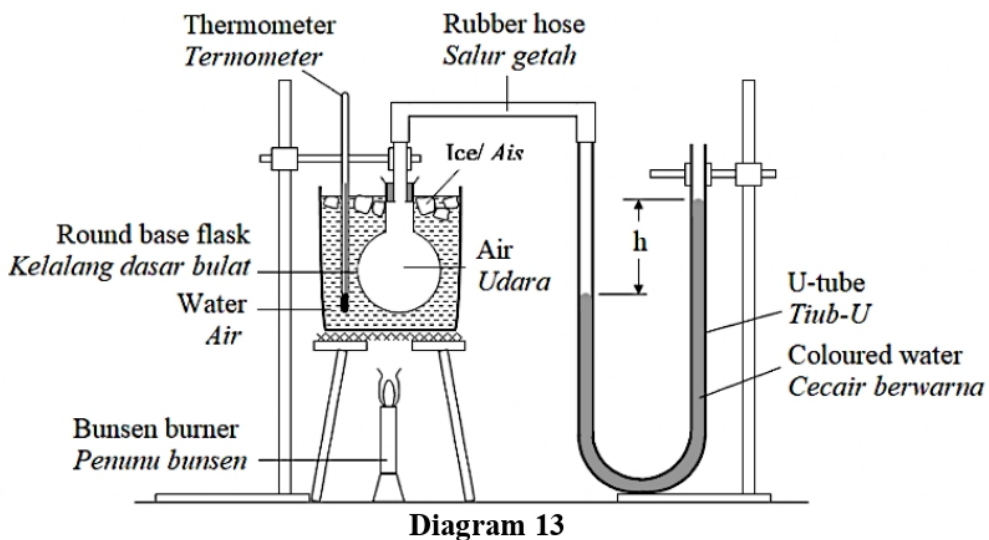
- 15 Rajah 12(a) menunjukkan sejumlah air dipanaskan berterusan menggunakan pemanas rendam. Rajah 12(b) menunjukkan air itu selepas 5 minit dipanaskan.
 Diagram 12(a) shows an amount of water is heated continuously using an immersion heater.
 Diagram 12(b) shows the water after being heated for 5 minutes.



Berdasarkan rajah-rajah dan maklumat yang diberi, tentukan haba pendam pengewapan air.
 Based on the diagrams and the information given, determine the specific latent heat of vapourisation of water.

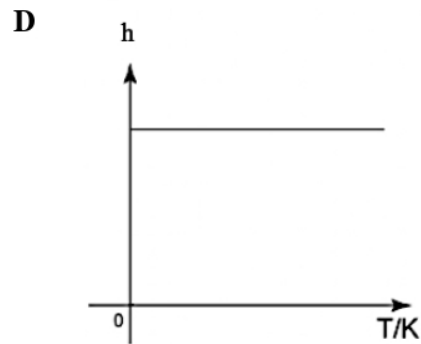
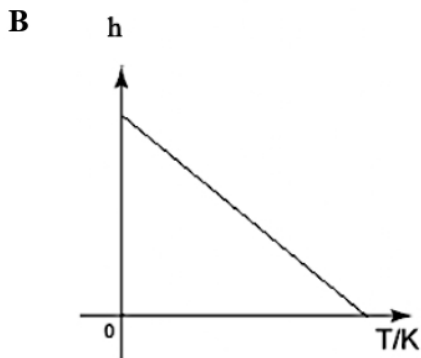
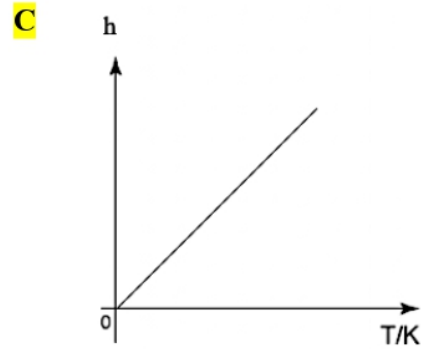
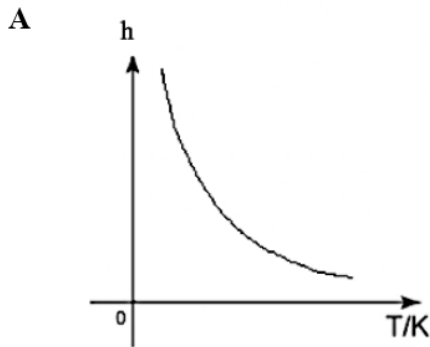
- A $1.3 \times 10^3 \text{ Jkg}^{-1}$ C $7.7 \times 10^4 \text{ Jkg}^{-1}$
 B $4.2 \times 10^4 \text{ Jkg}^{-1}$ **D** $2.5 \times 10^6 \text{ Jkg}^{-1}$

- 16 Rajah 13 menunjukkan satu susunan radas untuk mengkaji Hukum Guy Lussac.
 Diagram 13 shows an arrangement of apparatus used to investigate Guy Lussac's Law.



Graf manakah yang menunjukkan hubungan antara perbezaan paras air, h , dan suhu mutlak, T , bagi suatu gas berjisim tetap pada isipadu malar?

Which graph shows the relationship between difference in height of water levels, h , and the absolute temperature, T , for a fixed mass of gas at constant volume.



- 17 “Muatan haba tentu logam Q ialah $830 \text{ J kg}^{-1}\text{C}^{-1}$.” Kenyataan ini bermaksud
 “The specific heat capacity of metal Q is $830 \text{ J kg}^{-1}\text{C}^{-1}$.” The statement means that

- A** 830 J haba diperlukan untuk meleburkan 1 kg logam Q.
 830 J of heat is required to melt 1 kg of metal Q.
- B** 830 J haba diperlukan untuk menaikkan suhu logam Q sebanyak 1°C .
 830 J of heat is required to increase the temperature of metal Q by 1°C .
- C** 830 J haba diperlukan untuk menaikkan 1 g logam Q dari 0°C ke 100°C .
 830 J of heat is required to increase 1 g of metal Q from 0°C to 100°C .
- D** 830 J haba diperlukan untuk menaikkan suhu 1 kg logam Q sebanyak 1°C .
 830 J of heat is required to increase the temperature of 1 kg of metal Q by 1°C .

- 21 Rajah 14 menunjukkan graf tekanan melawan suhu untuk jisim gas yang tetap
Diagram 14 shows a pressure against temperature graph for a fixed mass of gas.

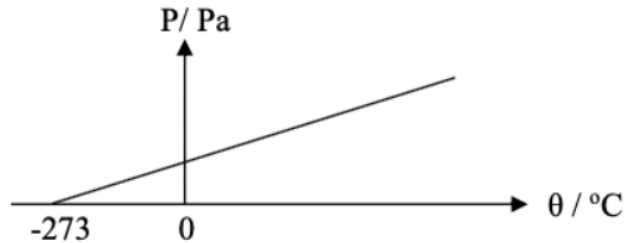


Diagram 14

Hukum gas manakah yang diwakili oleh graf tersebut?
Which of the following gas laws represent the graph?

- A Hukum Boyle / *Boyle's law*
 - B Hukum Charles / *Charles' law*
 - C** Hukum Gay-Lussac / *Gay-Lussac's law*
- 22 Rajah 15 menunjukkan satu sfera logam yang panas direndam di dalam air sejuk pada suhu 0°C.
Diagram 15 shows a hot metal sphere immersed in cold water at 0°C.

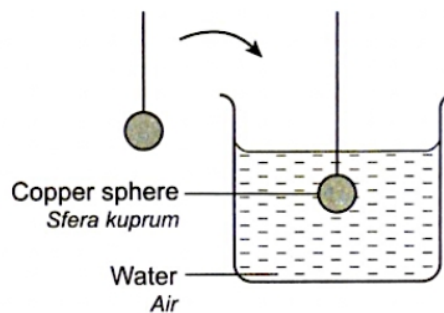


Diagram 15

Keseimbangan terma tercapai apabila
Thermal equilibrium is reached when the

- A suhu sfera > suhu air
temperature of sphere > temperature of the water
- B suhu sfera < suhu air
temperature of sphere < temperature of the water
- C** suhu sfera = suhu air
temperature of sphere = temperature of the water
- D sfera mula melebur
sphere begins to melt

TING. 4: BAB 4 HABA (HEAT)

- 23 Cecair 500 g pada suhu 90°C dicampurkan dengan cecair lain yang sama jenis dengan jisim M g pada suhu 40°C . Suhu akhir air ialah 60°C .
Apakah nilai M ?
*500 g of a liquid at 90°C is mixed with another liquid of the same type of mass M g at 40°C .
The final temperature of the mixture is 60°C .
What is the value of M ?*
- A 240
B 640
C 750
D 840
- 24 Berapakah haba yang dibebaskan apabila 1 g stim dikondensasikan kepada air pada suhu 100°C ?
[Haba pendam tentu pengewapan air = $2.26 \times 10^6 \text{ J kg}^{-1}$]
*How much heat is released when 1g of steam condenses to water at 100°C ?
[Specific latent heat of vaporization of water = $2.26 \times 10^6 \text{ J kg}^{-1}$]*
- A 20 J
B 226 J
C 2 260 J
D 22 600 J
- 25 Tekanan gas dalam sebuah tayar kereta sebelum memulakan perjalanan ialah 28kPa dan suhunya ialah 27°C . Selepas suatu perjalanan jauh didapati tekanan gas di dalam tayar itu menjadi 33 kPa. Berapakah suhu gas di dalam tayar selepas perjalanan itu?
*The gas pressure in a car tyre is 28 kPa before the start of a journey and the temperature is 27°C .
After a long journey, the gas pressure in the car tyre becomes 33 kPa.
What is the temperature of the gas in the tyre?*
- A 22.91°C
B 31.82°C
C 27.00°C
D 80.57°C
- 26 Apakah yang berlaku semasa peleburan naftalena?
What occur during melting of naphthalene?
- A Haba dibebaskan oleh naftalena
Heat is released by the naphthalene.
B Suhu naftalena bertambah
Temperature of naphthalene increases.
C Daya ikatan di antara molekul-molekul naftalena bertambah.
The bonding force between the naphthalene molecules.
D Tenaga kinetik molekul-molekul naftalena adalah tetap.
The kinetic energy of the naphthalene remains constant.

- 27 Rajah 16 menunjukkan periuk yang mempunyai tapak Aluminium.
 Diagram 16 shows a pot with Aluminium base.



Diagram 16

Apakah yang terjadi kepada masa memasak makanan jika tapak periuk tersebut digantikan dengan Kuprum?

[Muatan haba tentu Aluminium = $900 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$]

[Muatan haba tentu Kuprum = $390 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$]

What happen to the time to cook the food if the base of the pot is replaced with Copper?

[Specific heat capacity of Aluminium = $900 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$]

[Specific heat capacity of Copper = $\text{J kg}^{-1} \text{ }^\circ\text{C}^{-1}$]

- A Bertambah / Increase
 - B** Berkurang / Decrease
 - C Kekal sama / Remain the same
- 28 Rajah 17 menunjukkan graf pemanasan suhu, θ melawan masa, t bagi bahan X.
 Diagram 17 shows a heating graph of temperature, θ against time, t for substance X.

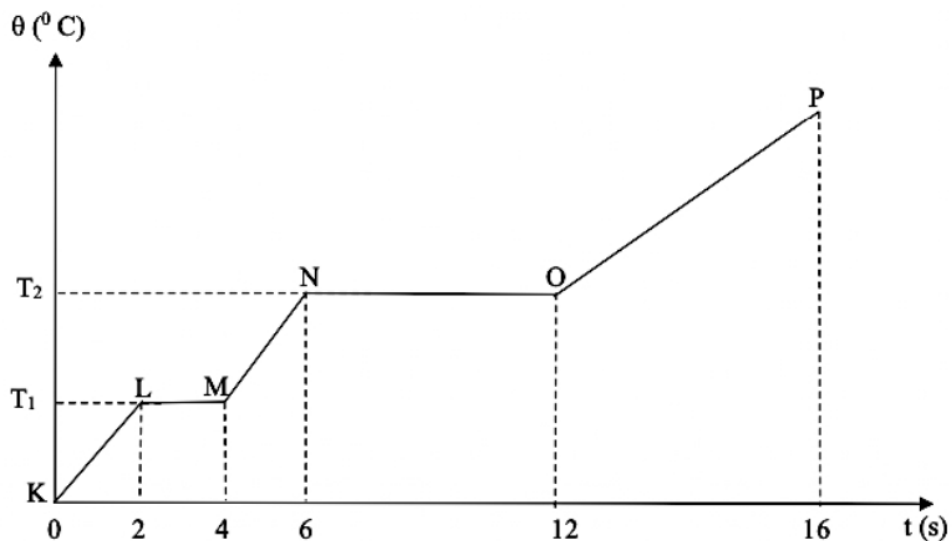


Diagram 17

Pernyataan manakah yang benar?

Which statement is correct?

- A** Haba yang dibekalkan semasa NO digunakan untuk mengatasi daya tarikan antara molekul - molekul.
Heat supplied during NO is used to overcome force of attraction between molecules.
- B** Haba yang dibekalkan semasa LM digunakan untuk meningkatkan suhu bahan.
Heat supplied during LM is used to increase the temperature of the substance.
- C** Haba yang dibekalkan semasa MN dipanggil haba pendam tentu pelakuran.
Heat supplied during MN is called specific latent heat of fusion.
- D** Semasa OP, purata tenaga kinetik molekul adalah malar.
During OP, average kinetic energy of molecules are constant.

- 29 Diagram 18 menunjukkan lengkung pemanasan bagi suatu cecair.
Diagram 18 shows the heating curve of a liquid.

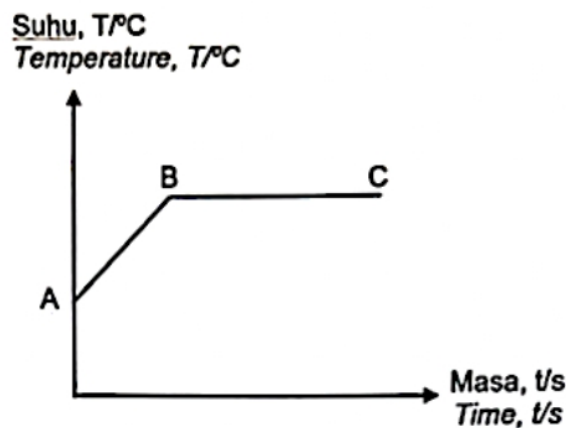


Diagram 18

Pernyataan yang manakah menerangkan apa yang berlaku di bahagian BC?

Which statement explains what happens in section BC?

- A** Haba pendam pelakuran dibebaskan
Latent heat of fusion is released
- B** Tiada haba diserap oleh cecair
No heat is absorbed by the liquid
- C** Tenaga kinetik molekul bertambah
Kinetic energy of the molecules increases
- D** Cecair mengalami perubahan fasa daripada cecair kepada gas
The liquid experiences a change of a phase from liquid to gas

- 30 Rajah 19 menunjukkan ketulan ais dipanaskan menggunakan pemanas elektrik berkuasa 50 Watt selama 60 saat.

Diagram 19 shows ice cubes being heated by an electrical heater with the power 50Watt within 60 second.

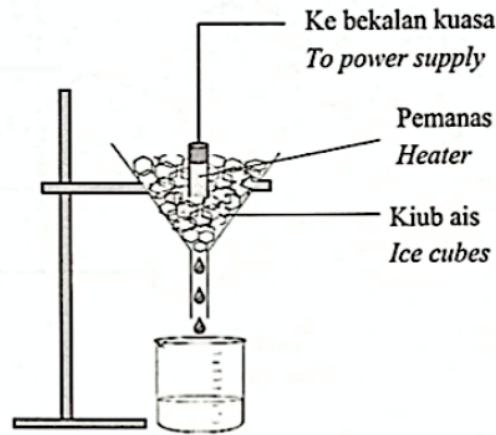


Diagram 19

Hitung jisim ais yang telah melebur.

[Haba pendam tentu pelakuran = $3.3 \times 10^5 \text{ J kg}^{-1}$]

Calculate the mass of ice cubes that have melted.

[*Specific latent heat of fusion = $3.3 \times 10^5 \text{ J kg}^{-1}$*]

- | | | | |
|----------|----------------------------------|---|----------------------------------|
| A | $1.45 \times 10^3 \text{ kg}$ | C | $1.10 \times 10^{-2} \text{ kg}$ |
| B | $9.09 \times 10^{-3} \text{ kg}$ | D | $9.90 \times 10^8 \text{ kg}$ |
- 31 Rajah 20 menunjukkan sebuah radiator kereta. Air digunakan sebagai agen penyejuk dalam radiator.
Diagram 20 shows a radiator of car. Water is used as a cooling agent in the radiator.

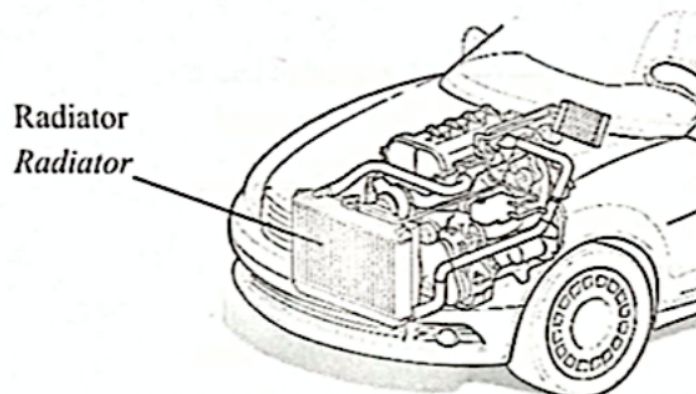


Diagram 20

TING. 4: BAB 4 HABA (HEAT)

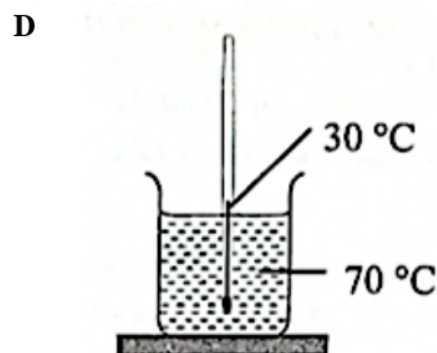
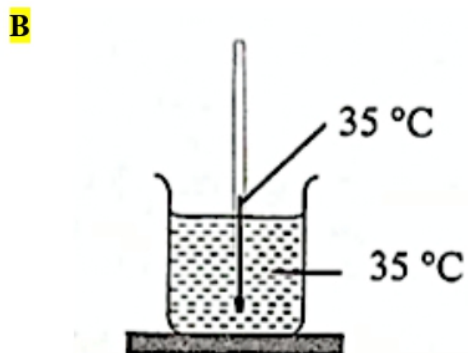
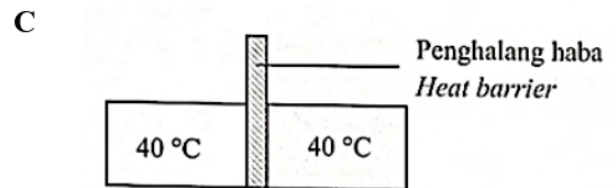
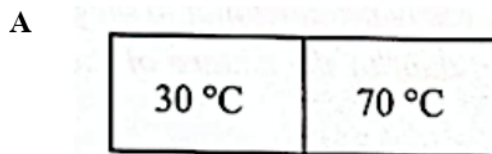
Kombinasi manakah yang betul untuk menerangkan mengapa air sesuai digunakan sebagai ejen penyejuk dalam radiator kereta?

Which combination is correct to explain why the water is suitable to be used as a cooling agent?

	Muatan haba tentu air <i>Specific heat capacity of water</i>	Penerangan <i>Explanation</i>
A	Tinggi <i>High</i>	Cepat serap haba <i>Absorb heat quickly</i>
B	Rendah <i>Low</i>	Lambat serap haba <i>Slow heat absorption</i>
C	Tinggi <i>High</i>	Menyerap lebih haba dengan kenaikan suhu yang rendah <i>Absorb more heat in low temperature rise</i>
D	Rendah <i>Low</i>	Menyerap lebih haba dengan kenaikan suhu yang tinggi <i>Absorb more heat in high temperature rise</i>

32 Situasi manakah yang menunjukkan konsep keseimbangan terma?

Which situation shows the concept of thermal equilibrium?



- 33 Rajah 21 menunjukkan sebuah termometer makmal.
Diagram 21 shows a laboratory thermometer.

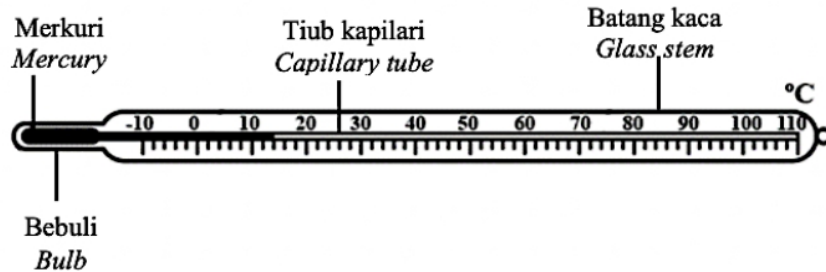


Diagram 21

Manakah antara pengubahsuaian berikut akan meningkatkan kepekaan termometer?
Which modification will increase the sensitivity of the thermometer?

- A Menggunakan satu bebuli berdinding lebih tebal.
Using a bulb with a thicker wall.
 - B Menggunakan satu tiub kapilari yang lebih panjang.
Using a longer capillary tube.
 - C Menggunakan satu batang kaca berdinding lebih tebal.
Using a glass stem with a thicker wall.
 - D** Menggunakan tiub kapilari yang berdiameter lebih kecil.
Using a smaller diameter of capillary tube.
- 34 Rajah 22 menunjukkan suatu lengkung pemanasan suatu bahan pepejal.
Diagram 22 shows a heating curve for a solid substance.

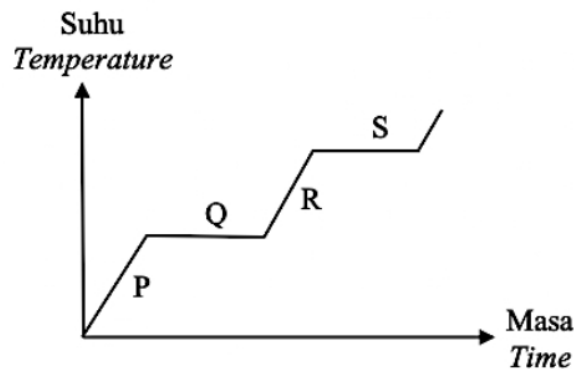


Diagram 22

Haba diserap bagi melemahkan dan memutuskan ikatan antara molekul pada
Heat is absorbed to weaken and break the bonds between molecules

- A P dan R
- B** Q dan S
- C R dan S
- D Q dan R

- 35 Apabila berlaku pembekuan air, perkara berikut akan berlaku
When there is freezing of water, the following situation will occur
- A Suhu air naik / *Temperature of water rises*
 - B Suhu air turun / *Temperature of water decreases*
 - C** Suhu air tidak berubah / *Temperature of water is constant*
- 36 Suhu sifar mutlak adalah suhu di mana molekul-molekul gas secara teori
Absolute zero is the temperature at which gas molecules theoretically
- A** tiada langsung isipadu
occupy no volume at all
 - B bergerak paling laju
move the fastest
 - C bacaan suhu adalah 273 °C
Temperature reading is 273 °C
 - D mengandungi dua kali bilangan molekul pada suhu bilik
contain twice the number of molecules at room temperature
- 37 Kadar penyejatan air dalam bekas boleh dikurangkan dengan meletakkan bekas
The rate of evaporation of water in a container can be reduced by placing the container
- A di dalam ruang pada suhu bilik / *in a closed room.*
 - B di dalam sebuah ketuhar yang panas / *in a hot oven.*
 - C** di dalam sebuah bilik yang berhawa dingin / *in an air-conditioned room*
 - D di bawah kipas yang sedang berputar / *under the spinning fan.*
- 38 Rajah 23 menunjukkan seekor ikan yang merupakan haiwan poikiloterma.
 Haiwan poikiloterma merupakan haiwan yang mempunyai suhu badan yang berubah-ubah mengikut suhu persekitaran.
Diagram 23 shows a fish which is a poikilothermic animal.
Poikilothermic animals are animals which body temperature changes according to the temperature of the environment.



Diagram 23

Apakah konsep fizik yang berkaitan dengan situasi diatas?
What is the physics concept related to the above situation?

- | | |
|---|---|
| <p>A Keseimbangan terma
 <i>Thermal equilibrium</i></p> <p>B Muatan haba tentu
 <i>Specific heat capacity</i></p> | <p>C Haba pendam tentu peralihan
 <i>Specific latent heat of fusion</i></p> <p>D Haba pendam tentu pengewapan
 <i>Specific latent heat of evaporation</i></p> |
|---|---|

- 39 Rajah 24 menunjukkan sekumpulan lembu sedang berehat di atas jalan tar pada waktu malam.
Diagram 24 shows a herd of cattle resting on a tarred road at night.

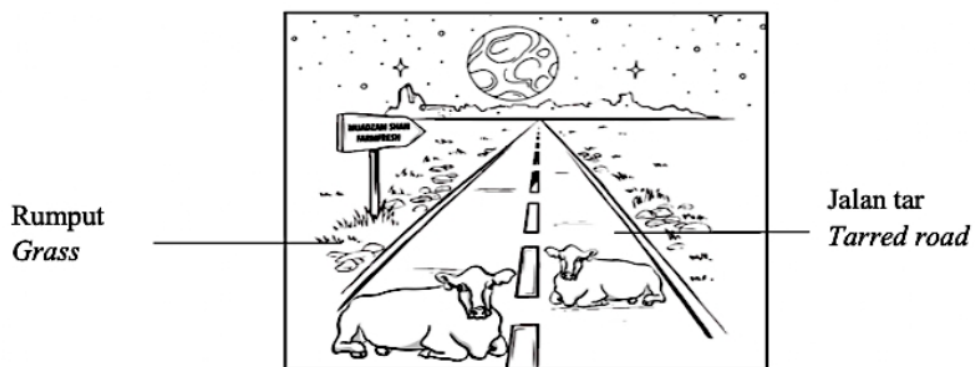


Diagram 24

Mengapakah pada waktu malam lembu lebih suka berehat di atas jalan tar berbanding di atas rumput.

Why at night cows prefer to rest on tar roads than on grass.

- A** Muatan haba tentu jalan tar lebih tinggi menyebabkan jalan lebih panas berbanding rumput
The specific heat capacity of the tarred road is higher causing the road to be hotter than the grass
- B** Muatan haba tentu jalan tar lebih rendah menyebabkan jalan lebih panas berbanding rumput
The specific heat capacity of the tarred road is lower causing the road to be hotter than the grass
- C** Muatan haba tentu rumput yang lebih tinggi menyebabkan rumput lebih sejuk berbanding jalan tar
The higher specific heat capacity of the grass causes the soil to be cooler than the tar road
- D** Muatan haba tentu rumput lebih rendah menyebabkan rumput lebih panas berbanding jalan tar
The specific heat capacity of the grass is lower causing the soil to be hotter than the tar road

- 40 Rajah 25 menunjukkan graf suhu melawan masa bagi satu blok logam berjisim 1 kg yang dipanaskan oleh satu pemanas berkuasa 50 W selama 120 s.
 Diagram 25 shows a graph of temperature against time of a metal block of mass 1 kg being heated by a heater which rated at 50 W for 120 s.

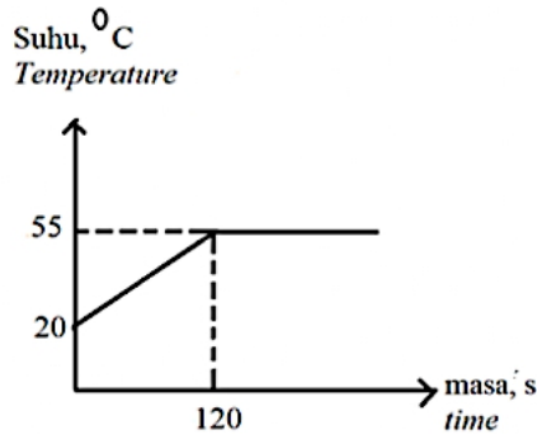


Diagram 25

Hitung muatan haba tentu blok logam tersebut?
 Calculate the specific heat capacity of the metal block?

- | | | | |
|----------|--|----------|---|
| A | 109.09 J kg ⁻¹ °C ⁻¹ | C | 300.00 J kg ⁻¹ °C ⁻¹ |
| B | 171.43 J kg ⁻¹ °C ⁻¹ | D | 6000.00 J kg ⁻¹ °C ⁻¹ |

When you can't make them see the LIGHT, make them feel the HEAT!!!

Ronald Reagan-