Answer all questions.
Jawab semua soalan.

Question 1
Soalan 1

Another name for Vitamin C, a nutrient found in fresh fruits and vegetable is called Ascorbic Acid. Among good sources of Vitamin C are citrus fruits like oranges, lemons, limes and grapefruits, berries, tomatoes, green peppers, cabbage, broccoli and spinach. Currently the recommended dietary allowance (RDA) for vitamin C is 50-60 mg/day for adults; 35 mg/day for infants; 40-45 mg/day for children.

Stein, Jay H. "Ascorbic Acid(Vitamin C) Deficiency." *In Internal Medicine*. St Louis: Mosby 1998

Nama lain bagi Vitamin C, nutrien yang dijumpai di dalam buah-buahan segar dan sayur-sayuran dipanggil Asid Askorbik. Antara sumber Vitamin C adalah buah-buahan sitrus seperti oren, limau, dan anggur, beri, tomato, cili hijau, kobis, brokoli dan bayam. Buat masa ini, jumlah pemakanan cadangan (RDA) untuk Vitamin C adalah 50-60 mg/hari untuk dewasa; 35mg/hari untuk bayi; 45mg/hari untuk kanak-kanak.

Stein, Jay H. "Ascorbic Acid(Vitamin C) Deficiency." *In Internal Medicine*. St Louis: Mosby 1998

A group of students were provided with article above as guidance for them to conduct an experiment to investigate the percentage of Vitamin C in different types of vegetables. They believe that vegetables contain higher percentage of Vitamin C compared to fruits.
Sekumpulan pelajar telah dibekalkan dengan artikel di atas sebagai panduan untuk mereka menjalankan sebuah eksperimen untuk menyiasat peratus Vitamin C dalam jenis sayuran yang berbeza. Mereka percaya bahawa sayur-sayura mempunyai peratusan Vitamin C yang lebih tinggi berbanding buah-buahan

The following steps were carried out.
Step 1: 20 grams of Cauliflower are blended with 20 ml of distilled water using a blender in 30 seconds

Step 2 : Suspension is filtered and the filtrate is collected. Fill a syringe with needle with 5 ml of Cauliflower filtrate and leaf it a side.

Step 3 : 1 ml of DCPIP solution is measured using measuring cylinder and pour it into a specimen tube

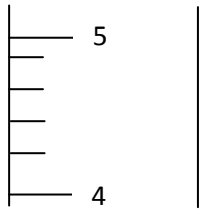
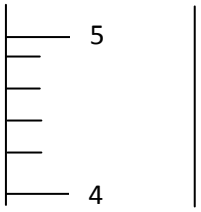
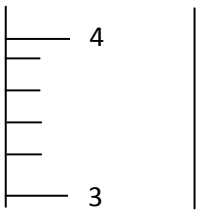
Step 4: By using the syringe prepared in Step 2, deep in the needle in to the solution and pour in the Cauliflower filtrate in to 1ml DCPIP solution in the specimen tube.

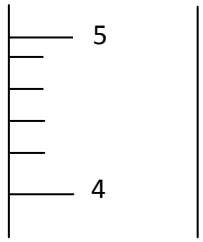
Step 5: By using the needle, stir the solution slowly until it is decolorized.

Step 6: Measure and record the final reading of the syringe.

Step 7: Repeat Step 1-6 by using Broccoli and Lime. While repeat Step 2-6 by replacing filtrate with Ascorbic Acid.

The results of the experiment are shown in Table 1
Keputusan eksperimen ditunjukkan dalam Jadual 7.

Type of Filtrate *Jenis Hasil Turasan*	Final Reading *Bacaan Akhir*	Amount of filtrate used to decolorize 1ml DCPIP solution (ml) *Jumlah hasil turasan yang digunakan untuk menyahwarna 1ml larutan DCPIP (ml)*
A (Cauliflower)		
B (Broccoli)		
C (Lime)		

D (Ascorbic Acid)		

(a) Record the amount of filtrate used to decolorize 1 ml DCPIP solution in Table 1.
Rekod jumlah hasil turasan yang digunakan untuk mennyahwarna 1 ml larutan DCPIP dalam Jadual 1

(b) i) State two different observations based on Table 1.
Nyatakan pemerhatian yang berbeza berdasarkan Jadual 1

Observation 1/ *Pemerhatian 1*

_____

_____

_____

Observation 2/ *Pemerhatian 2*

_____

_____

_____

ii) State two inferences based on observations made in 1(b).

Inference 1/ *Inferens 1*

_____

_____

_____

Inference 2/ *Inferens 2*

_____

_____

_____

(c) Complete Table 2 based on the experiment.

Lengkapkan Jadual 2 berdasarkan eksperimen.

Variable *Pembolehubah*	Method to handle the variables *Cara mengendali pembolehubah*
Manipulated variable *Pembolehubah dimanipulasikan* ……..... …… ……	 …… …….. ……
Responding variable *Pembolehubah bergerak balas* …… …… ……	 …… …… ……
Constant Variable *Pembolehubah dimalarkan* …… …… ……..	 …… …… ……

(d) State the hypothesis of this experiment

Nyatakan hipotesis eksperimen ini

_____

_____

_____

_____

(e) i) Construct a table and record all the data collected in this experiment.

Your table should have following titles:-

Bina satu jadual dan rekod semua data yang dikumpulkan dalam eksperimen

Jadual anda hendaklah mengandungi tajuk-tajuk berikut:-

- Types of fruit juices/ vegetables

  Jenis Jus buah/ sayuran
- Amount of fruit juices/ vegetables filtrate needed to decolorize 1 ml DCPIP solution

  Jumlah jus buah/ hasil tapisan sayuran yang diperlukan untuk menyahwarna 1 ml larutan DCPIP
- Percentage of Vitamin C in each specimen

  Peratusan Vitamin C dalam setiap specimen

Percentage of Vitamin C

$$= \frac{\text{Amount of Ascorbic Acid needed to decolorize DCPIP solution}}{\text{Amount of Fruit Juice/ Vegetables Filtrate needed to decolorize DCPIP solution}} \times 0.1\%$$

ii) Use data from 1 (e) i) draw a bar chart of Type of vegetable filtrate against percentage of Vitamin C.
Dengan menggunakan data dari 1 (e) i), lukiskan carta bar jenis tapisan sayuran melawan peratusan Vitamin C.

(f) Based on the bar chart in (e) ii), state the relationship between types of vegetable filtrate and percentage of Vitamin C.
Berdasarkan carta bar di (e) ii), nyatakan hubungan di antara jenis hasil turasan sayur dan peratusan Vitamin C.

_____
_____
_____

(g) State the operational definition for the percentage of Vitamin C.
Nyatakan definisi secara operasi untuk peratusan Vitamin C.

_____
_____
_____

(h) The experiment is repeated with Cauliflower filtrate which has been boiled. Predict the outcome of this experiment.
Explain your answer.
Eksperimen ini diulang dengan menggunakan hasil turasan Cauliflower yang telah dididihkan. Ramalkan hasil eksperimen ini.
Terangkan jawapan anda.

_____
_____
_____
_____
_____

(i) Using the list below, classify the material and apparatus needed in this experiment.
Menggunakan senarai di bawah, kelaskan bahan dan radas yang diperlukan dalam eksperimen ini.

Ascorbic Acid	Fruit Juices	Syringe with needle
Specimen Tube	Measuring Cylinder	DCPIP Solution

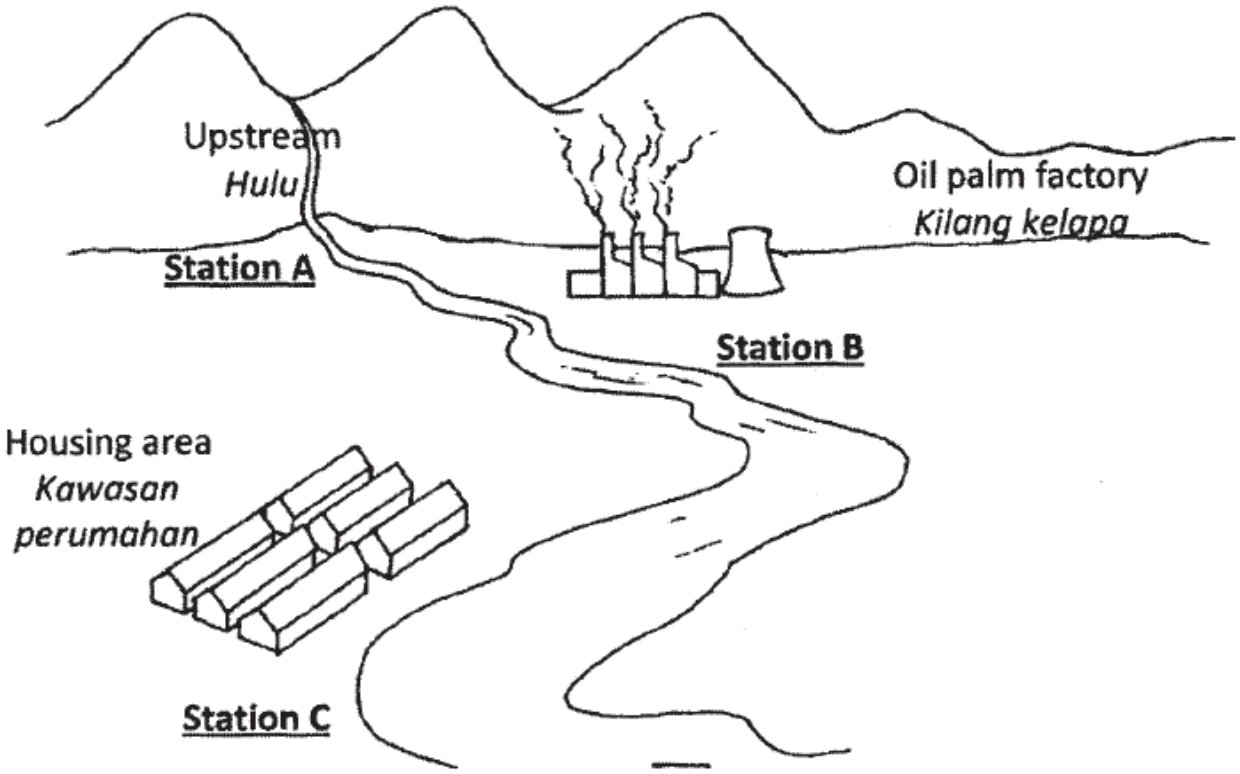
Materials *Bahan*	Apparatus *Radas*

Question 2
Soalan 2

Diagram 2 is an illustration of Hulu Selangor, Selangor area where there is a palm oil farm near Gunung Nuang as well as few lots of bungalow 5 km down a stream which is known as Sungai Congkak. As shown in the diagram below, Sungai Congkak is a river that flows from up the stream towards the factory and bungalow lots.

August, 24 - Statistics from Jabatan P dan Saliran, Selangor shows there were few reports from people leaving in the bungalow lots saying that the Sungai Congkak is badly polluted due to pollutants released from the palm oil factory. They believe that the disposable sewage enhance the growth of microorganism. Due to this contamination, the reports also mentioned about children who were swimming in the river were diagnosed with severe rashes.

Rajah 2 merupakan illustrasi kawasan Hulu Selangor, Selangor di mana terdapat lading kelapa sawit berdekatan dengan Gunung Nuang serta beberapa lot banglo 5km menuruni susur sebuah sungai yang dikenali sebagai Sungai Congkak. Seperti yang ditunjukkan di dalam rajah di bawah, Sungai Congkak merupakan sungai yang mengalir dari atas menuju ke kilang dan lot banglo.



As the representative of Jabatan Alam Sekitar, you are required to design a laboratory experiment to study the degree of water pollution at three different stations along the river.
Sebagai wakil Jabatan Alam Sekitar, anda dikehendaki untuk merancang sebuah eksperimen makmal untuk mengetahui tahap pencemaran air di tiga stesen yang berbeza sepanjang sungai tersebut.

Planning of your experiment must include following aspects:-
Perancangan eksperimen anda hendaklah mengandungi aspek-aspek tersebut berikut:-

- Problem statement/ *Penyataan masalah*
- Hypothesis/ *Hipotesis*
- Variables/ *Pembolehubah*
- Materials and apparatus/ *Bahan dan Radas*
- Procedures/ *Prosedur*
- Presentation of data/ *Persembahan data*

[17 marks]

END OF QUESTION PAPER

KERTAS SOALAN TAMAT