

Penyelesaian Lengkap

Pentaksiran Sumatif

Kertas 1

1 A

Angka yang kelima bagi 24.0637 ialah 3. 3 adalah kurang daripada 5. Jadi, kita tidak perlu menambah satu kepada digit yang sebelumnya, iaitu, 24.06.
The fifth figure of 24.0637 is 3. 3 is less than 5. So, we no need to add one to the previous digit, that is, 24.06.

2 A

$$f(x) = -(x-1)(x-5) \\ = -x^2 + 6x - 5$$

3 A

$$y^2 + 2y = 15 \\ y^2 + 2y - 15 = 0 \\ (y+5)(y-3) = 0 \\ y = -5 \text{ atau/or } y = 3$$

4 B

$$0.712 \times 10^{-3} \text{ m} \\ = 0.712 \times 10^{-1} \text{ cm} \\ = 7.12 \times 10^{-2} \text{ cm}$$

Satu nombor adalah dalam bentuk piawai apabila nombor tersebut dalam bentuk $a \times 10^b$ dengan keadaan $1.0 \leq a < 10.0$ dan b ialah integer.

A number is said to be in standard form when the number is in the form of $a \times 10^b$ where $1.0 \leq a < 10.0$ and b is an integer.

5 A

$$\frac{w^2 - 5w + 6}{2w - 4} \div (w - 3) \\ = \frac{(w-2)(w-3)}{2(w-2)(w-3)} \\ = 0.5$$

6 C

$$\sqrt[3]{p^2} = \frac{3p}{2\sqrt[3]{qr}} \\ p^{\frac{2}{3}} = \frac{3p}{2\sqrt[3]{qr}} \\ p^{\frac{2}{3}-1} = \frac{3}{2\sqrt[3]{qr}} \\ p^{-\frac{1}{3}} = \frac{3}{2\sqrt[3]{qr}} \\ p = \left(\frac{3}{2\sqrt[3]{qr}} \right)^{-3} \\ p = \frac{8qr}{27}$$

7 C

Hanya fungsi pada C boleh mendapat $g(3) = -10$.
Only the function in C can get $g(3) = -10$.

8 B

Nilai yang mungkin bagi p ialah 1 atau 2 sahaja kerana graf $f(x)$ mempunyai lengkok yang lebih lebar. $q = 4$ kerana $f(x)$ dan $g(x)$ mempunyai pintasan- y yang sama, iaitu, 4. Maka, $1 \times 4 = 4$ atau $2 \times 4 = 8$.

The possible values of p are 1 or 2 as graph $f(x)$ has a wider curve. $q = 4$ because $f(x)$ and $g(x)$ have the same y -intercept, that is 4. Hence, $1 \times 4 = 4$ or $2 \times 4 = 8$.

9 D

$$f(x) = -x^2 + 6x + h \\ \text{Pintasan-}y \text{ ialah } 10. \text{ Maka, } h = 10. \\ y\text{-intercept is } 10. \text{ Hence, } h = 10 \\ f(x) = -x^2 + 6x + 10 \\ f(3) = -3^2 + 6(3) + 10 \\ = 19$$

10 B

11 D

Digit bagi suatu nombor dalam asas n terdiri daripada digit-digit kurang daripada n sahaja.
Digits of a number in base n consists of digits which are less than n only.

12 A

$$123_4 = 1(4^2) + 2(4^1) + 3(4^0) \\ = 27_{10} \\ 27_{10} = 3(8^1) + 3(8^0) \\ \text{Maka/Hence, } n = 33$$

13 B

51 boleh dibahagi tepat dengan 3. Maka, 51 bukan nombor perdana.
51 is divisible by 3. Thus, 51 is not a prime number.

14 A

15 C

16 B

17 D

$$n(P \cup R)' = n(Q). \\ 4x = 12 + 2x \\ 2x = 12 \\ x = 6 \\ n(\xi) = 5x + 7 + 6 + 1 + 5 \\ = 30 + 19 \\ = 49$$

18 B

19 D

$$1 \text{ bahagian/part} = 35 \div 7 \\ = 5$$

$$\text{Bilangan kanak-kanak/Number of children} = 4 \times 5 \\ = 20$$

20 D

Bilangan murid yang menggemari Milo sahaja dan kopi sahaja masing-masing ialah 7 dan 1. Maka, bilangan murid yang menggemari Milo sahaja sepatutnya 7 kali bilangan murid yang menggemari kopi sahaja.

The number of students who love Milo only and coffee only is 7 and 1 respectively. Hence, the number of students who love Milo only should be 7 times that of the number of students who love coffee only.

21 B

Graf mudah ialah graf tanpa gelung dan berbilang tepi. *Simple graph is a graph without loops and multiple edges.*

22 D

I:

(1, 2)

$$x + 3y < 10$$

$$1 + 3(2) = 7 < 10$$

II:

$$3x + y > 4$$

$$3(1) + 2 = 5 (>4)$$

III

$$x + y = 3$$

$$1 + 2 = 3$$

23 D

Graf tersebut tidak dapat dilukis sebab jumlah bilangan darjah ialah nombor ganjil.

The graph cannot be drawn because the total degree of vertices is an odd number.

24 D

Suatu pokok mempunyai n bucu dan $n - 1$ tepi.

Graf yang diberi mempunyai 6 bucu. Graf tersebut harus mempunyai 5 tepi untuk menjadi suatu pokok. Sekarang ia mempunyai 13 tepi. $13 - 5 = 8$ tepi harus digugurkan.

A tree has n vertices and $n - 1$ edges. The graph given has 6 vertices. In order for the graph to be a tree, it should have 5 edges. Now it has 13 edges. $13 - 5 = 8$ edges should be removed.

25 B

$$A \rightarrow B \rightarrow C \rightarrow D$$

$$200 \text{ m} + 800 \text{ m} + 80 \text{ m} = 1 \text{ 080 m}$$

26 D

27 D

$$\sum x^2 = 7^2 + 4^2 + 2^2 + 10^2 + 11^2$$

$$= 290$$

$$\sum x = 7 + 4 + 2 + 10 + 11$$

$$= 34$$

$$\text{Min/Mean} = \frac{34}{5}$$
$$= 6.8$$

$$\text{Varians/Variance} = \frac{290}{5} - (6.8)^2$$
$$= 11.76$$

Apabila setiap cerapan dalam suatu set data didarab dengan suatu pemalar j , maka

$$\text{Varians baharu} = j^2 \times \text{varians asal} = 11.76j^2$$

When every data in a set of data is multiplied with a constant j , hence

$$\text{New variance} = j^2 \times \text{original variance} = 11.76j^2$$

28 A

29 A

30 D

31 B

$$\text{Laju purata} = \frac{\text{Jumlah jarak}}{\text{Jumlah masa}}$$
$$= \frac{150 \text{ km}}{1.5 \text{ j}}$$
$$= 100 \text{ km j}^{-1}$$

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$
$$= \frac{150 \text{ km}}{1.5 \text{ h}}$$
$$= 100 \text{ km h}^{-1}$$

32 B

$$\text{Julat/Range} = 20 - 7$$
$$= 13$$

Julat antara kuartil adalah ukuran serakan yang lebih sesuai untuk set data di atas sebab wujudnya pencilan. *Interquartile range is a more suitable measure of dispersion for the set of data above because there is an outlier.*

7 8 8 9 9 9 10 10 10 11 11 11 11 12 12
12 13 13 13 13 14 14 14 14 14 15 15 15
16 20

$$\text{Median} = 12$$

33 A

$$(5m, 60) (3m, 80)$$

$$\frac{80 - 60}{3m - 5m} = -2.5$$

$$\frac{20}{-2m} = -2.5$$

$$5m = 20$$

$$m = 4$$

34 A

Jarak yang dilalui a jam yang pertama

Distance travelled in the first a hours

$$= 0.5(a)(40)$$

$$= 20a$$

Jarak yang dilalui selepas a jam

Distance travelled after a hours

$$= 40a$$

35 A

Bilangan murid Number of students	Kekerapan Frequency	Kekerapan longgokan Cumulative frequency
0	0	0
1	3	3
2	6	9
3	9	18
4	10	28
5	12	40

$$Q_1 = \text{cerapan ke-} \left(\frac{1}{4} \times 40 \right)$$

$$= \text{cerapan ke-} 10$$

$$= 3$$

$$Q_1 = \text{the} \left(\frac{1}{4} \times 40 \right) \text{th value}$$

$$= \text{the 10th value}$$

$$= 3$$

$$Q_3 = \text{cerapan ke-} \left(\frac{3}{4} \times 40 \right)$$

$$= \text{cerapan ke-} 30$$

$$= 5$$

$$Q_4 = \text{the} \left(\frac{3}{4} \times 40 \right) \text{th value}$$

$$= \text{the 30th value}$$

$$= 5$$

Julat antara kuartil/Interquartile range

$$= 5 - 3$$

$$= 2$$

36 B

$$\text{Min/Mean} = \frac{\sum x}{n}$$

$$10 = \frac{\sum x}{25}$$

$$\sum x = 250$$

$$\text{Varians/Variance} = \frac{\sum x^2}{25} - 10^2$$

$$\frac{\sum x^2}{25} - 10^2 = 2$$

$$\sum x^2 = 2550$$

$$\sum x \text{ baharu/New } \sum x = 250 - 40$$

$$= 210$$

Katakan m ialah bilangan nombor yang dikeluarkan.
Let m be the number of numbers being removed.

$$\frac{40}{m} = 10$$

$$m = 4$$

Katakan r ialah hasil tambah kuasa dua nombor-nombor yang dikeluarkan.

Let r be the sum of the squares of the numbers being removed.

Sisihan piawai baharu/New standard deviation = $\sqrt{20}$

$$\sqrt{\frac{2550 - r}{25 - 4} - \left(\frac{210}{25 - 4} \right)^2} = \sqrt{20}$$

$$\frac{2550 - r}{21} - 100 = 20$$

$$2550 - r = 2520$$

$$r = 30$$

37 C

$1 - P(\text{Tiada ros dua kali berturut-turut/No rose for two times consecutively}) = 0.36$

$P(\text{Tiada ros dua kali berturut-turut/No rose for two times consecutively}) = 0.64$

$$P(\text{Tiada ros/No rose}) = \sqrt{0.64}$$

$$= 0.8$$

$$P(\text{Ros/Rose}) = 1 - 0.8$$

$$= 0.2$$

$$P(\text{Bunga raya/Hibiscus}) = 1 - 0.2 - 0.3$$

$$= 0.5$$

$$1 - P(\text{Tiada bunga raya/No hibiscus})$$

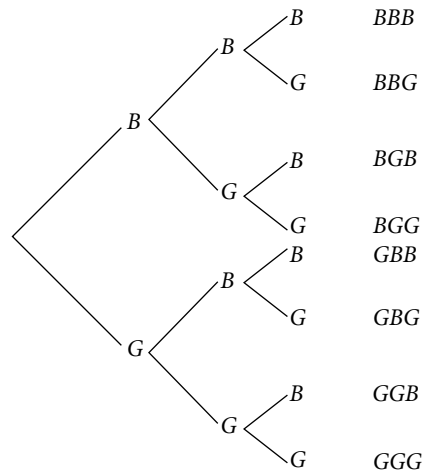
$$= 1 - 0.5(0.5)$$

$$= 0.75$$

Sekurang-kurangnya $0.75 \times 284 = 213$ bunga raya akan dipilih.

At least $0.75 \times 284 = 213$ hibiscus will be picked.

38 D



39 D

40 A

Jumlah pendapatan – Perbelanjaan tetap – Perbelanjaan tidak tetap

$$\text{Total income} - \text{Fixed expenses} - \text{Variable expenses}$$

$$= \text{RM6 000} - \text{RM4 000} - \text{RM1 500}$$

$$= \text{RM500}$$

Encik Yusri perlu menyimpan $\text{RM3 600} \div 12 = \text{RM300}$ sebulan untuk mencapai matlamat kewangannya satu tahun kemudian.

Encik Yusri need to save $\text{RM3 600} \div 12 = \text{RM300}$ a month in order to achieve his financial goal one year later.

$$\text{Aliran Tunai Encik Yusri/Encik Yusri's cash flow}$$

$$= \text{RM500} - \text{RM300}$$

$$= \text{RM200}$$

Kertas 2

Bahagian/Section A

1 (a) $x = 2$

(b) $g(x) = -(x + 1)(x - 5)$

$$= -x^2 + 4x + 5$$

(c) $c = 5$

2 $64_8 = 6(8^1) + 4(8^0)$

$$= 52$$

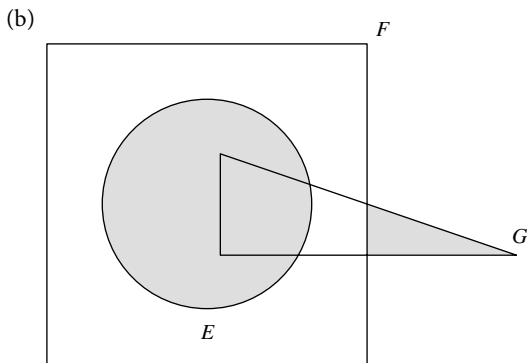
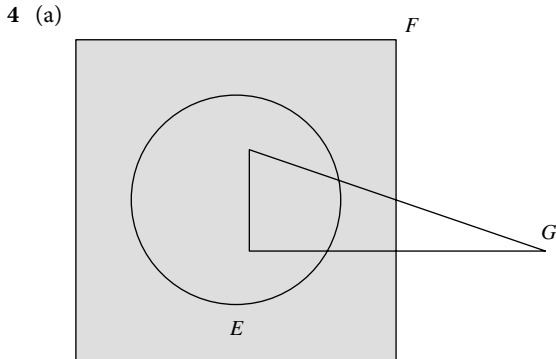
$$110000_2 = 2^5 + 2^4$$

$$= 48$$

Kedai Q memuaskan keperluan James.

Shop Q satisfies James's requirement.

- 3 (a) Jika $b \leq -4$, maka $-b \geq 4$.
 If $b \leq -4$, then $-b \geq 4$.
 (b) $5(n) - 3(n+2)^2$, dengan/where $n = 0, 1, 2, \dots$



- 5 (a) $d(W) = d_{in}(W) + d_{out}(W)$
 $= 1 + 3$
 $= 4$
 (b) $V = \{W, X, Y, Z\}$
 (c) $E = \{(W, W), (W, X), (W, Y), (X, X), (X, Z), (Z, Y), (Y, Z)\}$
 (d) $n(E) = 7$
 Bilangan darjah/Sum of degrees $= 7 \times 2 = 14$

- 6 Jumlah luas/Sum of area $= 20$
 $0.5 \times (\text{Tapak/Base}) \times 4 = 20$
 Tapak/Base $= 10$

$(-5, 0) (0, 4)$
 Garis/Line AB
 $y = \frac{4-0}{0-(-5)}x + 4$

$y = \frac{4}{5}x + 4$

Garis/Line BC

$y = -\frac{4}{5}x + 4$

$y \geq 0, \quad y < -\frac{4x}{5} + 4 \quad y \leq -\frac{4x}{5} + 4$

- 7 $0.5(v + v + 8)(3\ 600) + 0.5(v)(3\ 600) = 46\ 800$
 $3\ 600v + 14\ 400 + 1\ 800v = 46\ 800$
 $5\ 400v = 32\ 400$
 $v = 6$

8 Tingkatan 4/Form 4

Min/Mean, $\bar{x} = \frac{\sum x}{\sum f}$

$58 = \frac{\sum x}{480}$
 $\sum x = 27\ 840$

Varians/Variance $= \frac{\sum x^2}{\sum f} - \bar{x}^2$

$4 = \frac{\sum x^2}{480} - 58^2$

$\sum x^2 = (4 + 58^2)480$
 $= 1\ 616\ 640$

Tingkatan 5/Form 5

Min/Mean, $\bar{x} = \frac{\sum x}{\sum f}$

$65 = \frac{\sum x}{468}$
 $\sum x = 30\ 420$

Varians/Variance $= \frac{\sum x^2}{\sum f} - \bar{x}^2$

$3 = \frac{\sum x^2}{468} - 65^2$

$\sum x^2 = (3 + 65^2)468$
 $= 1\ 978\ 704$

Gabungan kumpulan/Combined group

Sisihan piawai/Standard deviation

$= \sqrt{\frac{1\ 616\ 640 + 1\ 978\ 704}{480 + 468} - \left(\frac{27\ 840 + 30\ 420}{480 + 468}\right)^2}$

$= \sqrt{\frac{3\ 595\ 344}{948} - \left(\frac{58\ 260}{948}\right)^2}$

$= 3.969$

9

	Ungu Purple	Biru Blue
Lelaki/Boys	8	12
Perempuan/Girls	16	6

Kebarangkalian/Probability $= 1 - \frac{12}{20} \times \frac{11}{19}$
 $= 0.6526$

10 (a) Pinjaman rumah/House loan

(b) Katakan x ialah gaji untuk kerja sampingan Kelly

Let x be Kelly's salary for the part time job

Aliran tunai = Jumlah pendapatan - Jumlah perbelanjaan

Cash flow = Total income - Total expenses

$1\ 500 = 4\ 500 + x - (1\ 500 + 500 + 2\ 000 + 300)$

$x = 1\ 300$

Bahagian/Section B

- 11 (a) (i) $(8, 0)$

(ii) $f(x) = -ax^2 + bx$

Pada/At $(4, 6)$

$6 = -a(4)^2 + 4b \dots\dots \textcircled{1}$

Pada/At $(8, 0)$

$0 = -a(8)^2 + 8b$

$64a = 8b$

$b = 8a \dots\dots \textcircled{2}$

$$\textcircled{2} \rightarrow \textcircled{1}$$

$$16a - 4(8a) = -6$$

$$16a = 6$$

$$a = \frac{3}{8}$$

$$b = 8\left(\frac{3}{8}\right)$$

$$b = 3$$

$$\text{Maka/Thus } f(x) = -\frac{3}{8}x^2 + 3x$$

$$(b) (i) g(x) = \frac{3}{8}x^2 + 3x$$

$$(ii) g(x) = -\frac{3}{8}x^2 - 3x$$

- (c) Hujah tersebut adalah sah tetapi tidak munasabah kerana walaupun memenuhi Bentuk III, tetapi Premis 1 adalah palsu.

The argument is valid but not sound because although it fulfils Form III, but Premise 1 is false.

$$12 \quad 35 + 9x = 62$$

$$9x = 27$$

$$x = 3$$

- (a) (i) Bilangan murid yang menggemari sekurang-kurangnya dua jenis sukan
The number of pupils who like at least two types of sports.

$$= 11 + 8 + 3(3) + 2$$

$$= 30$$

- (ii) Bilangan murid yang menggemari bola sepak
The number of pupils who like football

$$= 11 + 2 + 8(3)$$

$$= 37$$

$$(b) 1011_2 = 2^3 + 2^1 + 2^0$$

$$= 8 + 2 + 1$$

$$= 11$$

Jumlah murid menjadi $62 + 11 = 73$. Maka, kebarangkalian murid yang terpilih menggemari

hoki sahaja ialah $\frac{3}{73}$

The total number of pupils become $62 + 11 = 73$.

Thus, the probability of the pupil chosen that like

hockey only is $\frac{3}{73}$

$$13 (a) (i) y = -2x + 16$$

Apabila/When $x = 4$

$$y = -2(4) + 16$$

$$y = 8$$

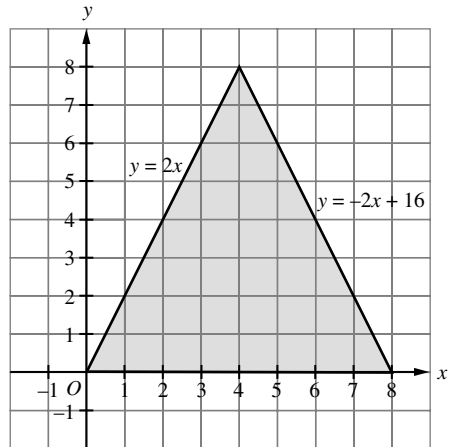
$$(4, 8)$$

Apabila/When $x = 8$

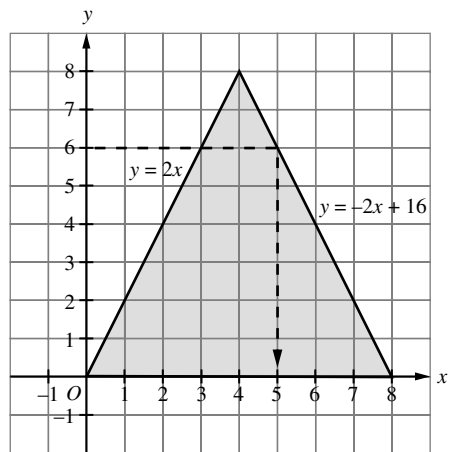
$$y = -2(8) + 16$$

$$y = 0$$

$$(8, 0)$$



(ii)



$$x = 5$$

- (b) (i) Katakan x dan y masing-masing mewakili harga bagi kasut dan seluar.

Let x and y be the price for shoes and pants respectively.

$$2x + 3y = 383 \dots\dots \textcircled{1}$$

$$4x + y = 321 \dots\dots \textcircled{2}$$

- (ii) $\textcircled{1} \times 2$:

$$4x + 6y = 766 \dots\dots \textcircled{3}$$

$$\textcircled{3} - \textcircled{2}:$$

$$5y = 445$$

$$y = 89$$

$$2x + 3(89) = 383$$

$$2x = 116$$

$$x = 58$$

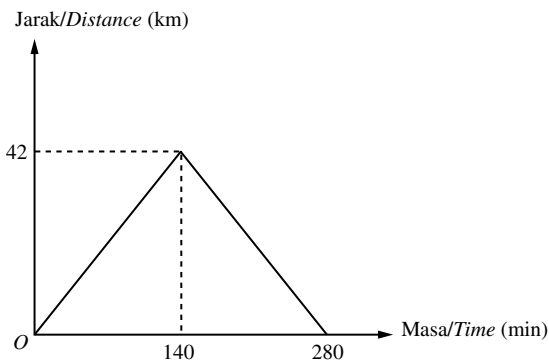
Jumlah bayaran Thiva/Total payment of Thiva

$$= 3(58) + 2(89)$$

$$= 352$$

- 14 (a) (i) $4 \times 3 \times 2 \times 1 = 24$ laluan/routes
(ii) Graf yang diberi bukan suatu pokok kerana terdapat 5 bucu dan 10 tepi. Pokok seharusnya mempunyai n bucu dan $n - 1$ tepi.
The graph given is not a tree because there are 5 vertices and 10 edges. A tree should have n vertices and $n - 1$ edges.

- (b) $A \rightarrow B \rightarrow C \rightarrow D \rightarrow C \rightarrow B \rightarrow A$
Jumlah masa yang diambil = 280 minit
Total time taken = 280 minutes
Laju purata = 18 km h^{-1}
Average speed = 18 km h^{-1}
 $\frac{\text{Jumlah jarak/Total distance}}{280 \div 60} = 18$
Jumlah jarak/Total distance = 84 km



- 15 (a) (i)

Ketinggian tumbuh-tumbuhan di taman Puan Kamisah/ <i>Height of plants in Puan Kamisah's garden</i>	Ketinggian tumbuh-tumbuhan di taman Puan Shifa/ <i>Height of plants in Puan Shifa's garden</i>
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8 3	5	5 8
7 4 4 2	6	1 5 7 9
8 5 3	7	3 9
8 5 2 0	8	0 2 3 3 8 9
5 2 0 0	9	0 1 4

Kekunci: 5|5 bermaksud 55 cm
Key: 5|5 means 55 cm

- (ii) Taman Puan Kamisah/*Puan Kamisah's garden*
Julat/Range
= $95 - 53$
= 42

Taman Puan Shifa/*Puan Shifa's garden*
Julat/Range
= $94 - 55$
= 39

Taman Puan Kamisah mempunyai serakan data yang lebih besar.
Puan Kamisah's garden has a greater dispersion.

- (b) 150 180 200 200 210 220 250 250
260 270 280 280 300 320 320
(i) Median = 250
(ii) Julat antara kuartil/*Interquartile range*
= $280 - 200 = 80$

Bahagian/Section C

- 16 (a) Isi padu prisma + Isi padu trapezoid + Isi padu segi empat tepat
Volume of prism + Volume of trapezoid + Volume of rectangle
= $(0.5 \times 8 \times 3 \times 6) + [0.5 \times (8 + 12) \times 5 \times 16] + (7 \times 16 \times 12)$
= $72 + 800 + 1\,344$
= 2 216

7	2216	Baki/Remainder
7	316	4
7	45	1
7	6	3
	0	6

Isi padu gabungan bongkah ialah 6314_7 cm^3 .
The volume of the combined blocks is 6314_7 cm^3 .

- (b) (i) Matlamat kewangan jangka pendek
Short term financial goal
(ii) Perbelanjaan makanan/*Food expenses*;
Bayaran utiliti/*Utility payments*
(iii) Aliran tunai/*Cash flow*
= $\text{RM}2\,500 - (\text{RM}150 + \text{RM}300 + \text{RM}900 + \text{RM}160) - \text{RM}18\,000 \left(\frac{0.2}{12} \right) = \text{RM}690$
(iv) Taufik menggunakan konsep SMART semasa mencapai matlamat kewangannya.
Taufik uses SMART concept to achieve his financial goal.
Khusus – Membeli sebuah van terpakai yang berharga RM18 000.
Specific – Buy a second-hand van worth RM18 000.
Boleh diukur – Membayar wang pendahuluan sebanyak $20\% \times 18\,000 = \text{RM}3\,600$.
Measurable – Pay downpayment of $20\% \times 18\,000 = \text{RM}3\,600$.
Boleh dicapai – Wang pendahuluan yang boleh dicapai sebanyak RM3 600 dalam setahun
Attainable – Save RM3 600 for downpayment within a year.
Realistik – Simpanan bulanan sebanyak $\frac{\text{RM}3\,600}{12} = \text{RM}300$ daripada jumlah pendapatannya iaitu RM2 500 adalah sebanyak $\frac{\text{RM}300}{\text{RM}2\,500} \times 100\% = 12\%$ sahaja.

Realistic – Monthly savings of
 $\frac{\text{RM3 600}}{12} = \text{RM300}$ from
 his total income of RM2 500
 is $\frac{\text{RM300}}{\text{RM2 500}} \times 100\% = 12\%$
 only.

Tempoh masa – Dalam tempoh 1 tahun
 Time bound – Within 1 year

17 (a) Faedah Program 1/Programme 1 interest

$$I = Prt$$

$$= \text{RM60 000} \times 7\% \times 5$$

$$= \text{RM21 000}$$

Program 2/Programme 2

$$MV = P\left(1 + \frac{r}{n}\right)^{nt}$$

$$= \text{RM60 000}\left(1 + \frac{0.05}{6}\right)^{6(5)}$$

$$= \text{RM76 961.76}$$

Faedah Program 2/Programme 2 interest

$$= \text{RM76 961.76} - \text{RM60 000}$$

$$= \text{RM16 961.76}$$

Program 1 adalah lebih produktif.

Programme 1 is more productive.

(b) (i)

Bulan/Month	Harga seunit/ Price per unit (RM)	Bilangan unit/ Number of unit
Januari/January	0.27	1 851.85
Februari/February	0.30	1 666.67
Mac/March	0.26	1 923.08
April	0.24	2 083.33
Mei/May	0.25	2 000.00
Jun/June	0.23	2 173.91

(ii) Jumlah pelaburan/Total investment

$$= \text{RM500} \times 6$$

$$= \text{RM3 000}$$

Jumlah bilangan unit/Total number of units

$$= 1 851.85 + 1 666.67 + 1 923.08 + 2 083.33$$

$$+ 2 000 + 2 173.91$$

$$= 11 698.84$$

Harga purata seunit/Average price per unit

$$= \frac{\text{RM3 000}}{11 698.84}$$

$$= \text{RM0.2564}$$

$$0.28 \times 11 698.84 - 0.2564 \times 11 698.84$$

$$= \text{RM276.09}$$

Daniel mendapat keuntungan sebanyak
 RM276.09.

Daniel made a profit of RM276.09.