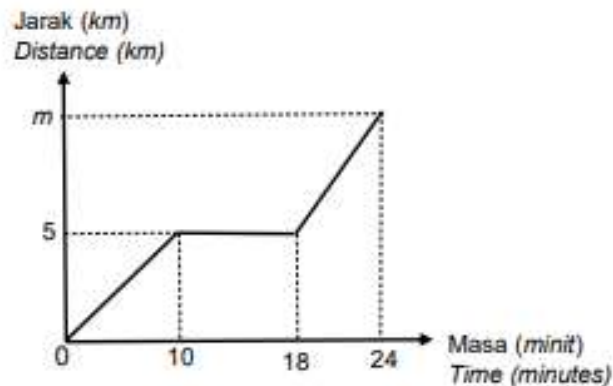


GRAF GERAKAN / GRAPHS OF MOTION

MELAKA

- (b) Setiap pagi, Adli akan memandu kereta ke Pasar Tani tempat dia berniaga nasi lemak. Graf jarak-masa dalam Rajah 11 menunjukkan pergerakan kereta Adli dari rumah ke Pasar Tani. Adli akan singgah sebentar di Taska Anakku untuk menghantar anaknya, sebelum meneruskan perjalanannya.

Every morning, Adli will drive his car to Pasar Tani, the place where he trades nasi lemak. The distance-time graph in Diagram 11 shows the motion of his car from his house to Pasar Tani. Adli will stop a while at Taska Anakku to send his child before continuing his journey.



Rajah 11 / Diagram 11

Jawapan / Answer :

(b) (i)

(ii)

- (i) Nyatakan tempoh masa, dalam minit, Adli berhenti di Taska Anakku.

State the duration of time, in minutes, Adli stopped at Taska Anakku.

[1 markah / marks]

- (ii) Hitung laju, dalam km h^{-1} , kereta Adli dari rumah ke Taska Anakku.

Calculate the speed, in km h^{-1} , of Adli's car from his house to Taska Anakku.

[2 markah / marks]

- (iii) Hitung nilai m , jika diberi laju purata keseluruhan perjalanan ialah 45 km h^{-1} .

Calculate the value of m , if given that average speed for the whole journey is 45 km h^{-1} .

[2 markah / marks]

(iii)

SMKA / SABK

- (b) Natasya memandu keretanya sejauh 60 km dari rumahnya untuk melawat rakannya di hospital. Jadual 4.2 menunjukkan catatan perjalanannya.

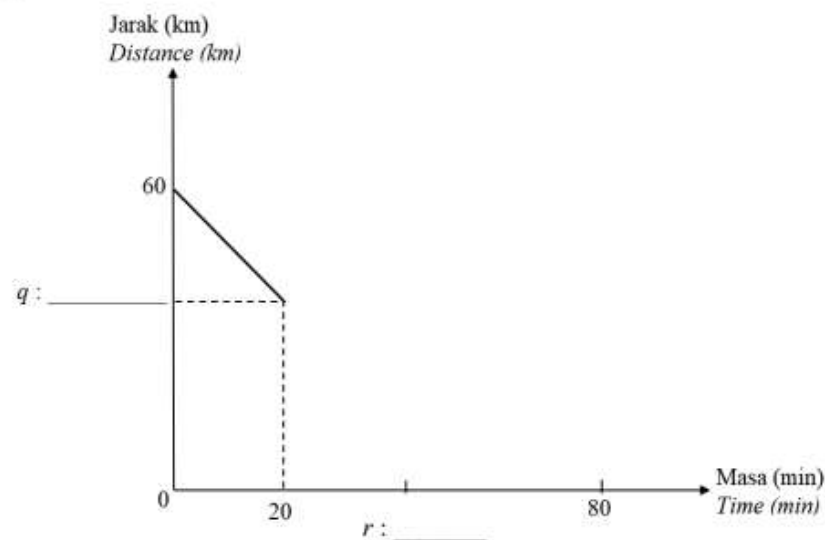
Natasya drives her car for 60 km from her house to visit her friend in hospital.

Table 4.2 shows the note of her journey.

Masa Time	26 Disember 2020 26 December 2020
8.00 a.m.	Memulakan perjalanan dari rumahnya. <i>Start journey from her house.</i>
8.20 a.m.	Berhenti di sebuah restoran untuk bersarapan setelah memandu sejauh 25 km. <i>Stop at a restaurant to have breakfast after driving for 25 km.</i>
8.40 a.m.	Meneruskan perjalanan untuk 35 km lagi. <i>Continue journey for another 35 km.</i>
9.20 a.m.	Tiba di hospital. <i>Arrive at the hospital.</i>

Jadual 4.2
Table 4.2

b) (i) (a), (b)



Rajah 8
Diagram 8

- (i) Rajah 8 di ruang jawapan menunjukkan graf jarak-masa.
Diagram 8 in the answer space shows a distance-time graph.

(a) Nyatakan nilai q dan nilai r .
State the values of q and r .

(b) Lengkapkan graf untuk menggambarkan keseluruhan perjalanan Natasya.
Complete the graph to represent Natasya's whole journey.

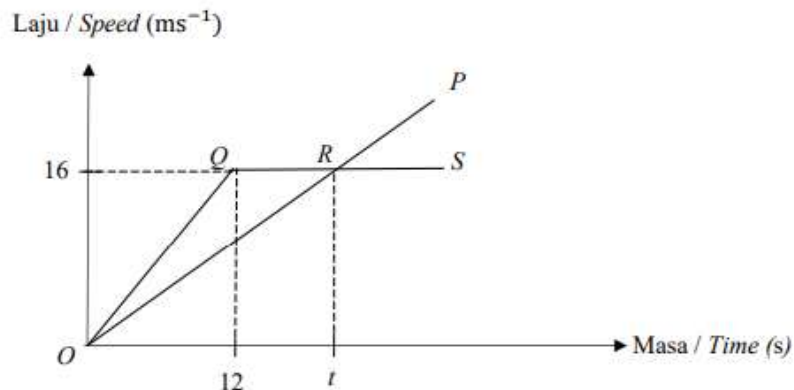
- (ii) Hitung laju purata keseluruhan perjalanan itu, dalam kmh^{-1} .
Calculate the average speed for the whole journey, in kmh^{-1} .

[6 markah]
[6 marks]

JOHOR SET 3

Dalam rajah 3 di bawah, graf OP mewakili Gerakan zarah H manakala graf $OQRS$ mewakili zarah K dalam tempoh t saat.

In the diagram 3 below, the graph OP represents the motion of particle H while the graph $OQRS$ represents the motion of particle K for a period of t seconds.



Rajah 3 / Diagram 3

- (a) Nyatakan laju seragam, dalam ms^{-1} , bagi zarah K .

State the uniform speed, in ms^{-1} , of the particle K .

- (b) Pada t saat, beza antara jarak yang dilalui oleh zarah H dan zarah K ialah 24 m. Hitung nilai t .

In t seconds, the difference in distance travelled between particle H and K is 24 m.

Calculate the value of t .

[4 markah / 4 marks]

Jawapan/Answer:

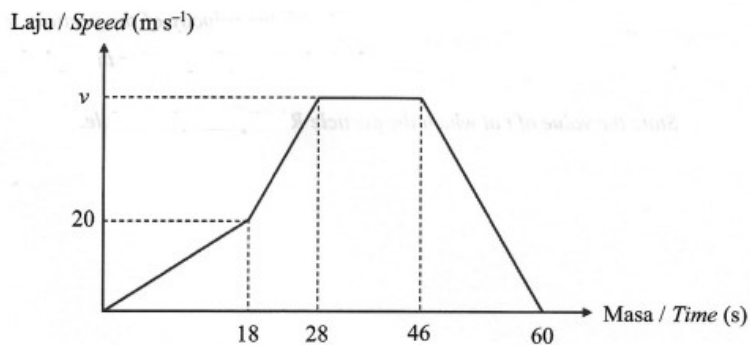
(a)

(b)

KEDAH

- (b) Suatu zarah lain iaitu zarah Q telah dipecutkan di bawah suatu garisan lurus. Laju zarah Q terhadap masa dalam tempoh 60 saat ujian tersebut direkodkan di dalam graf laju-masa seperti dalam Rajah 17(a) di bawah.

Another particle, which is a particle Q was accelerated under a straight line. The speed of the particle Q over time within 60 seconds of the test is recorded in the speed-time graph as in Diagram 17(b) below.



Rajah / Diagram 17(b)

- (i) Hitung kadar perubahan laju, dalam m s^{-2} , bagi zarah Q dalam 18 saat pertama.
Calculate the rate of change, in m s^{-2} , of the particle Q in the first 18 seconds.
- (ii) Hitung nilai v jika jumlah jarak pergerakan zarah Q dalam tempoh 60 saat ialah sama dengan jumlah jarak pergerakan zarah P iaitu 1.72 km

Calculate the value of v if the total distance of the movement of the particle Q in the 60 seconds is the same as the movement of the particle P which is 1.72 km.

- (iii) Huraikan pergerakan zarah Q dalam tempoh 14 saat terakhir ujian tersebut.

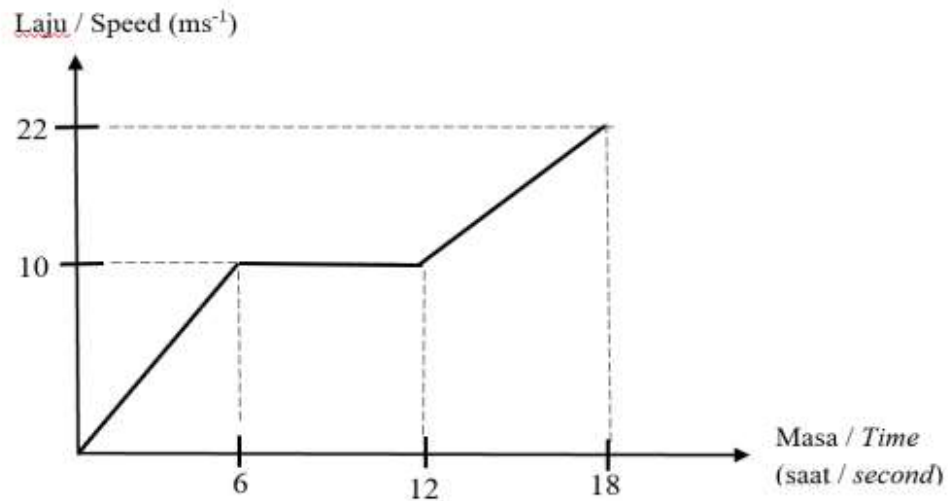
Describe the movement of the particle Q during the last 14 seconds of the test.

[7 markah / marks]

JOHOR SET 3

Graf laju masa dalam Rajah 8 menunjukkan kelajuan sebuah zarah.

The time speed graph in Diagram 8 shows the speed of a particles.



Rajah 8 / Diagram 8

- (a) Hitung laju purata, dalam ms^{-1} , zarah dalam tempoh 18 saat.
Calculate the average speed, in ms^{-1} , of a particles in 18 seconds.

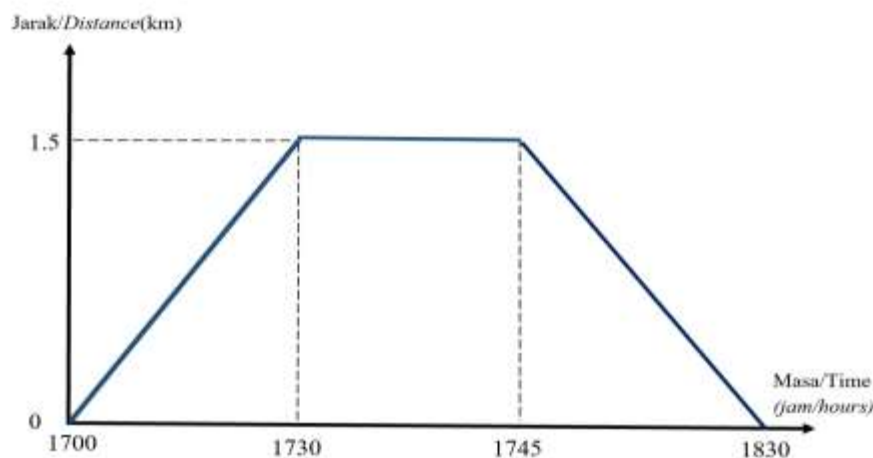
- (b) Huraikan Gerakan zarah bagi tempoh 6 saat yang kedua.
Describe the motion of the particles for the next 6 seconds.

[4 markah / 4 marks]

JOHOR SET 1

- (c) Encik Talib meluangkan masa berjoging pada hujung minggu dengan menggunakan kasut yang baru dibelinya untuk membakar kalori dalam tubuh. Rajah 17 menunjukkan pergerakan Encik Talib berjoging pada hujung minggu. Encik Talib akan berhenti sebentar apabila sampai di kawasan rehat sebelum pulang ke rumahnya semula.

Mr Talib spent time jogging over the weekend using shoes he had just bought to burn calories in the body. Diagram 17 shows Mr Talib jogging over the weekend. Mr Talib will stop for a while when he reaches the rest area before returning home.



Rajah 17/ Diagram 17

Berdasarkan Rajah 17 diatas ,
Based on diagram 17 above ,

- (i) Nyatakan tempoh masa Encik Talib berada dikawasan rehat.
Specify the length of time Mr Talib was in the rest of the area.

[1 markah/1 marks]

- (ii) Berapakah jarak keseluruhan perjalanan Encik Talib dari rumahnya ke kawasan rehat dan kemudian kembali ke rumahnya semula sewaktu berjoging.
What is the total distance Mr Talib's entire journey from his home to the rest area and then returned to his home again during the jog.

[1 markah/1 marks]

- (iii) Seterusnya, hitung laju purata dalam kmj^{-1} keseluruhan perjalanan berjoging Encik Talib.

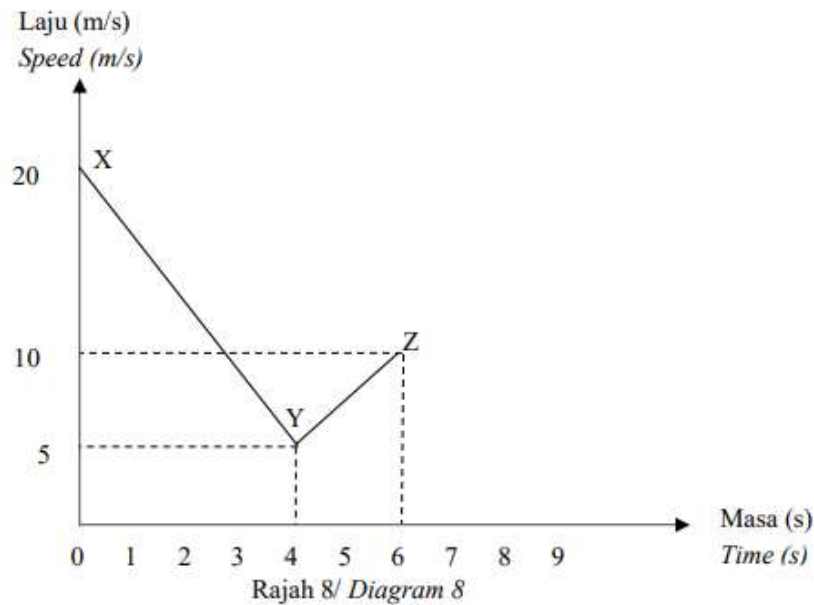
Hence, calculate the average speed in kmj^{-1} , the entire trip jogging Mr. Talib.

[2 markah/2 marks]

JOHOR SET 2

Rajah 8 menunjukkan graf laju-masa bagi sebuah zarah yang bergerak dari stesen X ke Stesen Z.

Diagram 8 shows the speed-time graph for a particle moving from Station X to Station Z.



Jawapan/ Answer :

(a)

(b)

Hitung /calculate

- (a) Laju purata dalam ms^{-1} perjalanan zarah itu dari stesen X ke stesen Z.
The average speed in ms^{-1} of travel of the particle from station X to station Z.
- (b) Perihalkan pergerakan zarah semasa ia bergerak dari stesen Y ke stesen Z.
Describe the movement of a particle as it moves from station Y to station Z.

[4 markah/4 marks]

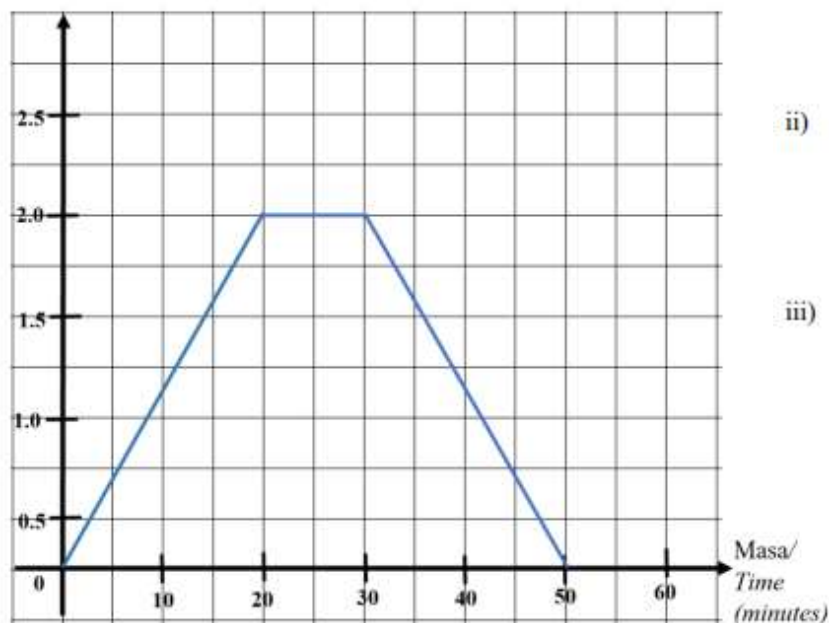
JOHOR SET 2

- c) Encik Harraz menggunakan kasut yang dibelinya untuk membuat latihan larian maraton mewakili jabatannya. Graf jarak -masa dalam rajah 17 menunjukkan jarak dan masa larian Encik Harraz dari rumahnya ke taman permainan dan balik ke rumahnya semula.

Mr. Harraz uses the shoes he bought to practice marathon running representing his department.

The distance -time graph at the diagram 17 shows the distance and time of Mr. Harraz's run from his home to the playground and back to his home again.

Jarak/ Distance(km)



Rajah 17/ Diagram 17

- i) Nyatakan tempoh masa dalam saat Encik Harraz berhenti berehat di taman permainan.
State the duration of time in second Mr. Harraz stop resting at the playground.

[1 markah/1 marks]

- ii) Hitung jarak perjalanan Encik Harraz pergi dan balik
Calculate the distance traveled by Mr. Harraz.

[1 markah/1 marks]

- iii) Hitung laju purata dalam kmj^{-1} keseluruhan larian Encik Harraz.
Calculate the average speed in kmj^{-1} of Mr. Harraz's entire run.

[2 markah/2 marks]

N9

Graf laju-masa menunjukkan gerakan bagi sebuah bot. Selepas berlayar selama 25 minit, bot tersebut mengalami masalah dan nyahpecutan secara seragam dan berhenti bergerak selepas 15 minit. Pada graf yang sama, lukis satu garisan bagi melengkapkan gerakan bot tersebut dan seterusnya hitung jumlah jarak, dalam meter, yang dilalui sehingga bot berhenti.

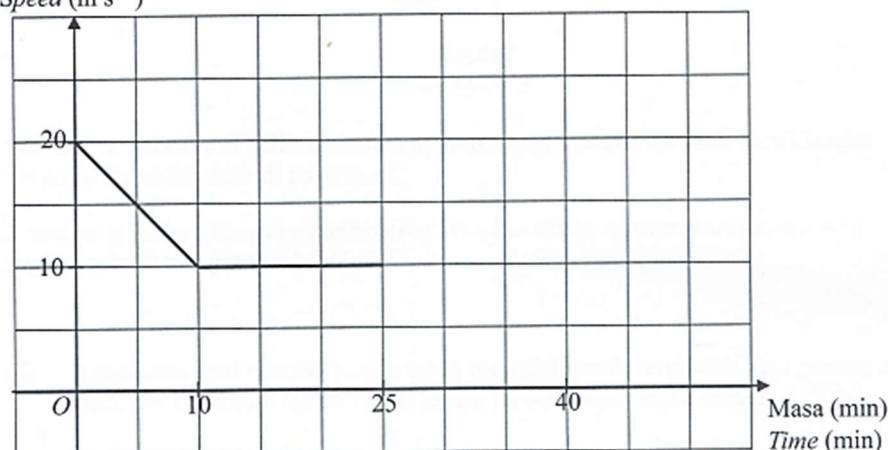
The speed-time graph shows the motion of a boat. After 25 minutes of moving, the boat encountered difficulty and decelerate uniformly and eventually stop moving after 15 minutes. On the same graph, draw a line to complete the motion of the boat and hence calculate the total distance, in metres, travelled by the boat until it stops.

[4 marks]

[4 markah]

Jawapan / Answer :

Laju (m s^{-1})
Speed (m s^{-1})



Rajah 4
Diagram 4

KELANTAN

Jadual 2 menunjukkan laju dan masa bagi satu zarah dalam tempoh 12 saat.

Table 2 shows the speed and time of a particle in 10 seconds.

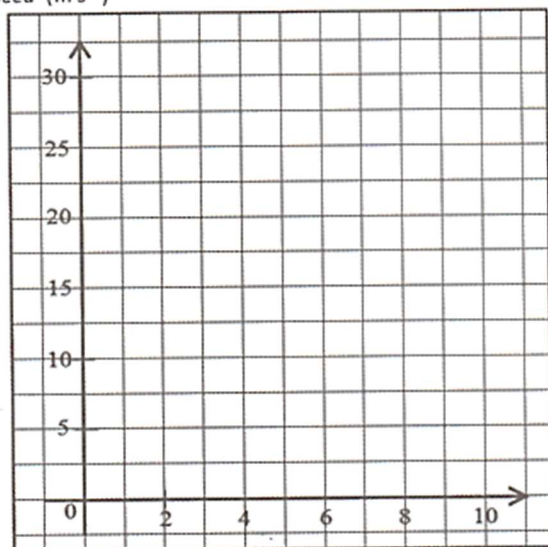
Laju (ms^{-1})	0	15	15	30
Speed (ms^{-1})	0	15	15	30
Masa (s)	0	2	6	10
Time (s)	0	2	6	10

Jadual 2 / Table 2

(a) Berdasarkan Jadual 2, lukis graf laju-masa pada rajah di ruang jawapan.

Based on Table 2, draw the speed-time graph in figure in the answer space.

Speed (ms^{-1})



Masa (s)
Time (s)

[2 markah/marks]

(b) Berdasarkan graf yang dilukis pada rajah di ruang jawapan, nyatakan :

Based on the graph drawn in Figure in the answer space, state :

(i) Laju seragam, dalam ms^{-1} , zarah itu [1 markah/marks]

Uniform speed, in ms^{-1} , of the particle

(ii) Tempoh masa dalam saat, zarah bergerak dalam laju seragam [1 markah/marks]

The duration of time, in second, the particle moves in uniform speed.

(c) hitung kadar perubahan laju dalam ms^{-2} , dalam tempoh 4 saat terakhir.

Calculate the rate of change of speed, in ms^{-2} , for the last 4 second. [2 markah/marks]

(d) Hitung purata laju, dalam ms^{-1} bagi zarah itu dalam 10 saat.

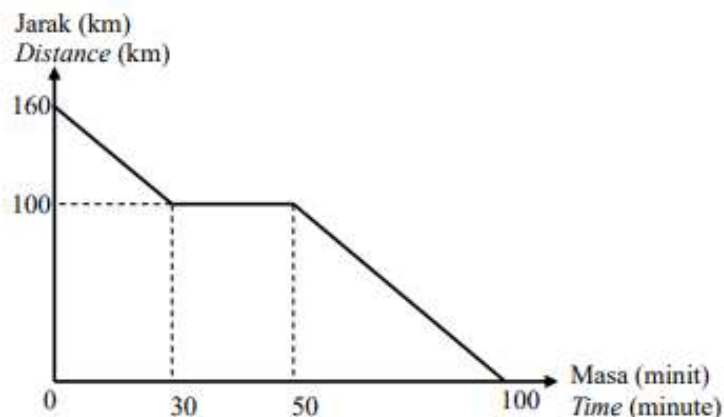
Calculate the average speed, in ms^{-1} , of the particle in period of 10 second

[3 markah/marks]

KUANTAN, PAHANG

Rajah 6 menunjukkan graf jarak-masa bagi perjalanan sebuah kereta dari bandar A ke bandar C melalui bandar B dalam tempoh 100 minit.

Diagram 6 shows the distance-time graph for the journey of a car from town A to town C through town B in 100 minutes.



Jawapan / Answer

(a) (i)

(ii)

(b)

(a) (i) Nyatakan tempoh masa, dalam minit, ketika kereta itu berhenti.
State the duration of time, in minutes, during which the car is stationary.

(c)

(ii) Nyatakan jarak bandar A dari bandar C.
State the distance town A from town C.

(b) Hitung laju purata, dalam kmj^{-1} , bagi keseluruhan perjalanan.
Calculate the average speed, in kmj^{-1} , of the whole journey.

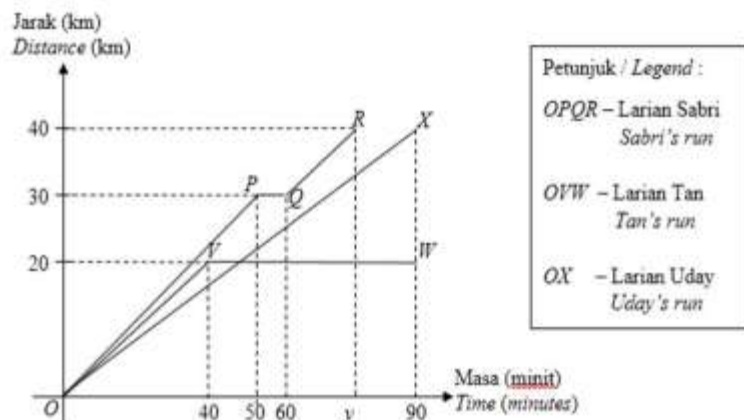
(c) Huraikan perjalanan kereta itu dalam 30 minit pertama.
Describe the motion of the car in the first 30 minutes.

[8 markah / marks]

PEKAN, PAHANG

Rajah 4 menunjukkan graf jarak-masa bagi Sabri, Tan dan Uday dalam acara berbasikal 40 km.

Diagram 4 shows the distance-time graph of Sabri, Tan and Uday in a 40 km race.



Rajah / Diagram 4

- (a) i. Siapakah yang tidak menghabiskan acara larian itu?

Who did not finish the race?

[2 markah/ marks]

- ii. Siapakah yang memenangi acara larian itu?

Who won the race?

[2 markah/ marks]

- (b) Hitung jarak, dalam km, penunggang basikal yang tidak menghabiskan perlumbaan itu dari garisan penamat apabila dia berhenti mengayuh basikal.

Calculate the distance, in km, of the cyclist who did not finish the race from the finishing line when he stopped cycling.

[1 markah/ marks]

- (c) Hitung laju purata, dalam kmj^{-1} , bagi Uday.

Calculate the average speed, in kmh^{-1} , of Uday.

[2 markah/ marks]

- (d) i. Sabri terjatuh semasa perlumbaan. Selepas itu, dia meneruskan perlumbaan sehingga ke garisan penamat. Nyatakan tempoh masa, dalam minit, sebelum Sabri meneruskan perlumbaan.

Sabri fell over during the race. After that, he continued his race till the finishing line. State the duration of time, in minutes, before Sabri continued his race.

[1 markah/ marks]

- ii. Jika laju purata bagi Sabri ialah 32 km j^{-1} , cari nilai y .

If Sabri's average speed is 32 km h^{-1} , find the value of y .

[2 markah/ marks]

Jawapan / Answer:

(a) (i)

(ii)

(b)

(c)

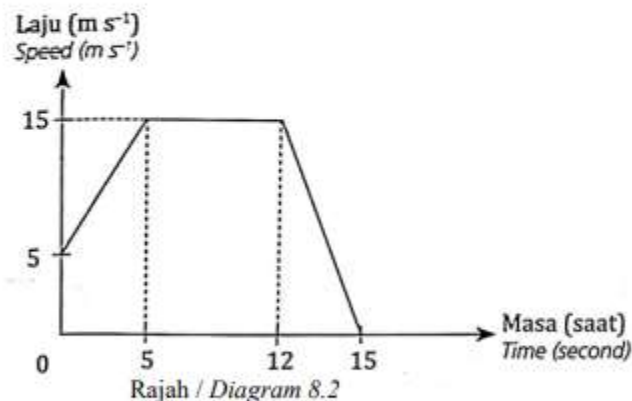
(d) i.

ii.

PEKAN, PAHANG

- (b) Johan menunggang motosikal ke Medan Selera Pekan setiap pagi. Rajah 8.2 di bawah menunjukkan graf laju-masa bagi pergerakan motosikal Johan dari rumah ke persimpangan lampu isyarat sebelum sampai ke medan selera itu.

Johan rides a motorcycle to the Johan Food Court Pekan every morning. Diagram 8.2 shows a speed-time graph for Johan's motorcycle movement from his house to the traffic light junction before he reach at the food court.



- (i) Huraikan gerakan motosikal Johan untuk tempoh 5 saat pertama.

Describe Johan's motorcycle movement for the period of the first 5 seconds.

[1 markah / marks]

- (ii) Apakah yang berlaku terhadap gerakan motorsikal Johan dari saat ke-5 hingga saat ke-12?

What is happen to Johan's motorcycle movement from 5th seconds to 12th seconds?

[1 markah / marks]

- (iii) Hitung kadar perubahan laju terhadap masa, dalam ms^{-2} , bagi 3 saat terakhir.

Calculate the rate of change of speed to time, in ms^{-2} , for the last 3 seconds.

[2 markah / marks]

- (iv) Hitung jarak, dalam m , yang dilalui semasa nyahpecutan dan huraikan gerakan motosikal pada tempoh tersebut.

Calculate the distance, in m , travelled during deceleration and describe the motorcycle movement in the period.

[3 markah / marks]

(b) (i)

(ii)

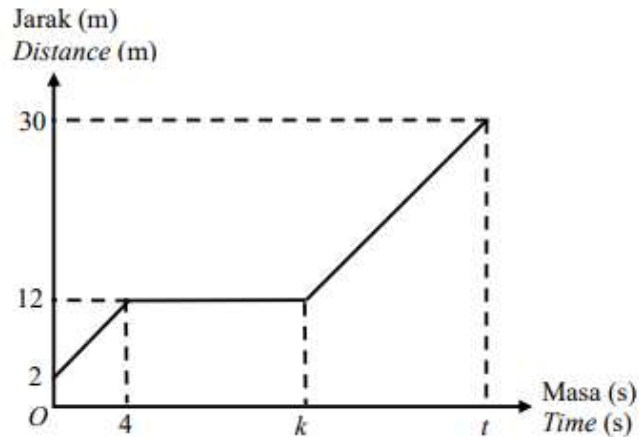
(iii)

(iv)

TERENGGANU

Rajah 4 menunjukkan graf jarak-masa bagi pergerakan suatu zarah dalam tempoh masa t saat.

Diagram 4 shows the distance-time graph for the movement of a particle for a period of t seconds.

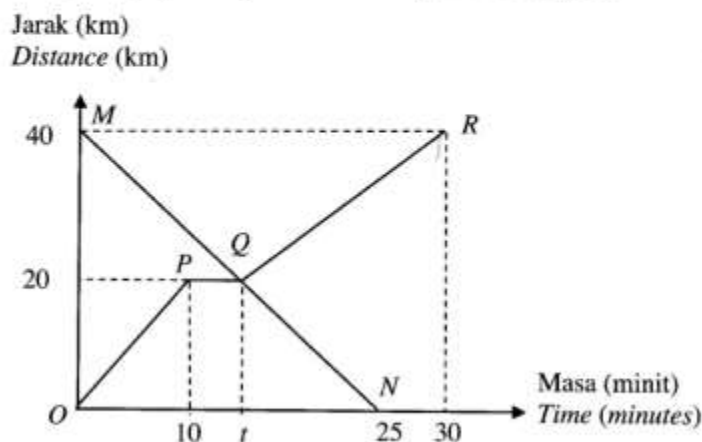


Rajah 4
Diagram 4

- (a) Diberi bahawa tempoh masa zarah itu berhenti ialah 5 s, cari nilai k .
Given that the duration of time the particle is stationary is 5 s, find the value of k .
- (b) Hitung laju dalam ms^{-1} , zarah itu pada 4 saat pertama.
Calculate the speed, in ms^{-1} , of the particle in the first 4 seconds
- (c) Diberi laju purata zarah itu bagi keseluruhan pergerakan ialah 1.4 ms^{-1} .
Cari nilai t .
Given that the average speed of the particle for the whole journey is 1.4 ms^{-1} find the value of t .

Rajah 12 menunjukkan graf jarak-masa bagi perjalanan sebuah bas dan sebuah kereta. Graf $OPQR$ mewakili perjalanan sebuah kereta dari Putrajaya ke Kuala Lumpur. Graf MQN mewakili perjalanan sebuah bas dari Kuala Lumpur ke Putrajaya.

Diagram 12 shows the distance-time graph for the journey of a bus and a car. Graph $OPQR$ represents the journey of a car from Putrajaya to Kuala Lumpur. Graph MQN represents the journey of a bus from Kuala Lumpur to Putrajaya.



Rajah 12
Diagram 12

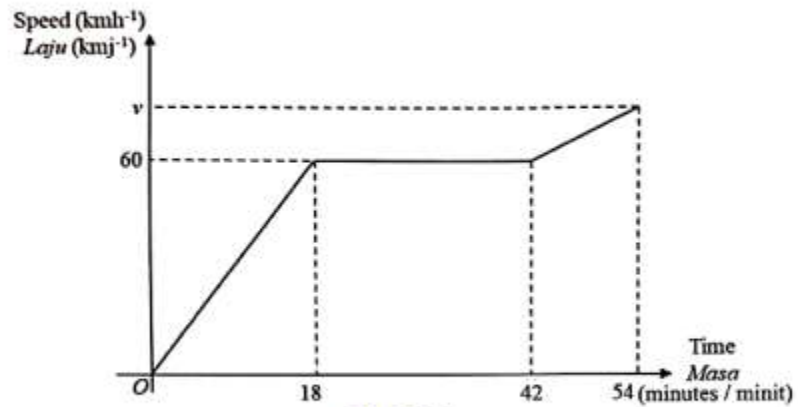
- Hitung nilai t .
Calculate the value of t .
- Kereta tersebut berhenti seketika di stesen minyak.
Nyatakan tempoh, dalam minit, kereta tersebut berada di stesen minyak.
*The car stops at a petrol station.
State the period, in minute, the car at the petrol station.*
- Hitung beza laju purata, dalam kmj^{-1} di antara bas dan kereta.
Calculate the difference of the average speed, in kmh^{-1} , between the bus and the car.
- Sekiranya OP adalah laluan lebuh raya, adakah kelajuan kereta tersebut mematuhi had laju yang ditetapkan? Berikan justifikasi bagi jawapan anda.
If OP is a highway route, does the the car complies with the speed limit? Justify your answer.

[9 markah]

[9 marks]

PERAK

Rajah 7 menunjukkan graf laju-masa bagi perjalanan seorang pemandu bas, Encik Ramu dari Parit Buntar ke Taiping.



Rajah 7

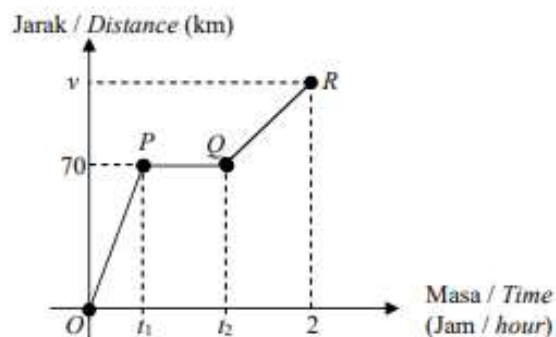
Hitungkan nilai v jika jumlah jarak yang dilalui dalam tempoh 54 minit itu ialah 46.5 km.

[3markah]

SABAH

Rajah 12 menunjukkan graf jarak-masa perjalanan Habib sejauh v km.

Diagram 12 shows the distance-time graph Habib for a distance of v km.



Jadual / Table 12

- (a) Diberi kadar perubahan jarak terhadap masa untuk 70 km yang pertama ialah 70 kmj^{-1} dan berada dalam keadaan pegun selama 30 minit.

It is given that the rate of change in distance for the first 70 km is 70 kmh^{-1} and it is stationary for 30 minutes.

Tentukan / Determine

- (i) nilai / the value of t_1
- (ii) nilai / the value of t_2

- (b) Perjalanannya diteruskan dari Q ke destinasi dengan laju purata 100 kmj^{-1} . Hitung nilai v .

His journey continues from Q to the destination with an average speed of 100 kmh^{-1} . Calculate the value of v .

- (c) Jika perjalanan dari O dimulakan pada pukul 8:30 pagi, hitung waktu Habib sampai di destinasinya.

If the journey from O starts at 8:30 in the morning, calculate the time Habib arrives at his destination.

[9 markah / marks]

Jawapan / Answer :

(a) (i)

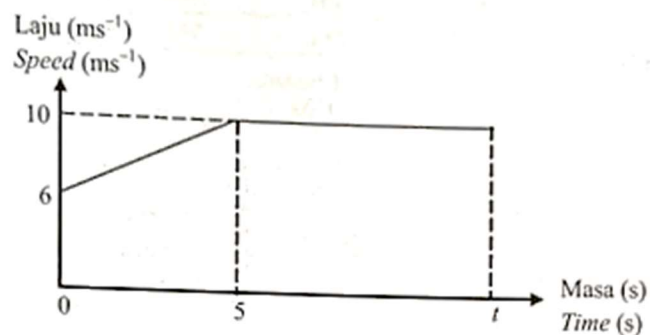
(ii)

(b)

(c)

SELANGOR 1

Graf laju-masa dalam Rajah 7 menunjukkan gerakan suatu objek untuk tempoh t saat.
The speed-time graph in Diagram 7 shows the motion of an object for a period of t seconds.



Rajah 7
Diagram 7

(a) Hitung
Calculate

- (i) laju seragam,
uniform speed,
- (ii) kadar perubahan laju, dalam ms^{-2} , objek itu pada 5 saat pertama.
the rate of change of speed, in ms^{-2} , of the object in the first 5 seconds.

[3 markah]

[3 marks]

(b) Cari nilai t , jika jarak yang dilalui oleh objek pada 5 saat pertama ialah separuh daripada jarak yang dilalui pada kelajuan seragam.

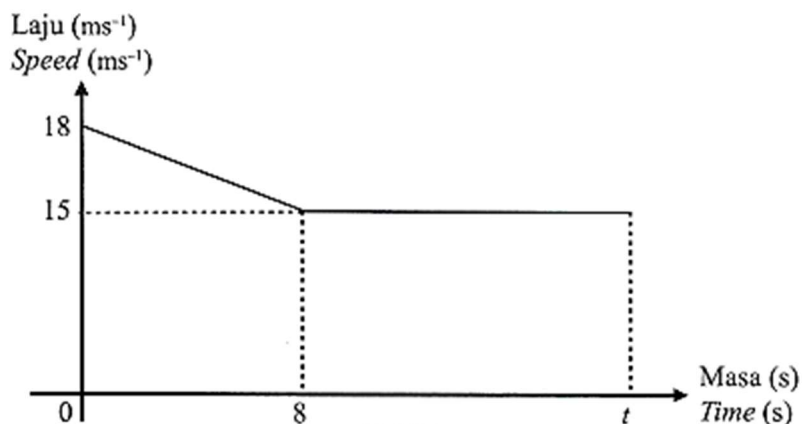
Find the value of t , if the distance travelled by the object for the first 5 seconds is half of the distance travelled at uniform speed.

[3 markah]

[3 marks]

SELANGOR 2

Graf laju-masa dalam Rajah 8 menunjukkan gerakan suatu objek untuk tempoh t saat.
The speed-time graph in Diagram 8 shows the motion of an object for a period of t seconds.



- (a) Hitung kadar perubahan laju dalam ms^{-2} , objek itu pada 8 saat pertama.
Calculate the rate of change of speed, in ms^{-2} , of the object in the first 8 seconds.
- (b) Cari nilai t , dalam s, jika jarak yang dilalui oleh objek pada 8 saat pertama ialah separuh daripada jarak yang dilalui pada kelajuan seragam.
Find the value of t , in s, if the distance travelled by the object for the first 8 seconds is half of the distance travelled at uniform speed.

[3 markah]
[3 marks]

[4 markah]
[4 marks]

Jawapan / Answer :

(a)

(b)