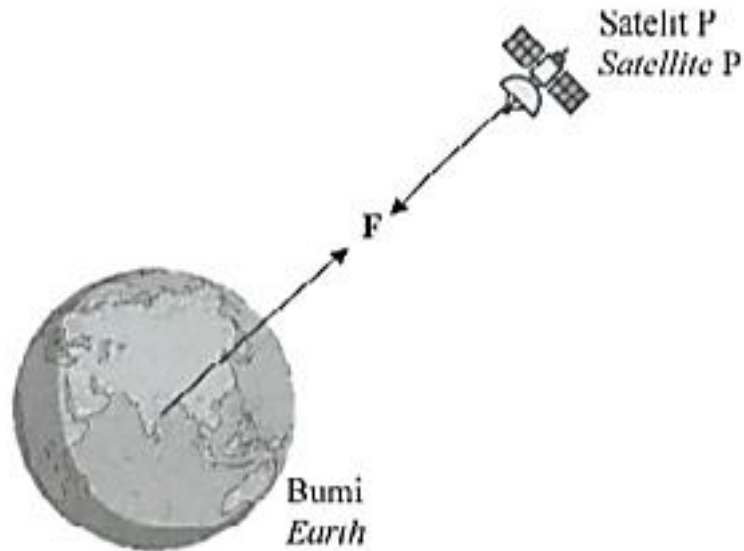


KOLEKSI SOALAN-SOALAN KERTAS 2 FIZIK PERCUBAAN SPM 2024
BAB 3 TINGKATAN 4: KEGRAVITIAN / GRAVITATIONAL

MRSM 2024

- 1** Rajah 1 menunjukkan sebuah satelit P mengorbit bumi pada ketinggian tetap.
Diagram 1 shows a satellite P orbiting the Earth at constant height.



Rajah 1
 Diagram 1

- (a) Tandakan (\checkmark) bagi jawapan yang betul dalam kotak yang disediakan.
Tick (\checkmark) the correct answer in the box provided.

Hukum fizik yang menjelaskan daya F ialah
Physics law that explains force F is

- Hukum Kegravitian Semesta Newton
Newton's Universal Law of Gravitation
- Hukum Gerakan Newton Pertama
Newton's First Law of Motion

[1 markah]
 [1 mark]

- (b) Namakan daya **F**.
*Name the force **F**.*

.....
[1 markah]
[1 mark]

- (c) Jika satelit P mengorbit pada ketinggian yang sama mengelilingi planet yang berjirim lebih besar, apakah yang akan berlaku pada kuantiti fizik di 1(b)?

If satellite P orbiting at the same height around a planet with bigger mass, what happen to the physical quantity in 1(b)?

.....
[1 markah]
[1 mark]

- (d) Satelit P mengalami kerosakan teknikal dan jatuh mendekati Bumi. Nyatakan perubahan yang berlaku kepada pecutan graviti.

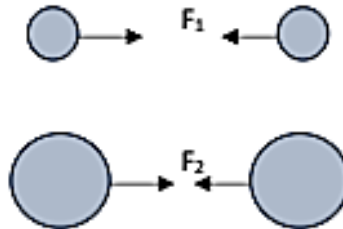
Satellite P experiences technical damage and fall towards the Earth. State the change to the gravitational acceleration.

.....
[1 markah]
[1 mark]

PERLIS 2024

2. Rajah 2 menunjukkan kesan terhadap daya graviti disebabkan oleh jisim antara dua jasad.

Diagram 2 shows the effect of mass between two bodies on gravitational force.



Rajah / Diagram 2

- (a) Namakan daya F_1 dan F_2 yang bertindak ke atas dua jasad di atas.

Name the force F_1 and F_2 acted on the two bodies as above.

[1 markah/ mark]

- (b) Tentukan magnitud daya graviti jika jasad dengan jisim lebih besar digunakan.

Determine the magnitude of gravitational force if the larger masses of bodies are used.

[1 markah/ mark]

(c) Hitung daya graviti antara Bumi dengan satelit buatan manusia. Diberi

Calculate the gravitational force between the Earth and the man-made satellite.

Given

[Jisim Bumi / *Mass of the Earth*: 5.97×10^{24} kg]

[Jejari Bumi / *Radius of the Earth*: 6.37×10^8 m]

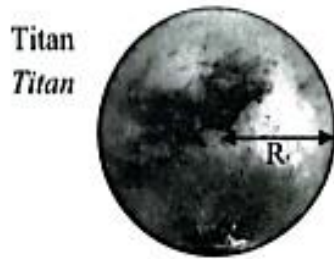
[Jisim satelit / *Mass of the satellite*: 1.20×10^3 kg]

[Jarak Bumi dengan satelit / *Distance of Earth and satellite*: 4.22×10^7 m]

[3 markah / *marks*]

SBP 2024

- 2 Titan adalah bulan yang mengorbit planet Zuhal. Jisim, M dan jejari, R bagi Titan masing-masing adalah 1.35×10^{23} kg dan 2575 km.
Titan is a moon that orbits the planet Saturn. The mass, M and the radius, R of Titan are 1.35×10^{23} kg and 2575 km respectively.



Rajah 2
 Diagram 2

Sebuah roket berjisim 1×10^5 kg dilancarkan secara menegak dari permukaan Titan dengan halajunya adalah sama dengan halaju lepas Titan.
A rocket of mass 1×10^5 kg is launched vertically from the surface of Titan with a velocity equal to escape velocity of Titan.

- (a) Apakah yang dimaksudkan dengan halaju lepas?
What is meant by escape velocity?

.....
 [1 markah]
 [1 mark]

- (b) Hitung halaju lepas Titan tersebut.
Calculate the escape velocity of Titan.

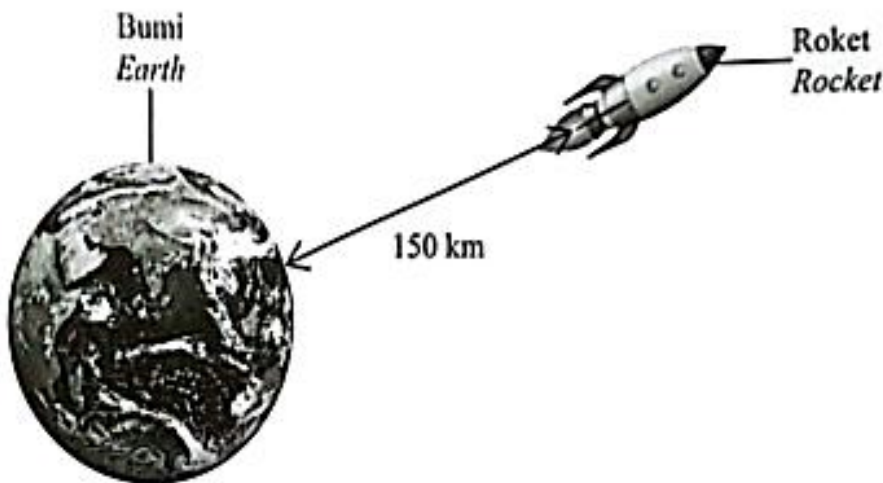
[3 markah]
 [3 marks]

- (c) Nyatakan perubahan kepada halaju lepas dalam 2(b) jika jisim roket tersebut adalah dua kali ganda jisim asalnya?
State the change in escape velocity in 2(b) if the mass of rocket is twice its original mass?

[1 markah]
 [1 mark]

SELANGOR (MODUL PINTAS) SET 1 2024

- 3 Rajah 3 menunjukkan kedudukan Bumi dan sebuah roket.
Diagram 3 shows the position of the Earth and a rocket.



Rajah 3
 Diagram 3

Daya graviti yang bertindak antara Bumi dan roket diterangkan oleh Hukum Kegravitian Semesta Newton.

The gravitational force acting between the Earth and the rocket is described by Newton's Universal Law of Gravitation.

- (a) Nyatakan Hukum Kegravitian Semesta Newton.
State the Newton's Universal Law of Gravitation.

.....

.....

.....

[1 markah]
 [1 mark]

- (b) Diberi; Pemalar kegravitian, $G = 6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$
 Jejari Bumi = $6.37 \times 10^6 \text{ m}$
 Jisim Bumi = $5.97 \times 10^{24} \text{ kg}$
 Jisim roket = $5.0 \times 10^4 \text{ kg}$

Given; Gravitational constant, $G = 6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$
 Radius of the Earth = $6.37 \times 10^6 \text{ m}$
 Mass of the Earth = $5.97 \times 10^{24} \text{ kg}$
 Mass of the rocket = $5.0 \times 10^4 \text{ kg}$

Berdasarkan Rajah 3, hitung daya graviti antara Bumi dan roket pada ketinggian tersebut.

Based on Diagram 3, calculate the gravitational force between the Earth and the rocket at that height.

Daya graviti : N

Gravitational force

[3 markah]

[3 marks]

- (c) Apakah perubahan yang berlaku kepada daya graviti dalam 3(b) jika:

What are the changes occurring to the gravitational force in 3(b) if:

- (i) ketinggian roket berkurang

the height of the rocket decrease

.....
 [1 markah]

[1 mark]

- (ii) jisim roket berkurang

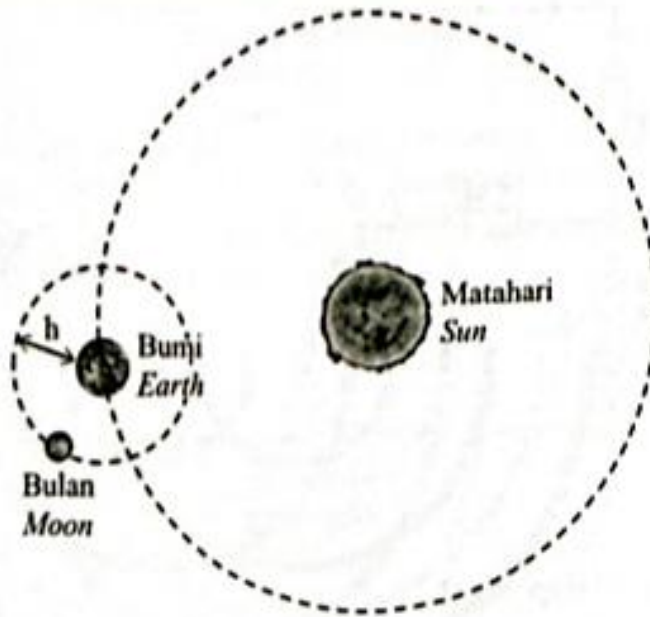
the mass of the rocket decrease

.....
 [1 markah]

[1 mark]

SELANGOR (MODUL PINTAS) SET 2 2024

- 3** Rajah 3 menunjukkan Bulan mengorbit Bumi, manakala Bumi mengorbit Matahari.
Diagram 3 shows the Moon orbiting the Earth, while the Earth orbits the Sun.



Rajah 3
Diagram 3

Daya graviti antara Matahari, Bumi dan Bulan dapat ditentukan menggunakan Hukum Kegravitian Semesta Newton.

The gravitational force between the Sun, Earth and Moon can be determined using Newton's Universal Law of Gravitation.

- (a) Apakah Hukum Kegravitian Semesta Newton?
What is Newton's Universal Law of Gravitation?

.....

.....

.....

[1 markah]
[1 mark]

- (b) Berdasarkan Rajah 3, bandingkan daya graviti antara Bumi dan Bulan, dengan Bumi dan Matahari.

Berikan sebab.

Based on Diagram 3, compare the gravitational force between the Earth and the Moon, with the Earth and the Sun.

Give a reason.

.....

.....

[2 markah]

[2 marks]

- (c) Diberi; Jisim Bulan = 7.35×10^{22} kg
 Jisim Bumi = 5.97×10^{24} kg
 Jejari Bumi = 6.37×10^6 m
 Daya graviti antara Bumi dan Bulan = 2.00×10^{20} N
 Pemalar kegravitian semesta, $G = 6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$

Hitung ketinggian Bulan dari permukaan Bumi, h.

*Given; Mass of Moon = 7.35×10^{22} kg
 Mass of the Earth = 5.97×10^{24} kg
 Radius of the Earth = 6.37×10^6 m
 Gravitational force between the Earth and the Moon = 2.00×10^{20} N
 Universal gravitational constant, $G = 6.67 \times 10^{-11} \text{ N m}^2 \text{ kg}^{-2}$*

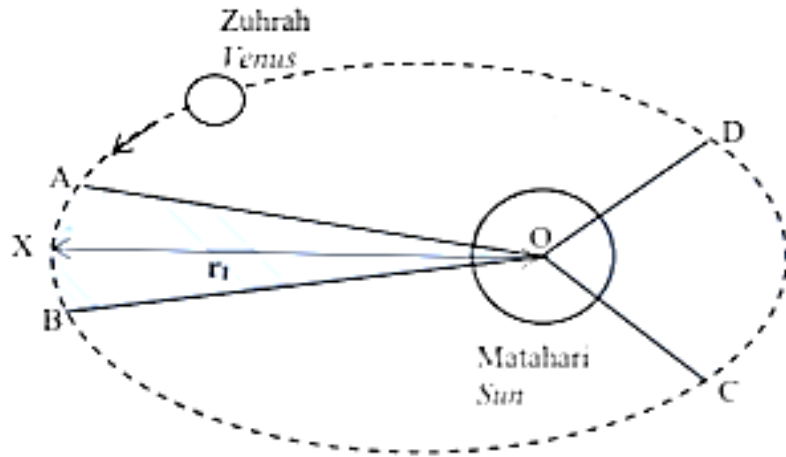
Calculate the height of the Moon from the Earth's surface, h.

[3 markah]

[3 marks]

PAHANG JUJ SET 1 2024

- 3** Rajah 3 menunjukkan planet Zuhrah yang mengorbit mengelilingi Matahari. Luas yang dicakupi oleh AOB dan COD adalah sama dalam selang masa yang sama. [$r_1 = 1.08 \times 10^{11}$ m dan jisim Matahari, $M = 1.989 \times 10^{30}$ kg]
 Diagram 3 shows the planet Venus orbiting around the Sun. The area sweeps out by AOB and COD is equal in the same time interval. [$r_1 = 1.08 \times 10^{11}$ m and mass of the Sun, $M = 1.989 \times 10^{30}$ kg]



Rajah 3/ Diagram 3

- (a) Nyatakan hukum fizik yang terlibat.
 State physics law involved.

.....

[1 markah/ 1 mark]

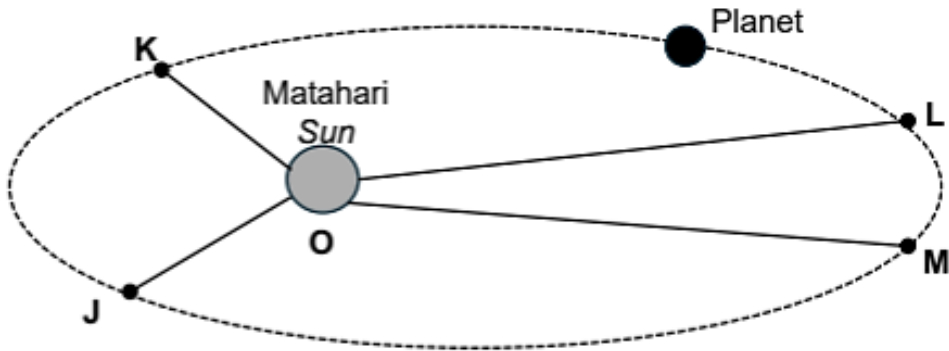
- (b) (i) Tentukan nilai laju linear planet Zuhrah di titik X.
 Determine the value of the linear speed of the Venus at point X.

[2 markah/ 2 marks]

YIK 2024

3. Rajah 3 menunjukkan sebuah planet mengelilingi matahari dalam satu orbit. Tempoh yang dilalui oleh planet dari J ke K adalah sama dengan tempoh dari L ke M. Luas OJK adalah sama dengan luas OLM.

Diagram 3 shows a planet going around the sun in one orbit. The period traveled by the planet from J to K is equal to the period from L to M. The area of OJK is equal to the area of OLM.



Rajah 3 / Diagram 3

- a) Berdasarkan Rajah 3, apakah hukum fizik yang terlibat?
Based on Diagram 3, what are the laws of physics involved?

.....
 [1 markah/1 mark]

- b) (i) Gariskan jawapan yang betul.
Underline the correct answer.

Laju linear dari J ke K **lebih / kurang** daripada L ke M.
*Linear speed from J to K is **more / less** than L to M.*

[1 markah/1 mark]

- (ii) Berikan sebab bagi jawapan anda di b(i).
Give reasons for your answer in b(i).

.....
 [1 markah/1 mark]

- c) Hitung tempoh orbit bagi planet dalam unit jam jika jarak purata dari pusat matahari ke orbit ialah 2.5×10^{11} m.

[Jisim matahari = 1.99×10^{30} kg]

Calculate the orbital period of the planet in units of hours if the average distance from the center of the sun to the orbit is 2.5×10^{11} m.

[Mass of the sun = 1.99×10^{30} kg]

Diberi :

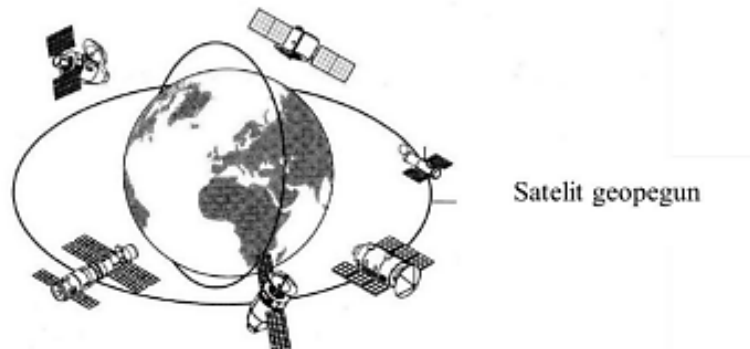
Given:

$$T^2 = \frac{4\pi^2 r^3}{GM}$$

[3 markah/3 marks]

SARAWAK (BETONG) 2024

- 4 Rajah 4 menunjukkan beberapa satelit buatan manusia daripada pelbagai negara.
Diagram 4 shows a few man-made satellites from various countries.



Rajah 4/ Diagram 4

- (a) Apakah maksud satelit geopegun?
What is meant by geostationary satellites?

.....

[1 markah/mark]

- (b) Nyatakan **dua** ciri satelit geopegun.
State two characteristics of a geostationary satellite.

.....

.....

[2 markah/marks]

- (c) Sebuah satelit geopegun 1200 kg diletakkan sejauh 4.23×10^7 m dari pusat Bumi.

Hitung:

A geostationary satellite of mass 1200 kg is placed at 4.23×10^7 m from the center of the Earth.

Calculate:

- (i) Laju linear satelit itu.

Linear speed of the satellite

[jisim Bumi/mass of Earth = 5.97×10^{24} kg]

[2 markah/marks]

- (ii) Daya tarikan graviti Bumi terhadap satelit itu.

The Earth's gravitational field pulls on the satellite.

[2 markah/marks]

- (d) Apakah yang berlaku ke atas satelit jika lajunya kurang daripada laju mengorbitnya?

What happens to the satellite if the speed is lower than the orbital speed?

.....

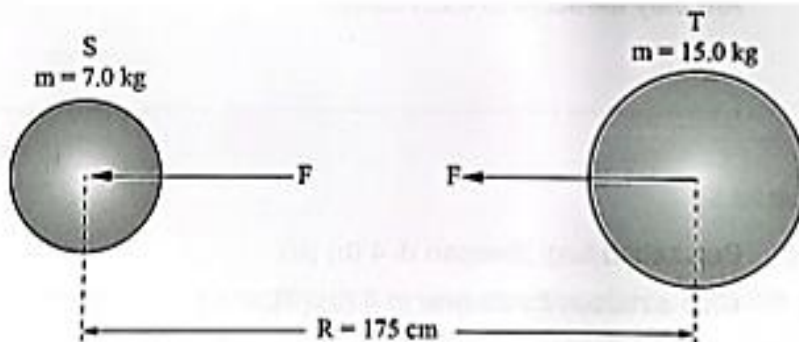
.....

[2 markah/marks]

PERAK 2024

- 4 Rajah 4.1 menunjukkan dua jasad S dan T yang berbeza jisim pada jarak R antara satu sama lain. Daya graviti, F boleh dijelaskan dengan Hukum Kegravitian Semesta Newton.

Diagram 4.1 shows two bodies S and T of different masses at a distance R between each other. The gravitational force, F can be explained by Newton's Universal Law of Gravitation.



Rajah 4.1
Diagram 4.1

- (a) Nyatakan Hukum Kegravitian Semesta Newton.
State Newton's Universal Law of Gravitation.

.....

[1 markah / 1 mark]

(b) Berdasarkan Rajah 4.1,
Based on Diagram 4.1,

(i) Hitung berat S dan T.
Calculate the weight of S and T.

S :

T :

[2 markah / 2 marks]

(ii) Hitung daya, F antara S dan T.
Calculate the force, F between S and T.

[2 markah / 2 marks]

(iii) Adakah kedua-dua jasad tertarik antara satu sama lain?
Are they attracted to each other?

.....

[1 markah / 1 mark]

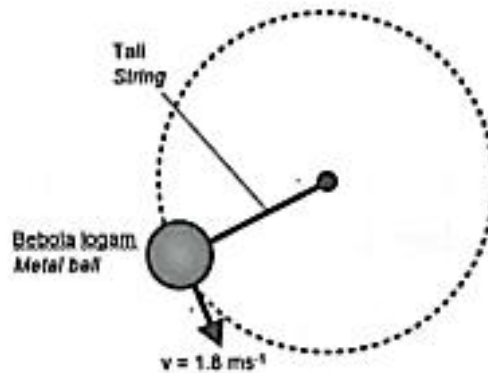
(iv) Beri sebab bagi jawapan di 4 (b) (iii).
Give a reason for answer in 4 (b) (iii).

.....

[1 markah / 1 mark]

- (c) Rajah 4.2 menunjukkan sebuah bobola logam berjisim 75 g diikat pada hujung satu tali yang panjangnya 0.8 m dipusingkan dalam bulatan mengufuk dengan kelajuan 1.8 m s^{-1} .

Diagram 4.2 shows a metal ball of mass 75 g is tied to the end of a string 0.8 m long which is rotated in a horizontal circle with a speed of 1.8 m s^{-1} .



Rajah 4.2

Diagram 4.2

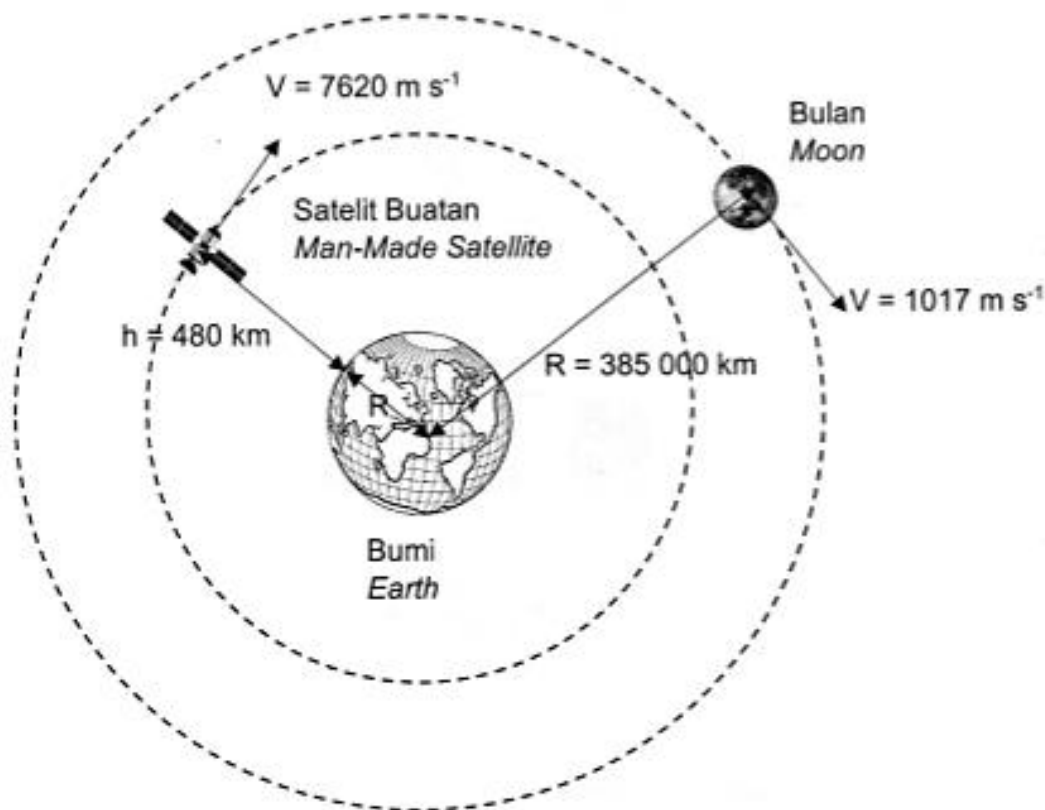
Hitung tegangan tali.

Calculate the tension of the string.

[2 markah / 2 marks]

TERENGGANU 2024

5. Rajah 5 menunjukkan sebuah satelit buatan dan bulan sedang mengorbit bumi. Satu daya bertindak ke atas satelit dan bulan yang membolehkan kedua-duanya bergerak dalam keadaan membulat. Tempoh mengorbit bumi bagi satelit dan bulan masing-masing mengambil masa 1.5 jam dan 27.3 hari.
 Diagram 5 shows the man-made satellite and the moon orbiting the Earth. A force acts on the satellite and the moon that allows them to move in a circular state. The period of orbiting the Earth by the satellite and the moon takes 1.5 hours and 27.3 days respectively



Rajah 5
 Diagram 5

- (a) Namakan daya yang menyebabkan satelit buatan dan bulan bergerak dalam orbit membulat.
 Name the force that cause the man-made satellites and the moon to move in circular orbit.

[1 markah]
 [1 mark]

(b) Berdasarkan rajah 5, bandingkan
Based on diagram 5, compare

(i) Jejari orbit satelit buatan dengan bulan.
The orbital radius of the man-made satellite with the moon.

.....

[1 markah]
[1 mark]

(ii) Tempoh satelit buatan dengan bulan.
The period of the man-made satellites with the moon.

.....

[1 markah]
[1 mark]

(iii) Laju linear satelit buatan dengan bulan
Linear speed of the man-made satellite with the moon.

.....

[1 markah]
[1 mark]

(c) Berdasarkan kepada jawapan anda dalam (b)(i), (b)(ii) dan (b)(iii), nyatakan hubungan
Based on your answers in (b)(i), (b)(ii) and (b)(iii), state relationship

(i) laju linear dan jejari orbit.
linear velocity and orbital radius.

.....

[1 markah]
[1 mark]

(ii) tempoh dan jejari orbit.
the period and the orbital radius

.....

[1 markah]
[1 mark]

(d) Apakah akan berlaku kepada satelit buatan jika laju linearnya lebih rendah daripada laju linear orbit?
What will happen to the man-made satellite if its linear speed is lower than its orbital linear speed?

.....

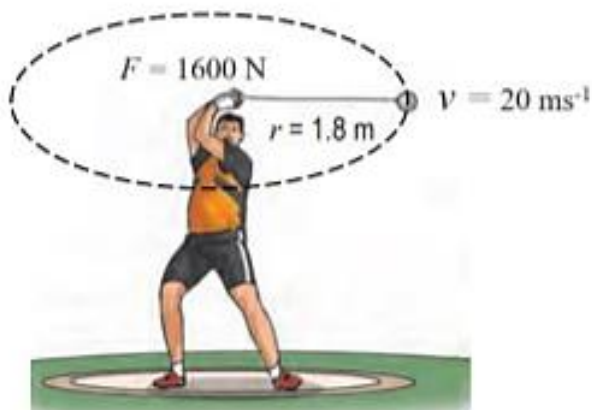
[1 markah]
[1 mark]

- (e) Jika jisim satelit buatan dalam Rajah 5 adalah 400 kg, hitung daya yang bertindak ke atas satelit buatan itu yang menyebabkan ianya kekal bergerak dalam orbit.
[jejari bumi: 6.37×10^6 m]
If the mass of the man-made satellite in Diagram 5 is 400 kg, calculate the force acting on the artificial satellite that causes it to remain its motion orbiting.
[radius of Earth: 6.37×10^6 m]

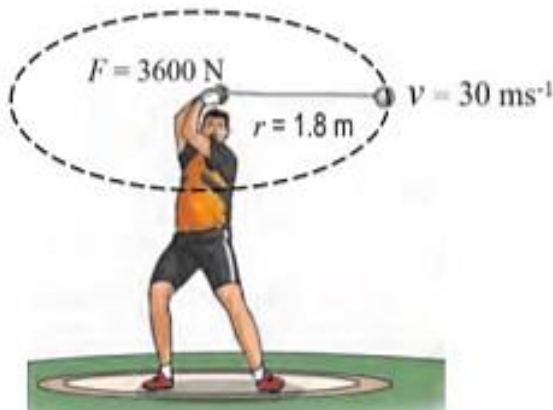
[2 markah]
[2 marks]

SMKA & SABK 2024

5. Rajah 5.1 dan Rajah 5.2 menunjukkan seorang atlet acara lontar tukul besi yang sedang memutar tukul besi dalam suatu bulatan ufuk dengan menggunakan daya memusat. *Diagram 5.1 and Diagram 5.2 show a hammer throw athlete who is rotating the hammer in a horizontal circle using centripetal force.*



Rajah 5.1
Diagram 5.1



Rajah 5.2
Diagram 5.2

- (a) Apakah maksud daya memusat?
What is the meaning of centripetal force?

.....
[1 markah]
[1 mark]

- (b) Perhatikan Rajah 5.1 dan Rajah 5.2, Bandingkan
Observe Diagram 5.1 and Diagram 5.2, Compare

- (i) daya memusat, F
centripetal force, F

.....
[1 markah]
[1 mark]

- (ii) laju linear, v
linear speed, v

.....
[1 markah]
[1 mark]

- (iii) panjang tali, r
length of the rope, r

.....
[1 markah]
[1 mark]

(c) Berdasarkan jawapan anda di 5(b)
Based on your answer in 5(b)

(i) Hubungkan antara daya memusat, F dan laju linear, v
Relate the centripetal force, F and the linear speed, v

.....
.....
[1 markah]
[1 mark]

(ii) Namakan satu daya yang mempunyai magnitud yang sama dengan daya memusat
Name one force that has the same magnitude as the centripetal force

.....
[1 markah]
[1 mark]

(d) Rajah 5.3 menunjukkan situasi lain melibatkan acara lontar tukul besi.
Diagram 5.3 shows another situation involving the hammer throw event.



Rajah 5.3
Diagram 5.3

(i) Tukul dalam Rajah 5.3 berjisim 5 kg diputar dalam bulatan mengufuk jejari 1.5 m dengan laju linear 20 ms^{-1} . Hitung tegangan tali, T yang bertindak ke atas tukul itu.
The hammer in Diagram 5.3 has a mass 5 kg and is rotated in a horizontal circle of radius 1.5 m with a linear speed of 20 ms^{-1} . Calculate the rope tension, T acting on the hammer.

[2 markah]
[2 marks]

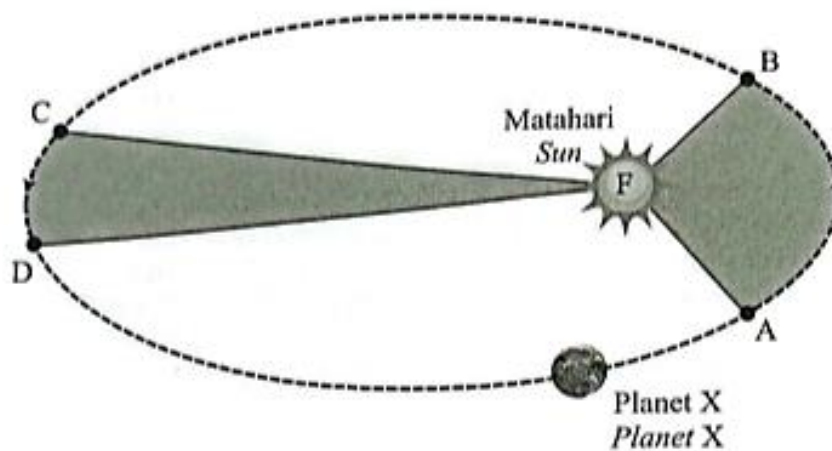
- (ii) Apakah yang berlaku kepada tegangan tali, T sekiranya panjang tali bertambah?
 What happens to the rope tension, T if the length of the string increases?

[1 markah]

[1 mark]

JOHOR 2024

- 5 Rajah 5 menunjukkan sebuah planet mengelilingi Matahari. Masa yang diambil oleh planet untuk bergerak dari A ke B adalah sama dari C ke D.
 Diagram 5 shows a planet revolved the Sun. The time taken for the planet to travel from A to B is equal from C to D.



Rajah 5 / Diagram 5

- (a) Nyatakan bentuk orbit
 State the shape of the orbit

[1 markah/ 1 mark]

- (b) Berdasarkan Rajah 5,
 Based on Diagram 5,

- (i) Bandingkan luas yang dicakupi oleh planet di FAB dan FCD
 Compare the area covered by the planet at region FAB and FCD

[1 markah/ 1 mark]

- (ii) Bandingkan panjang lengkok orbit AB dan CD
 Compare the arc length of orbit AB and CD

[1 markah/ 1 mark]

- (iii) Bandingkan laju planet di AB dan CD
Compare the speed of planet at AB and CD

.....
[1 markah/ 1 mark]

- (iv) Nyatakan hubungan antara masa yang diambil untuk bergerak dari A ke B dan C ke D dengan luas yang dicakupi bagi kedua-dua kawasan.
State the relationship between the time taken to moves from A to B and C to D with area covered at both regions.

.....
[1 markah/ 1 mark]

- (c) Nyatakan hukum yang terlibat bagi menerangkan jawapan anda di 5(b)(iv)
State the law involved to explain your answer in 5(b)(iv)

.....
[1 markah/ 1 mark]

- (d) Jelaskan hukum di 5(c)
Explain the law in 5(c)

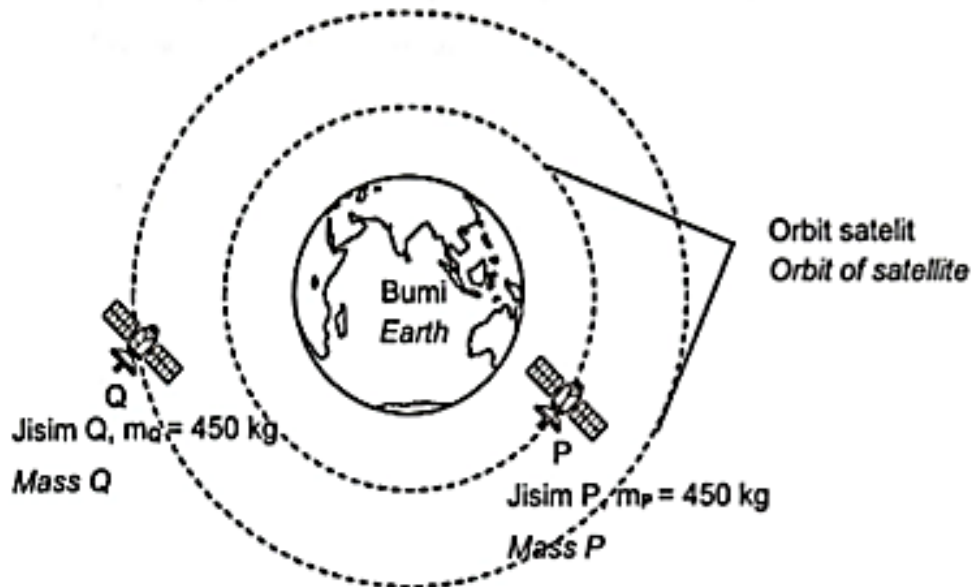
.....
[1 markah/ 1 mark]

- (e) Planet X itu berjisim 1.90×10^{27} kg dan berjajari 6.99×10^7 m. Kirakan halaju lepas planet X itu.
The planet X with mass 1.90×10^{27} kg and radius 6.99×10^7 m. Calculate the escape velocity of the planet X.

.....
[2 markah/ 2 marks]

KEDAH 2024

- 5 Rajah 5 menunjukkan dua satelit P dan Q mengelilingi Bumi.
 Diagram 5 shows two satellites P and Q evolve around the Earth.



Rajah 5
 Diagram 5

- (a) Apakah maksud jisim?
 What is the meaning of mass?

.....

[1 markah]
 [1 mark]

- (b) Berdasarkan Rajah 5,
 Based on Diagram 5,

- (i) Bandingkan jisim satelit P dan Q.
 Compare the mass of satellite P and Q.

.....

[1 markah]
 [1 mark]

- (ii) Bandingkan jejari orbit bagi satelit P dan Q.
Compare the orbital radius of satellite P and Q.

.....
[1 markah]
[1 mark]

- (iii) Bandingkan tempoh orbit bagi satelit P dan Q.
Compare the orbital period of satellite P and Q.

.....
[1 markah]
[1 mark]

- (c) Nyatakan hubungan antara jejari orbit dan tempoh orbit.
State the relationship between orbital radius and orbital period.

.....
.....
[1 markah]
[1 mark]

- (d) (i) Apakah yang akan terjadi kepada tempoh orbit jika jisim satelit P ditambah?
What will happen to the orbital period if the mass of satellite P increased?

.....
[1 markah]
[1 mark]

- (ii) Terangkan jawapan anda di 5(d)(i).
Explain your answer in 5(d)(i).

.....
.....
[1 markah]
[1 mark]

- (e) Jika satelit Q berada pada jarak 17 000 000 m dari pusat Bumi, tentukan tempoh orbit bagi satelit tersebut.

If the satellite Q is at a distance 17 000 000 m from the centre of the Earth, determine the orbital period of the satellite.

Diberi, $T^2 = \frac{4\pi^2 r^3}{GM}$
Given,

[Jisim Bumi, $M = 5.97 \times 10^{24}$ kg]

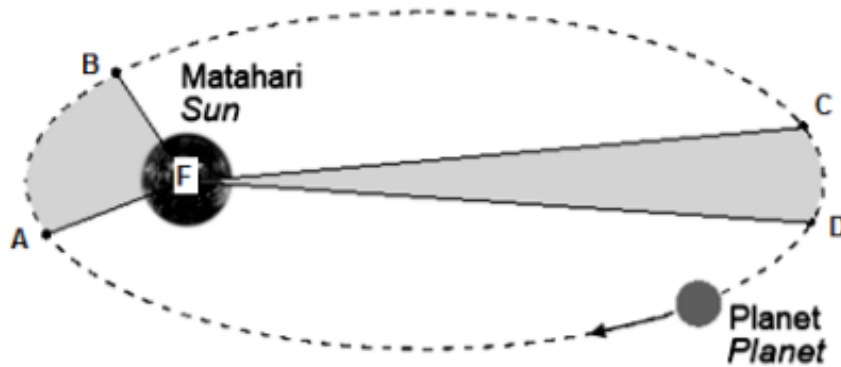
[*Mass of Earth*, $M = 5.97 \times 10^{24}$ kg]

[2 markah]

[2 marks]

KELANTAN 2024

- 5 Rajah 5.1 menunjukkan sebuah planet mengelilingi matahari. Masa yang diambil untuk planet bergerak dari A ke B adalah sama dari C ke D.
 Diagram 5.1 shows a planet evolves the sun. The time taken for the planet to travel from A to B is equal from C to D.



Rajah 5.1
 Diagram 5.1

- (a) Nyatakan Hukum Kepler Kedua.
 State Kepler's Second Law.

.....
 [1 markah]
 [1 mark]

- (b) Berdasarkan Rajah 5.1, bandingkan
 Based on Diagram 5.1, Compare

- (i) panjang lengkok orbit bagi AB dan CD.
 the arc length of orbit AB and CD.

.....
 [1 markah]
 [1 mark]

- (ii) luas yang dicakupi oleh planet di kawasan AFB dan CFD.
 the area covered by the planet at region AFB and CFD.

.....
 [1 markah]
 [1 mark]

- (iii) laju linear A ke B dan C ke D.
 the linear speed of A to B and C to D.

.....
 [1 markah]
 [1 mark]

- (c) (i) Nyatakan hubungan antara panjang lengkok dengan laju linear yang dicakupi bagi kedua-dua kawasan.

State the relationship between the arc length and the linear speed covered at both regions.

.....

[1 markah]

[1 mark]

- (ii) Namakan daya yang bertindak ke atas planet yang sedang mengorbit matahari seperti dalam Rajah 5.1.

Name the force that acts on the planet when it is orbiting the sun as shown in Diagram 5.1.

.....

[1 markah]

[1 mark]

- (d) Rajah 5.2 menunjukkan sebuah satelit yang mengorbit Bumi.

Diagram 5.2 shows a satellite orbiting the Earth.



Rajah 5.2
Diagram 5.2

- (i) Tandakan arah laju linear yang bertindak ke atas satelit dalam Rajah 5.2.

Mark the direction of linear speed in Diagram 5.2.

[1 markah]

[1 mark]

(ii) Satelit tersebut telah sampai ke angkasa lepas dan sedang mengorbit bumi pada ketinggian, $h = 2.0 \text{ Mm}$. Hitung laju linear satelit ketika mengorbit bumi.

[Diberi jisim bumi, $M = 5.97 \times 10^{24} \text{ kg}$ dan jejari bumi, $R = 6.37 \times 10^6 \text{ m}$]

The satellite has reach outer space and is orbiting the earth at an altitude, $h = 2.0 \text{ Mm}$.

Calculate the linear speed of satellite when it is orbiting earth.

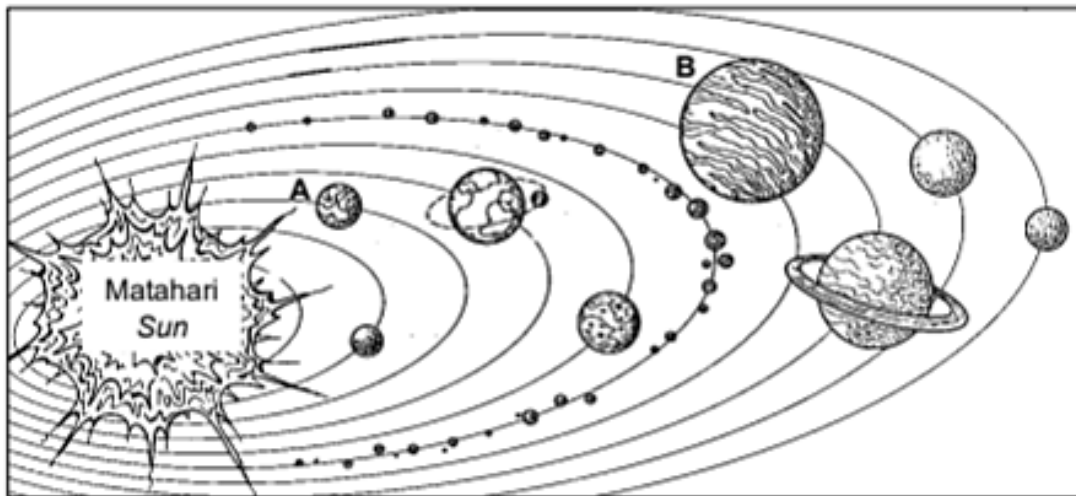
[Given earth's mass, $M = 5.97 \times 10^{24} \text{ kg}$ and earth's radius, $R = 6.37 \times 10^6 \text{ m}$]

[2 markah]

[2 mark]

MELAKA 2024

- 6 Rajah 6 menunjukkan sistem suria.
Diagram 6 shows the solar system.



Rajah 6
Diagram 6

- (a) Tandakan (✓) pada petak jawapan yang betul.
Tick (✓) in the box for the correct answer.

Nyatakan bentuk orbit planet-planet.
State the shape of orbits of the planets.

Bulat
Circle

Sfera
Sphere

Elips
Ellipse

[1 markah]
[1 mark]

- (b) Perhatikan Rajah 6, bandingkan planet A dan planet B dari segi
Observe Diagram 6, compare planet A and planet B in term of

- (i) jisim.
mass.

.....
[1 markah]
[1 mark]

- (ii) jejari orbit.
radius of orbit.

.....
[1 markah]
[1 mark]

- (iii) tempoh orbit.
orbital period.

.....
[1 markah]
[1 mark]

- (c) Hubungkan jejeri orbit dengan tempoh orbit
Relate between radius of orbit with orbital period.

.....
[1 markah]
[1 mark]

- (d) Namakan hukum yang terlibat dalam 6(c).
Name the law involves in 6(c).

.....
[1 markah]
[1 mark]

- (e) Diberi
Given

Jejeri orbit Bumi, $R = 150 \text{ Gm}$.

Tempoh orbit planet B, $T = 11.9 \text{ tahun}$

Radius of orbit Earth, $R = 150 \text{ Gm}$

Orbital period of planet B, $T = 11.9 \text{ years}$

Hitungkan jejeri orbit planet B.

Calculate the radius of orbit planet B.

[3 markah]
[3 marks]