# JAWAPAN

## BAB 7 Tenaga dan Kuasa
## *Energy and Power*

### PBD 7.1 Kerja, Tenaga dan Kuasa
*Wok, Energy and Power*

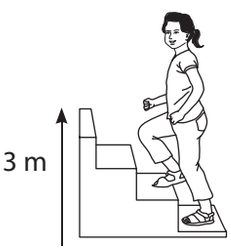
**1.** Hasil darab daya dan sesaran dalam arah daya.
*The product of force and displacement in the direction of force.*

**2.**

| | |
|---|---|
| **Daya** *Force* | Panjang *Length* |
| Jisim *Mass* | **Sesaran** *Displacement* |

**3.** (a), (d)

**4.**




$W = Fs$
$= 400\ \text{N} \times 3\text{m}$
$= 1200\ \text{J}$

**5.** (a) Tidak / *No*
(b) Kereta yang ditolaknya tidak bergerak. Oleh itu, sesarannya ialah sifar.
*The car that he pushed did not move. Therefore, the displacement is zero.*

**6.** Jawapan murid
*Student's answer*

1. Aktiviti A / Activity A
Daya geseran / *Frictional force*
Aktiviti B / Activity B
Daya graviti / *Gravitational force*
2. Semakin besar daya yang dikenakan, semakin besar kerja yang dilakukan.
*The bigger the force applied, the bigger the work done.*

**7.** (a) Dia mengangkat beban dengan sesaran 2 meter.
*He lifted the load with 2 metre displacement.*
(b) (i) Kerja dilakukan
*Workdone*
= Daya / *Force* × Sesaran / *Displacement*
= 25 kg × 10 Newton × 2 meter / *metre*
= 500 J

(ii) Kuasa / *Power* $= \dfrac{\text{Kerja / } \textit{Work}}{\text{Masa / } \textit{TIme}}$
$= \dfrac{500\ \text{J}}{10\ \text{s}}$
$= 50\ \text{W}$

**8.** (i) Kerja / *Work* = Daya / *Force* × Sesaran / *Displacement*
$= 800\ \text{N} \times 3\ \text{m}$
$= 2400\ \text{J}$

(ii) Kuasa / *Power* $= \dfrac{\text{Kerja / } \textit{Work}}{\text{Masa / } \textit{Time}}$
$= 2400\ \text{J} / 60\ \text{s}$
$= 40\ \text{W}$

### PBD 7.2 Tenaga Keupayaan dan Tenaga Kinetik
*Potential Energy and Kinetic Energy*

**1.** (a), (d)

**2.** (b), (d)

**3.**

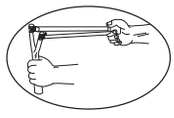
| **Jarak (cm)** *Distance (cm)* | **Kerja (J)** *Work (J)* | **Tenaga keupayaan graviti (J)** *Gravitational potential energy (J)* |
|---|---|---|
| 4 | 0.8 | 0.8 |
| 8 | 1.6 | 1.6 |
| 12 | 2.4 | 2.4 |

Tenaga keupayaan graviti = Kerja yang dilakukan
*Gravitational potential energy = Work done*

**4.** (a) *P*, jarak dari permukaan Bumi adalah lebih jauh.
*P, the distance from the Earth surface is further.*
(b) (i) Tenaga keupayaan graviti
*Gravitational potential energy*
$= mgh$
$= 3 \times 10 \times 10$
$= 300\ \text{J}$
(ii) Tenaga keupayaan graviti
*Gravitational potential energy*
$= mgh$
$= 3 \times 10 \times 4$
$= 120\ \text{J}$

**5.** Tenaga yang tersimpan di dalam objek kenyal yang dimampat atau diregang
*Energy stored in a compressed or stretched elastic object.*

**6.**



**7.** (a) Mampatan / *Compression*
(b) Regangan / *Stretching*

**8.** (a) 50 N
(b) (i) 10 cm
(ii) 20 cm

(c) Kerja / *Work* = Daya / *Force* × Sesaran / *Displacement*
= 50 N × 0.1 m
= 5 J

(d) Tenaga keupayaan kenyal = $\frac{1}{2}$ Fx
*Elastic potential energy*
= $\frac{1}{2}$ × 50 N × 0.1 m
= 2.5 J

(e) Tenaga keupayaan kenyal = Kerja yang dilakukan untuk meregang / memampatkan spring
*Elastic potential energy = Work done to stretch/ compress spring.*

**9.** (b), (d)

**10.** Jisim objek dan halaju
*The mass of an object and velocity*

**11.** Tenaga kinetik / *Kinetic energy* = $\frac{1}{2}$ mv $^2$
= $\frac{1}{2}$ × 20 kg × $(5)^2$
= 250 J

## PBD 7.3 Prinsip Keabadian Tenaga
*Principle of Conservation of Energy*

**1.** (a), (d)

**2.**

Tenaga keupayaan kepada tenaga kinetik
*Potential energy to kinetic energy*

Tenaga kinetik kepada tenaga keupayaan
*Kinetic energy to potential energy*

**3.** (c) (i) titik *A* / *point A*: Maksimum / *Maximum*
(ii) titik *B* / *point B*: Minimum / *Minimum*
(iii) titik *C* / *point C*: Maksimum / *Maximum*

(d) (i) titik *A* / *point A*: Minimum / *Minimum*
(ii) titik *B* / *point B*: Maksimum / *Maximum*
(iii) titik *C* / *point C*: Minimum / *Minimum*

(e) (i) maksimum / *maximum:* *C* dan *A* */ C and A*
(ii) sifar / *zero*: *B*

(f) (i) maksimum / *maximum:* *B*
(ii) sifar / *zero*: *C* dan *A* */ C and A*

**4.** Prinsip Keabadian Tenaga
*The Principle of Conservation of Energy*
Tenaga kinetik yang diperoleh
= Tenaga keupayaan graviti yang hilang
= 50 J – 20 J
= 30 J
*The kinetic energy possessed*
*= The potential energy that loss*
*= 50 J – 20J*
*= 30 J*

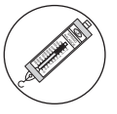
**5.** Tenaga keupayaan graviti maksimum
*Maximum gravitational potential energy*
= Kehilangan tenaga kinetik
*Kinetic energy lost*
= $\frac{1}{2}mp^2$
= $\frac{1}{2}(0.2)(15^2)$
= 22.5 J

## Power PT3
### Bahagian A

**1.** B **2.** B **3.** C **4.** C **5.** D
**6.** A **7.** B **8.** D

### Bahagian B

**1.** (a)



(b)

| | | | |
|---|---|---|---|
| Daya *Force* | ✓ | Isi padu *Volume* | |
| Mass *Jisim* | | Jarak *Distance* | ✓ |

**2.** (a) (i), (iii)

(b)

Tenaga keupayaan kenyal *Elastic potential energy* → Tenaga kinetik *Kinetic energy*

**3.** (a)

Tenaga keupayaan *Potential energy*

- Tenaga keupayaan graviti *Gravitational potential energy*
  - Burung terbang *Bird flies*
  - Batu di lereng bukit *A stone on a hillside*
- Tenaga keupayaan kenyal *Elastic potential energy*
  - Meregang spring *Stretching a spring*
  - Menarik busar *Draw an arc arrow*

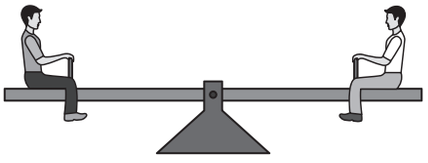
(b) (i), (ii)

### Bahagian C

**4.** (a) (i) Tenaga keupayaan kenyal. Tenaga tersimpan di dalam getah yang diregang
*Elastic potential energy. The energy is stored inside the stretched rubber band.*

(c) (i) Y; Kedudukannya lebih jauh dari permukaan tanah.
*His position is further from the ground.*

(ii) Tenaga telah diabadikan. Tenaga ditukarkan kepada tenaga kinetik.
*Energy has been conserved. Energy is converted to kinetic energy.*

(iii) 

Jarak X dan Y dari permukaan tanah adalah sama.
*The distance of X and Y from the ground is the same.*

## Power KBAT

**1.** Pengawal tersebut memegang senapang yang boleh ditafsirkan sebagai daya. Walau bagaimanapun, pengawal tersebut berdiri tegak tanpa sebarang pergerakan. Oleh itu, nilai sesarannya ialah sifar. Kerja juga adalah sifar.
*The guard holds a gun that can be assumed as force. However, the guard stood upright without any movement. Therefore, the displacement is zero. Work is also zero.*

**2.** Diberi halaju kedua-dua kenderaan adalah sama. Walau bagaimanapun, tenaga kinetik kenderaan *P* adalah lebih tinggi berbanding *Q*. Ini disebabkan oleh jisim kenderaan *P* adalah lebih besar berbanding jisim *Q*.
*Given the velocity of both vehicles is the same. However, the kinetic energy of vehicle P is higher than Q. This is because the mass of vehicle P is greater than the mass of Q.*