Jawapan Praktis Pengukuhan Bab 1

1. (a) Reseptor / *Receptor*
(b) Otak / *Brain*
(c) Efektor / *Effector*

2. (a) Fotoreseptor / *Photoreceptor*
(b) koklea / *cochlea*
(c) bau / *Smell*
(d) sejuk; sakit / *cold; pain*
(e) tunas rasa / *taste bud*

3. (a) Gelemair / Gelemaca / Sklera
Aqueous humour / Vitreous humour / Sclera
(b) Kanta mata
Lens
(c) Retina
Retina
(d) Koroid
Choroid
(e) Saraf optik
Optic nerve

4. Fototropisme, hidrotropisme, geotropisme dan tigmotropisme.
Phototropism, hydrotropism, geotropism and thigmotrpism.

5.

Haiwan *Animal*	**Jenis penglihatan** *Type of vision*	**Bagaimanakah penglihatan itu membantu haiwan ini?** *How the vision helps this animal?*
(a) Harimau *Tiger*	Stereoskopik *Stereoscopic*	Membolehkan harimau menganggar jarak mangsa dengan tepat *Enable the tiger to estimate the distance of its prey accurately*
(b) Rusa *Deer*	Monokular *Monocular*	Membolehkan rusa mengesan kehadiran pemangsa daripada pelbagai arah dan melarikan diri *Enable the deer to detect the presence of its predator from a wide range of direction and escape*

Jawapan Praktis Pengukuhan Bab 2

1. (a)

P	Trakea / *Trachea*	*T*	Diafragma / *Diaphragm*
Q	Bronkiol / *Bronchiole*	*U*	Tulang rusuk / *Ribs*
R	Otot interkosta / *Intercostal muscles*	*V*	Bronkus / *Bronchus*
S	Alveolus / *Alveolus*	*W*	Peparu / *Lungs*

(b) Rongga hidung *Nasal cavity* → *P* → *V* → *Q* → *S*

2.

Keadaan *Situation*	Tarikan nafas *Inhalation*	Hembusan nafas *Exhalation*
(a) Diafragma mengendur *Diaphragm relaxes*		✓
(b) Diafragma mengecut *Diaphragm contracts*	✓	
(c) Sangkar tulang rusuk bergerak ke bawah dan ke dalam *The rib cage moves downwards and inwards*		✓
(d) Sangkar tulang rusuk bergerak ke atas dan ke luar *The rib cage moves upwards and outwards*	✓	
(e) Isi padu rongga toraks bertambah *Volume of thoracic cavity increases*	✓	
(f) Isi padu rongga toraks berkurang *Volume of thoracic cavity decreases*		✓
(g) Tekanan udara dalam rongga toraks lebih rendah daripada tekanan atmosfera *Air pressure in thoracic cavity is lower than atmospheric pressure*	✓	
(h) Tekanan udara dalam rongga toraks lebih tinggi daripada tekanan atmosfera *Air pressure in thoracic cavity is higher than atmospheric pressure*		✓
(i) Udara ditolak keluar dari peparu *Air is forced out of the lungs*		✓
(j) Udara disedut ke dalam peparu *Air is sucked into the lungs*	✓	

3. *P*: Alveolus / *Alveolus*
Q: Bronkiol / *Bronchiole*
R: Kapilari darah / *Blood capillaries*

4. (a) Mengurangkan bekalan oksigen di dalam badan
Reduces the supplies of oxygen in the body
(b) Merangsang pertumbuhan sel-sel kanser
Stimulates the growth of cancer cells

5. (a) Peparu / *Lungs*
(b) Insang / *Gills*
(c) Peparu / *Lungs*
(d) Kulit luar lembap / *Moist outer skin*
(e) Peparu / *Lungs*
(f) Sistem trakea / *Trachea system*

6. (a) Kadar pernafasan dan denyutan jantung bertambah
Rate of breathing and heartbeat increases
(b) Bawa tangki oksigen semasa menyelam
Carry oxygen tank when diving
(c) Bernafas laju / *Breathe rapidly*

7. (a) (i) Sel pengawal / *Guard cell*
(ii) Stoma / *Stoma*
(b) *X*: Oksigen / *Oxygen*
Y: Karbon dioksida / Carbon dioxide

Jawapan Praktis Pengukuhan Bab 3

1. (a) Arteri pulmonari / *Pulmonary artery*
(b) Vena kava / *Vena cava*
(c) Atrium kanan / *Right atrium*
(d) Injap trikuspid / *Tricuspid valve*
(e) Ventrikel kanan / *Right ventricle*
(f) Aorta / *Aorta*
(g) Vena pulmonari / *Pulmonary vein*
(h) Atrium kiri / *Left atrium*
(i) Injap bikuspid / *Bicuspid valve*
(j) Injap sabit / *Semilunar valve*
(k) Ventrikel kiri / *Left ventricle*

2.

Jenis salur darah *Type of blood vessel*	**Ciri-ciri** *Characteristics*		
	Ketebalan dinding *Thickness of wall*	**Saiz lumen** *Size of lumen*	**Kehadiran injap** *Presence of valves*
Vena *Vein*	Nipis *Thin*	Besar *Big*	Ya *Yes*
Kapilari *Capillary*	Setebal satu sel *One-cell thick*	Sangat kecil *Very small*	Tidak *No*
Arteri *Artery*	Tebal *Thick*	Kecil *Small*	Tidak *No*

3.

(a) Kapilari *Capillary*	Mengangkut darah ke dalam jantung *Transports blood into the heart*
(b) Vena *Vein*	Mengangkut darah keluar dari jantung *Transports blood out from the heart*
(c) Arteri *Artery*	Menghubungkan arteri dengan vena *Connects the arteries to the veins*

4. Peredaran pulmonari mengangkut darah antara jantung dengan peparu. Peredaran sistemik mengangkut darah antara jantung dengan bahagian badan yang lain.

Pulmonary circulation transports blood between the heart *and the* lungs*. Systemic circulation transports blood between the* heart *and* all other parts of the body*.*

5. (a) *P*: Plasma / *Plasma*
Q: Sel darah putih dan platelet / *White blood cells and platelets*
R: Sel darah merah / *Red blood cells*

(b) Emparan / *centrifuge*

6.

Penderma / ***Donor*** / **Penerima** / ***Recipient***	A	B	O	AB
A	✓		✓	
B		✓	✓	
O			✓	
AB	✓	✓	✓	✓

7.

Situasi *Situation*	**Kadar transpirasi (Tinggi atau Rendah)** *Rate of transpiration (Low or high)*
(a) Berangin / *Windy*	Tinggi / *High*
(b) Cuaca panas / *Hot weather*	Tinggi / *High*
(c) Udara lembap / *Humid air*	Rendah / *Low*
(d) Cahaya malap / *Dim light*	Rendah / *Low*

8. (a) *P*: Berkas vaskular / *Vascular bundle*
Q: Xilem / *Xylem*
R: Floem / *Phloem*

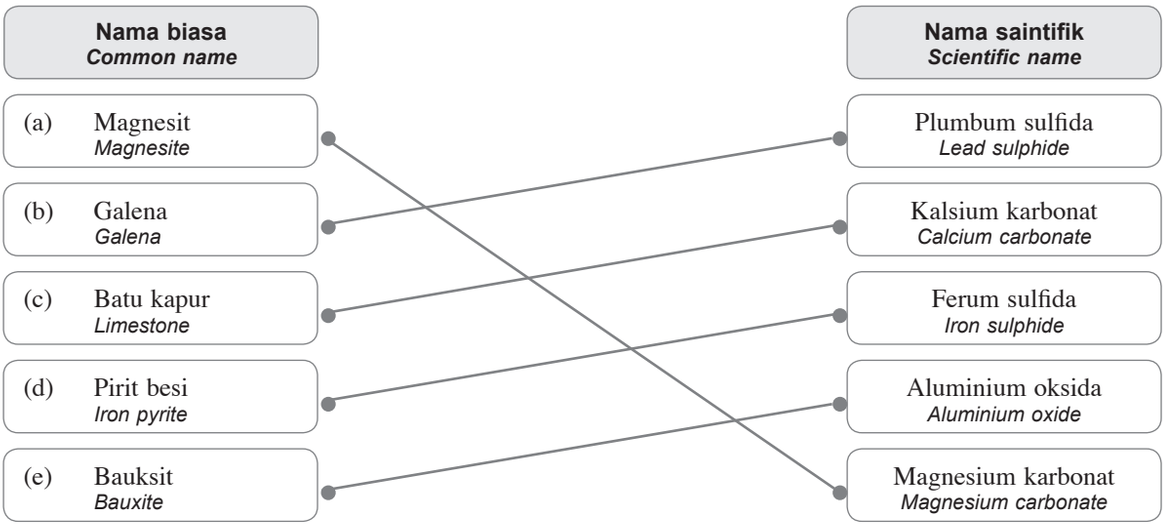
(b) Q : Mengangkut air dan mineral dari akar ke daun
Transport water and minerals from the roots to the leaves
R: Mengangkut makanan dari daun ke seluruh bahagian pokok
Transport food from the leaves to all parts of the plant

Jawapan Praktis Pengukuhan Bab 4

1. unsur / *element*
sebatian / *compound*

2. semula jadi / *naturally*
satu; lebih / *one; more*

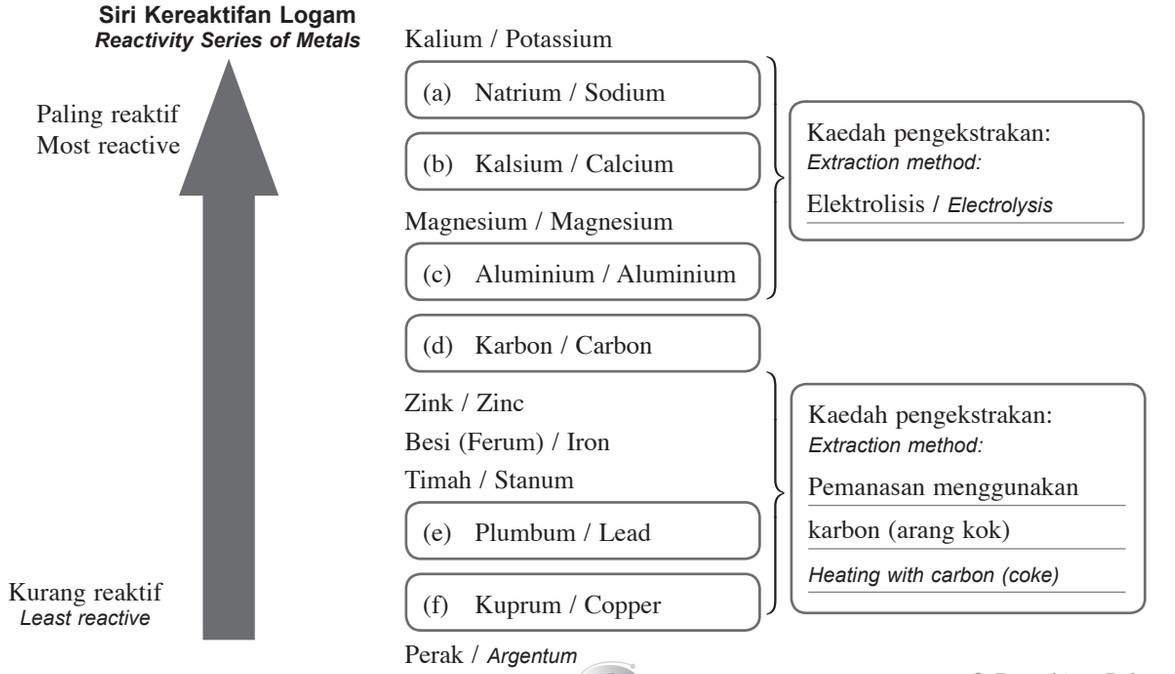
3.



4. (a) Silikon, oksigen / *Silicon, oxygen*
(b) Emas / *Gold*
(c) Membuat barangan perhiasan / *Making jewelleries*
(d) Kalsium, karbon, oksigen / *Calcium, carbon, oxygen*
(e) Membuat rangka bangunan, landasan kereta api / *Making building frame, railway track*
(f) Aluminium, silikon, oksigen / *Aluminium, silicon, oxygen*

5. (a) Kadar tindak balas sesuatu logam / *The rate of reaction of a metal*
(b) (i) Magnesium / *Magnesium*
(ii) Kuprum / *Copper*
(c) (i) Kuprum / *Copper*
(ii) Besi / *Iron*
(iii) Zink / *Zinc*
(iv) Magnesium / *Magnesium*

6.



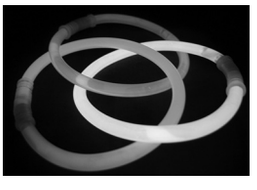
1. (a) Termokimia / *Thermochemistry*
(b) eksotermik / *exothermic*
(c) endotermik / *endothermic*

2. Tindak balas endotermik / *Endothermic reaction*

3.

Proses *Process*	**Jenis tindak balas** *Type of reaction*
(a) Pembentukan salji *Formation of snow*	Eksotermik *Exothermic*
(b) Pendidihan air *Boiling of water*	Endotermik *Endothermic*
(c) Fotosintesis *Photosynthesis*	
(d) Respirasi *Respiration*	
(e) Penyejatan air *Evaporation of water*	

4.

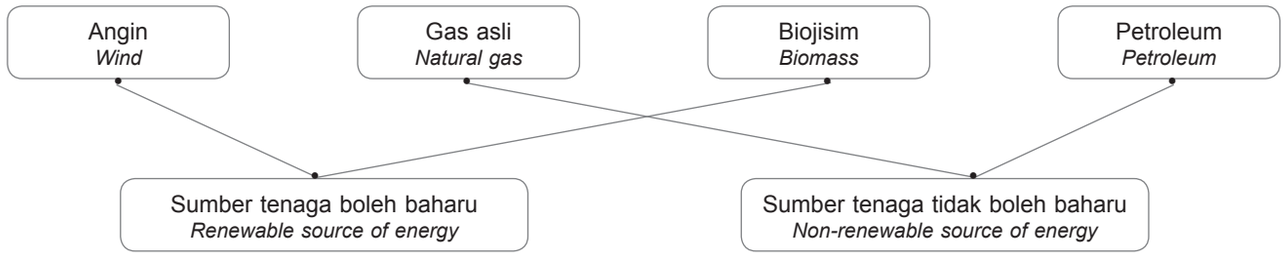
(a)  ✓

(b)  ☐

(c)  ✓

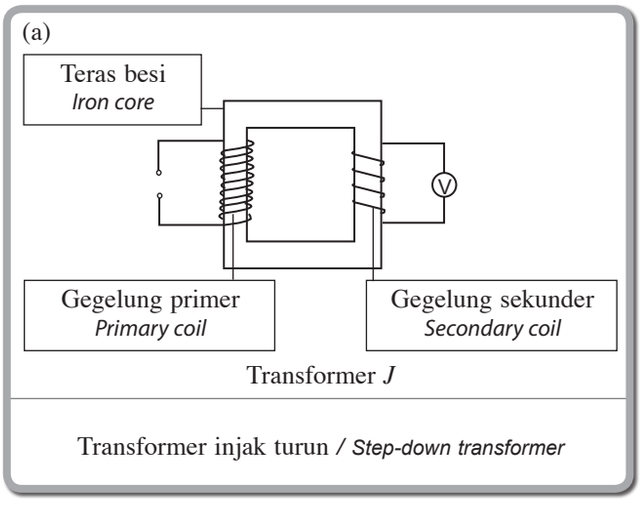
Jawapan Praktis Pengukuhan Bab 6

1.



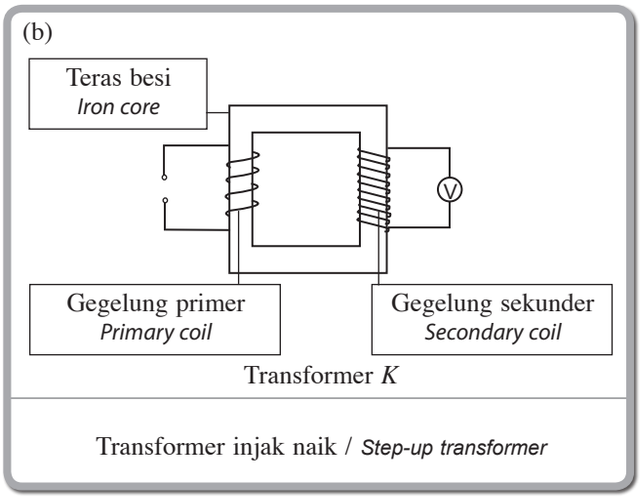
2. (a) Penjana turbin gas / *Gas turbine generator*
(b) Penjana hidroelektrik / *Hydroelectric generator*
(c) Penjana nuclear / *Nuclear generator*
(d) Penjana diesel / *Diesel generator*

3.



Transformer *J*

Transformer injak turun / *Step-down transformer*



Transformer *K*

Transformer injak naik / *Step-up transformer*

4. (a) *P*: Dawai bumi / *Earth wire*
Q: Dawai neutral / *Neutral wire*
R: Fius / *Fuse*
S: Dawai hidup / *Live wire*

(b) (i) *Q*
(ii) *S*
(iii) *R*

5.

Alat elektrik *Electrical appliance*	**Seterika** *Iron*	**Televisyen** *Television*	**Pencuci vakum** *Vacuum cleaner*	**Penyaman udara** *Air conditioner*
Kuasa (W) *Power (W)*	1000	200	1100	1500
Arus elektrik (A) *Electric current (W)*	$\frac{1000}{240} = 4.2$ A	$\frac{200}{240} = 0.8$ A	$\frac{1100}{240} = 4.5$ A	$\frac{1500}{240} = 6.3$ A
Nlai fius yang sesuai *Suitable fuse rating*	5 A	1 A	3 A	10 A

6. Mentol tidak menyala.
The bulb does not light up.

Jawapan Praktis Pengukuhan Bab 7

1.

Istilah *Term*	Definisi *Definition*
(a) Tenaga keupayaan graviti *Gravitational potential energy*	Tenaga yang dimiliki oleh suatu objek yang bergerak *Energy possess by a moving object*
(b) Kerja *Work*	Tenaga yang dimiliki oleh suatu objek apabila dimampatkan atau diregang. *Energy stored by an object when it is stretched or compressed.*
(c) Tenaga keupayaan kenyal *Elastic potential energy*	Tenaga yang dipunyai oleh suatu objek disebabkan oleh kedudukannya. *Energy possessed by an object due to its position*
(d) Kuasa *Power*	Hasil darab daya dengan sesaran *Product of the force and the displacement*
(e) Tenaga kinetik *Kinetic energy*	Kadar kerja yang dilakukan *Rate of work done*

2. (a) Tenaga keupayaan graviti / *Gravitational potential energy*
(b) Tenaga keupayaan kenyal / *Elastic potential energy*
(c) Tenaga kinetik / *Kinetic energy*
(d) Tenaga keupayaan graviti / *Gravitational potential energy*

3. (a) Benar / *True*
(b) Benar / *True*
(c) Palsu / *False*
(d) Benar / *True*
(e) Palsu / *False*

4. (a) Kerja = Daya × Sesaran / *Force × Displacement*
Work = 20 × 3
= 60 J

(b) *Kuasa* / *Power* $= \frac{\text{Kerja}}{\text{Masa}} \div \frac{\textit{Work}}{\textit{Time}}$
$= \frac{500 \times 30 \times 16}{10 \times 100}$
= 240 W

(c) Tenaga keupayaan graviti = mgh
Gravitational potential energy $= \frac{1.5 \text{ kg} \times 10 \times 75 \text{ cm}}{100}$
= 11.25 J

(d) Daya (N) = jisim (kg) × pecutan (m/s^2)
Force (N) = *mass* (kg) × *acceleration* (m/s^2)
= 0.5 kg × 10 m/s^2
= 5 N

5. Prinsip Keabadian Tenaga menyatakan bahawa tenaga tidak boleh dicipta dan dimusnahkan tetapi boleh berubah daripada satu bentuk kepada bentuk lain. Jumlah tenaga sebelum perubahan adalah sama dengan jumlah tenaga selepas perubahan.

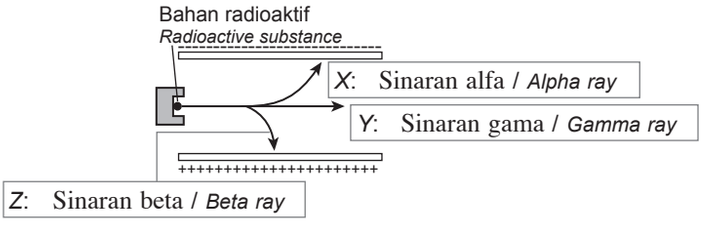
Principle of Conservation of Energy states that energy can neither be creaated nor destroyed but it can change from one form to another. The amount of energy before the changes is equal to the amount of energy after the changes.

1. (a) hilang / *loses*
(b) menerima / *gains*

2.

Sinaran / Sumber sinaran *Radiation / Source of radiation*	Sinaran mengion *Ionising radiation*	Sinaran tidak mengion *Non-ionising radiation*
(a) Gelombang mikro *Micro wave*		✓
(b) Radon *Radon*	✓	
(c) Sinaran kosmik *Cosmic rays*	✓	
(d) Gelombang radio *Radio waves*		✓
(e) Sinar suria *Solar radiation*	✓	

3. (a)



(b) *X*: Sinaran alfa / *Alpha ray*
Y: Sinaran beta / *Beta ray*
Z: Sinaran gama / *Gamma ray*

4. Kerana sinaran radioaktif tidak boleh menembusi dinding plumbum
Because radioactive radiation cannot penetrate through a thick lead wall

5. Sisa radioaktif disimpan di dalam bekas berdinding tebal yang diperbuat daripada plumbum atau konkrit. Bekas ini kemudiannya ditimbus di dalam lombong yang tidak digunakan atau tempat yang tidak didiami manusia.
Radioactive waste is stored in a container with a thick wall made from lead metal or concrete. The container is then buried in an unused mine or a place inhabited by human

Jawapan Praktis Pengukuhan Bab 9

1. (a) ✓
(b) ✗
(c) ✓
(d) ✗

2. (a) Lapisan luar / *Outer layer*
(b) Zon radiasi / *Radiation zone*
(c) Zon perolakan / *Convection zone*
(d) Kromosfera / *Chromosphere*
(e) Korona / *Corona*

3. (a) Lapisan (teras / fotosfera) Matahari menjanakan tenaga.
(Core / Photosphere) layer of the Sun generates energy.

(b) Gas (helium / hidrogen) terbentuk semasa pelakuran nukleus.
(Helium / Hydrogen) gas is formed during nuclear fusion.

(c) Lapisan (fotosfera / kromosfera) sentiasa kelihatan bercahaya dilihat daripada Bumi.
(Photosphere / Chromosphere) layer always seem shiny from the Earth.

4.

(a) Tompok hitam pada permukaan Matahari *Dark spots on the surface of the Sun*	Semarak suria *Prominences*
(b) Letupan gas hidrogen yang besar *Large explosions of hydrogen gas*	Tompok Matahari *Sunspots*
(c) Nyalaan besar daripada fotosfera *Giant flames from the photosphere*	Nyalaan suria *Solar flares*

5. (a) Lapisan magnetosfera / *Magnetosphere layer*
(b) (i) Fenomena aurora / *Aurora phenomenon*
(ii) Gangguan pada sistem telekomunikasi / *Disruption to the telecommunication system*

Jawapan Praktis Pengukuhan Bab 10

1. (a) Edwin Powell Hubble
(b) Isaac Newton
(c) Galileo Galilei
(d) Hans Lippershey

2. (a) (i) Stesen angkasa / *Space station*
(ii) Kuar angkasa / *Space probe*
(iii) Teleskop radio / *Radio telescope*
(iv) Kapal angkasa ulang-alik / *Space shuttle*

(b) (i) Roket / *Rocket*
(ii) Kuar angkasa / *Space probe*
(iii) Kapal angkasa ulang-alik / *Space shuttle*
(iv) Stesen angkasa / *Space station*
(v) Satelit / *Satellite*

3. (a) Pemancar; memancarkan; penerima; tempat lain
transmitter; emit; receiver; other place
(b) Satelit komunikasi / *Communication satellite*
(c) (i) Pandu arah dan penentu kedudukan / *Navigation and positioning*
(ii) Penderiaan jauh / *Remote sensing*

4. (a) ✓
(b) ✓
(c) ✓