

### Physics General Level 2004


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1. B
2. E
3. C
4. B
5. C
6. (a) (i) electrical to sound  
(ii) sound to electrical  
(b) **An electrical signal** is transmitted along the wire at a speed **greater than** the speed of sound.
7. (a) Light travels **faster** than sound.  
(b) (i) The speed of sound (in air)  
(ii) Reaction time is not negligible.

8. (a) (i) 0.25 ampere  
(ii) 4 volts

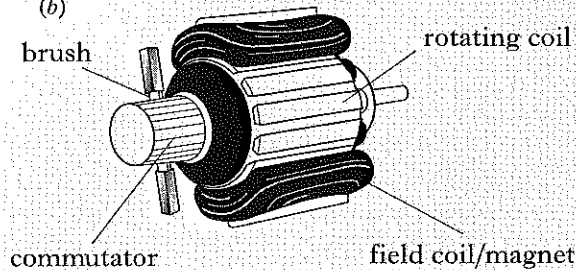
(b) The speed of the motor increases because the current (in the circuit) increases.

(c) Any suitable use

9. (a) (i) 

(ii) the earth (wire)

(b)



10. (a) The camping light is off when the switch is in position Q.

(b) The operating voltage of the filament lamp is 12 volts.

(c) (i) The useful energy transformation in the filament lamp takes place in the **wire**.

(ii) The useful energy transformation in the discharge tube takes place in the **gas**.

(iii) The electrical energy transformed each second by the discharge tube is **the same** as the electrical energy transformed each second by the filament lamp.

(iv) The heat energy produced each second by the discharge tube is **smaller than** the heat energy produced each second by the filament lamp.

11. (a) Any **stated** value below 20 hertz. (For example, 10 hertz).

(b) 20 000 hertz

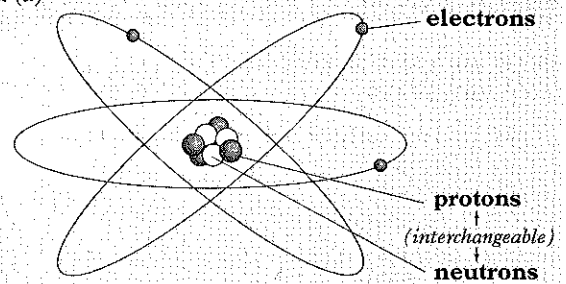
(c) decibel/dB

(d) 68 metres

(e) Any suitable example. For example, one of:

- Sterilisation
- Checking for/breaking kidney stones
- Viewing unborn baby
- Healing muscle damage
- Breaking up blood clots
- Viewing the heart
- Viewing blood flow
- Checking for cancer or cysts
- Killing bacteria

12. (a)



(b) (i) The radiation that has the greatest range is **gamma**.

(ii) The radiation that is absorbed by a sheet of paper is **alpha**.

(iii) Dose equivalent is measured in **sieverts**.

(c) Any two suitable. For example, wear a mask and gloves.

13. (a) (i) 1200 ohms

(ii) (A) the resistance decreases

(B) the current increases

(b) Any two from:

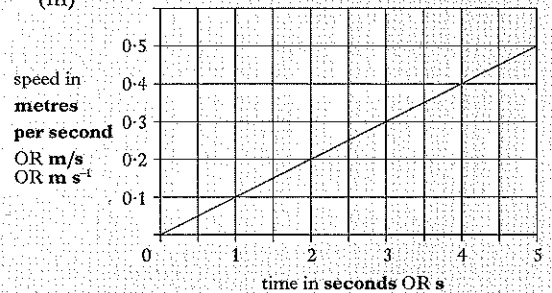
- Glass Y is thicker (than the other two).
- The glasses are not all of equal thickness.
- Light meter for glass Z is closer (to the source of light).
- Not all source-meter distances are equal.
- Glasses are different distances away from the light source.

14. (a) (i) speed at PQ =  $\frac{\text{length of card}}{\text{reading on timer}}$   
=  $\frac{0.1}{0.2}$

= 0.5 (metre per second)

(ii) 0.1 metre per second per second

(iii)



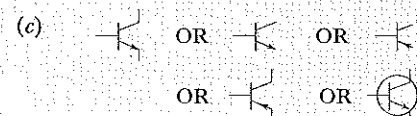
(b) (i) the speed of the trolley at the light gate is **less**

(ii) the acceleration of the trolley down the slope is **the same**.

15. (a) **Input** → **Process** → **Output**

(b) (i) thermistor

(ii) loudspeaker



**Physics General Level 2004 cont.**

16. (a) (i) 160 (kilowatt-hours)  
 (ii) £14.40

(b) (i) Any suitable. For example, one of:

- wood
- tidal
- geothermal
- solar
- hydro
- biomass
- wave

(ii) Any suitable. For example, one of:

- nuclear
- any **named** fossil fuel
- peat

17. (a) Transformer – to change (the magnitude of) the **voltage**.

(b) Lower current **or** less energy loss **or** less  $PR$  loss.

(c) 25 000 volts

(d) 5.28

18. (a) 10 High Street  
 Glentown  
 Scotland  
**Earth**  
**Solar System**  
**Milky Way**  
 Universe

(b) (i) Any one from:

- planet
- moon
- Jupiter
- Earth
- Ganymede

(ii) Any one from:

- star
- Sun
- Sirius

(iii) Sirius/dog star

(iv)

