


# Pocket answer section for SQA Credit Physics 2004 – 2008

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## Physics Credit Level 2004

1. (a) (i) 900 MHz  
(ii) 0.2 m
- (b) (i) Any two from:
- Less amplification needed
  - More signals (per fibre)
  - Less energy loss
  - Fewer repeater stations
  - No (electrical) interference
  - Better quality
  - Cost
  - Security
  - Smaller
- (ii) (A)  $2.0 \times 10^6$  m/s  
(B)  $2.4 \times 10^9$  m
2. (a) 1500 images
- (b) separate the signal from the carrier.
- (c) (i) The three primary colours are needed to produce all the colours seen.  
(ii) Mask stops beams overlapping so that each beam hits the correct colour.
3. (a) To store/supply energy
- (b) (i) Total distance moved by force  
 $= 500 \times 400 \times 10^{-3} = 200$  m  
 $WD = F \times d = 9.0 \times 200 = 1800$  J  
 (ii) (A) 1620 J  
(B) 2160 s
4. (a) Sidelights
- (b) With S2 open: relay coil is de-energised, causing the relay switch to open, the headlight circuit is broken. The sidelights are not controlled by the relay so they stay on.
- (c) (i) 2 A  
(ii) 1200 C  
(iii) Headlight is a higher power rating than the sidelight, so more energy is transformed each second.
5. (a) (i) 400  
(ii)  $8 \Omega$
- (b) When the push-switch is pressed, the electromagnet is energised. The iron bar is attracted inside the electromagnet freeing the door.
6. (a) Can **only** see distant objects clearly OR Cannot see close objects clearly
- (b) Left Right
- 
- (c) 0.4 m

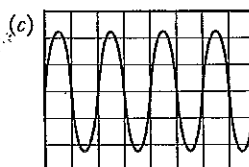
7. (a) (i) Gain/loss of charge/electrons from an atom.  
(ii) electrons/charged particles move (to form a current)
- (b) Alpha radiation causes more ionisation
- (c) becquerel or Bq
8. (a) NOT gate (or inverter)

(b)

Liquid Level	P	Q	R
Overfilled	0	1	0
Acceptable	1	0	0
Underfilled	1	0	1

- (c) OR gate
9. (a) Average speed – the time is measured over a long distance.
- (b) 9.09 s
- (c) (i) Air resistance/friction/drag is increased  
(ii) 16 500 m  
(iii)  $-1.47$  m/s<sup>2</sup>  
(iv) 4400 N  
(v)  $7.26 \times 10^7$  J
10. (a) (i) The wire is moving in a magnetic field.  
(ii) Any one from:
- Stronger magnet
  - Pluck harder
  - Pluck more at right angles to the field
  - Make the wire tighter

(b) 0.4 mV



11. (a)  $20^\circ\text{C}$
- (b) (i) Substance is changing state  
(ii) 5100 J  
(iii) 10 200 J/kg
12. (a) (i) W and X  
(ii) Any two from:  
reduce C, reduce R, increase V.
- (b)  $80 \Omega$
13. (a) Light
- (b) Different telescopes are needed to detect different types of radiation
- (c) At the focal point
- (d) Arecibo, because it is a radio telescope and has the largest diameter reflector.

## Physics Credit Level 2004 (cont.)

14. (a) 1 500 000 N

- (b) 1. Mass of the vehicle is reduced.  
2. Gravitational field strength is less.
- (c) Constant speed in a straight line, because no (unbalanced) forces act on it.

15. (a)

TV & Radio	microwave	Infrared	Visible light	ultraviolet	X-rays	Gamma rays
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(b) Any one from: TV/radio, microwave, infrared

(c) Photographic film

(d) Any one from: Thermographic images, repair muscle tissue, detecting tumours, measuring blood pressure, measuring temperature, sealing blood vessels