Physics General Level 2003

1. C

2. A

3. C

4. B

5. D

6. E

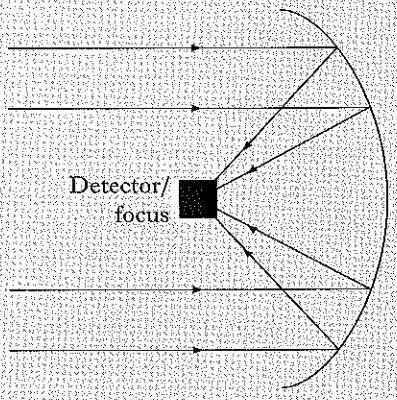
7. (*a*) Amplifier/Amp

(*b*) To increase the amplitude (of the signal)(from the decoder)

(*c*) To provide (extra) energy/power needed (by the amplifier)

8. (*a*) 3×10^8 m/s

(*b*) The curved dish collects more of the signal and focuses it (at the detector)



(*c*)
- geostationary
- 24 hours or 1440 minutes or 1 day
- ground station/earth station/receiving station/satellite dish/curved dish/dish aerial
- cable/wire/optical (fibre)/microwave/radio

9. (*a*) Lasts 10 times as long/more efficient/cheaper to run/lasts longer

(*b*) Annual saving = £9·60

(*c*) 20 W lamp produces same light as 100 W conventional lamp (therefore less energy 'wasted' [as heat])
or
Same light energy for 20p with energy saving compared to £1.00 with conventional (so same light for 1/5 cost)

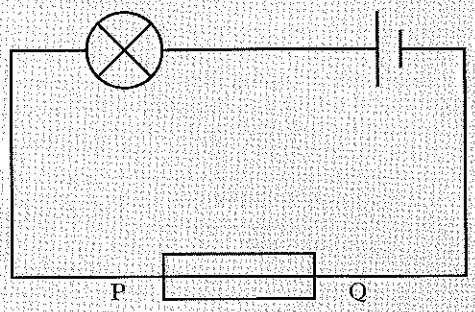
(*d*) (i) (metal) filament **or** (coil of) wire
(ii) gas

10. (*a*) R = 440 ohms

(*b*) 400 (ohms)

(*c*) (i) More significant figures in the meter readings/more decimal places
(ii) Use the "ohms" scale/setting

11. (*a*)



(*b*) Connect P to Q, check lamp lights, (re)place fuse (between P & Q), lamp does not light

12. (*a*) To measure temperature

(*b*) Any **two** from:
- Clinical thermometer has a smaller range
- Clinical thermometer is more accurate/reads to more (significant) figures/decimal places/more sensitive/narrower column
- Clinical thermometer can maintain reading/temperature
- Clinical thermometer has a kink/constriction/button to reset

13. (*a*) Laser can (cut through tissue and) seal blood vessels (immediately)

(*b*)

(*c*) Light (energy) to heat (energy)

(*d*) Blue, green, red

(*e*) Image (broken) bones/treat cancer **or** tumours/image (soft) tissue/obtain a 3-D image (in a CAT scanner)

14. (*a*) (i) LDR
(ii) Thermistor
(iii) Microphone

(*b*) (i) Any **two** from:
- Lamp
- LED
- 7-segment display

(ii) Any **two** from:
- Loudspeaker
- relay
- solenoid
- (electric) meter

15. (*a*) shape
speed/velocity
direction (of movement)

(*b*) 45 m/s²

16. (*a*) (i) 1·2 N
(ii) 30 J

(*b*) (i) 16 J
(ii) 46 J
(iii) 9·2 W

17. Conduction: any **one** from:
- double glazing
- carpets
- cavity walls
- (under) floor insulation
- loft insulation
- wall insulation

Convection: any **one** from:
- (cavity) wall insulation
- loft insulation
- radiators under windows
- under floor insulation
- draught excluders
- better fitting doors and/or windows

Radiation: any **one** from:
- (closed) curtains
- foil backed plasterboard
- foil behind radiators
- double glazing

18. (*a*) $E_h = 94\,500$ J

(*b*) (i) (latent heat supplied to) change state/break bonds of solid/latent heat
(ii) remains constant

19. (*a*) A large non-luminous satellite of a star **or** an object that orbits a star **or** an object that orbits the Sun

(*b*) $a = 12$ m/s²

(*c*) When there are no external **or** unbalanced forces the motion will not change.

(*d*) Different from its weight on Earth