



Oxford Cambridge and RSA Examinations
General Certificate of Secondary Education

SCIENCE: DOUBLE AWARD A **Paper 5**
PHYSICS **Paper 1**

1983/5
1982/1

FOUNDATION TIER

MARK SCHEME

Specimen Paper 2003

| Qn | Expected answer | Marks | Additional guidance |
|-------|--|----------------------|--|
| 1 a i | infra red / microwaves | 1 | Allow IR |
| ii | ultra violet | 1 | Allow UV |
| iii | X-rays | 1 | Allow gamma / right hand side |
| b | infra red (1) visible light (1) ultra violet (1) | 3 | |
| c | tracers (1) to test flow (1) killing / treating / cure (1) cancer / tumour unwanted cells (1) sterilising (1) medical equipment (1) | 2 | Allow any other known use helping cancer = 0 sterilising non-medical equipment = 0 radiotherapy = 1 |
| d i | passes through flesh / skin (1) absorbed / stopped by bone (1) indication of change on film (1) any two QWC = 1 <i>This mark should only be awarded if the answer given by the candidate attempts to address the question and the quality of the description makes the meaning clear</i> | 2 1 | Not reflects from base |
| ii | shielding (e.g. lead apron) / leave room / wear film badge (owtte) (1) | 1 | Minimum density of shielding - iron |
| e i | damage to cells (1) ionisation of cells (1) can cause cancer / tumour (1) any two | 2 | |
| ii | gamma (1) | 1 (15) | Or uv |

| Qn | Expected answer | Marks | Additional guidance |
|--------------|--|---|--|
| 2 a i | live (1) neutral (1) earth (1) (any order) | 3 | |
| ii | brown | 1 | |
| iii | break circuit / blows / melts (1) if too much <u>current</u> (1) | 2 | Reject blows up Reject too powerful Reject too much electricity Allow too many amps |
| b i | $2 \times 6/60 / 2 \times 0.1$ (1) 0.2 (1) | 2 | |
| ii | 2 | 1 | Allow ecf if $10 \times b\ i$ |
| c | implied separate casings (1) insulation between them (1) no earth wire / owtte (1) any two QWC = 1 <i>This mark should only be awarded if the answer given by the candidate attempts to address the question and the quality of the description makes the meaning clear.</i> | 2 1 (12) | Reject two layers of insulation Allow insulating case |

| | | | |
|------------|--|---|---|
| 3 a | straight ray from crown reflecting at surface to Queen's eye (1) angles equal (1) arrow(s) in correct direction (1) | 3 | Check straightness of ray by eye only Range for point of incidence defined At least one arrow |
| b i | ray continued to surface (1) joined to King's eye (1) | 2 | |
| ii | refracts / changes direction / bends (1) <u>speeds up</u> (1) goes into <u>less dense</u> material (1) any two . | 2 (7) | |

| Qn | Expected answer | Marks | Additional guidance |
|-------------|---|------------|--|
| 7 a | cosmic rays / Sun (1) rocks / granite (1) power stations (1) radon (1) fallout / nuclear accidents (1) nuclear weapons testing / atomic bombs (1) any two | 2 | Reject building materials Do not allow irradiated food or similar Accept nuclear waste |
| b | distance / use tongs (1) suitable reference to shielding (1) short time of exposure (1) minimum source strength (1) pupils not to handle source (1) direction of pointing source (1) any two | 2 | Lead apron should be thick or dense Reject other protective clothing |
| c | 120 60 30 15 0 0 | 1 | Any 5 correct |
| d i | five points correctly plotted / ecf | 1 | Points to be within $\frac{1}{2}$ square Points to be visible |
| ii | single line smooth curve of best fit | 1 | |
| e i | beta radiation will not pass through / stopped by 20 mm thick sheet / sheet too thick / owtte | 1 | |
| e ii | gamma / X-rays | 1 | |
| | | (9) | |

| | | | |
|--------------|--|------------|---|
| 8 a i | clean / non-polluting / free energy / saves fossil fuels / renewable / qualified reference to cost | 1 | Reject environmentally friendly Reject cheaper Reject cheaper source of electricity |
| ii | so lots of sunshine hits it | 1 | |
| iii | Sun does not always shine | 1 | Allow expensive installation cost |
| b | 5000/20000 (1) 0.25 / 25% (1) | 2 | |
| | | (5) | |

| Qn | Expected answer | Marks | Additional guidance |
|---------------|--|-------------------------------------|---|
| 9 a | 15 | 1 | |
| b | 55± 1 | 1 | |
| c | 36 53 / ecf 73 / ecf 96 | 1 | All correct |
| d | road surface / wet or dry (1) load (1) tyre condition (1) brake condition / type of brakes / abs (1) reaction time affected by drugs / alcohol / tired (1) any two | 2 (5) | |
| 10 a i | tick in second box | 1 | |
| ii | like / similar / same (1) charge (1) | 2 | |
| b i | attraction / touch / hit | 1 | |
| ii | unlike charges / one positive and one negative | 1 (5) | |
| 11 a | idea of electromagnet/iron magnetised by the current (1) attracts <u>iron bar</u> (1) | 1 1 | Emphasis on <u>electromagnetism</u> REJECT 'current through iron REJECT 'attract hammer' |
| b | Circuit breaks/current stops (1) Iron demagnetised/electromagnet stops working (1) Spring pulls back (1) | 3 (5) | |
| 12 a | Speed = distance / time (1) 1500 (1) | 2 | |
| b | Shorter / less (1) Less distance / fish near (1) | 2 (4) | Accept: faster / quicker |

