

Name of the Student: _____

Max. Marks : 18 Marks

Time : 18 Minutes

Mark Schemes

Q1.

- | | | |
|-----|--|------------|
| (a) | R | 1 |
| (b) | they have the same wave speed as visible light | 1 |
| | they have a lower frequency than gamma rays | 1 |
| (c) | any two from: | |
| | • ageing of the skin
<i>allow sunburn</i>
<i>burn unqualified is insufficient</i> | |
| | • skin cancer
<i>cancer is insufficient</i>
<i>allow mutation of genes in skin cells</i> | |
| | • eye damage
<i>allow blindness</i> | 2 |
| (d) | any two from: | |
| | • gamma (rays) | |
| | • X-rays | |
| | • ultraviolet | 2 |
| | | [7] |

Q2.

- | | | |
|-----|---|---|
| (a) | light | 1 |
| | ionising | 1 |
| (b) | x-rays have a longer wavelength and a lower frequency | 1 |
| (c) | $\frac{0.039 + 0.035 + 0.040}{3}$ | 1 |
| | = 0.038 (millisieverts) | |

an answer of 0.038 scores 2 marks

1

- (d) the dose decreases if you stand further from the machine

1

(e) $\frac{0.180}{0.012}$

1

= 15 days

an answer of 15 days scores 2 marks

1

- (f) the benefit (of a correct diagnosis) outweighs the risk
allow the (increased) risk of cancer is very small for an x-ray
allow for medical imaging, eg to see broken bones

1

(g) $20 \times \frac{40}{100}$

allow 20 x 40%

1

= 8 (millisieverts)

an answer of 8 (millisieverts) scores 2 marks

1

[11]