

Mark schemes

Q1.

(a) any **three** from:

- they travel at the same speed (in a vacuum / air)
allow they travel at the speed of light
- they can travel through a vacuum
allow they do not need a medium (to travel)
- they are transverse (waves)
- they are electromagnetic (waves)
ignore they can be reflected / refracted / absorbed / transmitted / diffracted.

3

(b) any **one** from:

- (medical) imaging
allow correctly named method eg PET scan, tracer, gamma camera
do not accept ultrasound, CT scan, X-rays, MRI scan
- (medical) treatments
allow correctly named treatment eg radiotherapy, brachytherapy, gamma knife
do not accept chemotherapy
allow sterilising medical equipment

1

(c) gamma rays are (weakly) ionising but radio waves are not (ionising)

1

(so gamma rays) can cause mutations in genes / DNA

or

(so gamma rays) can increase the risk of cancers

*allow can cause cancer**allow damages / kills cells*

1

(d) (radio waves are produced by) oscillations in electrical circuits (of the scanner)

*allow (radio waves are produced by) alternating current**allow (radio waves are produced by) oscillating electrons (in an aerial)*

1

the radio waves have the same frequency as the oscillations

MP2 dependent on MP1

1

[8]