

**M1. The mark scheme gives some guidance as to what statements are expected to be seen in a 1 or 2 mark (L1), 3 or 4 mark (L2) and 5 or 6 mark (L3) answer. Guidance provided in section 3.10 of the 'Mark Scheme Instructions' document should be used to assist in marking this question.**

Mark	Criteria	QoWC
6	<p>All three aspects covered:</p> <p>An comparison of patient safety in terms of ionising radiation exposure.</p> <p>An appreciation of convenience in terms of pre treatment, scan time, patient movement and discomfort.</p> <p>There may also be a discussion of comparative cost and equipment portability.</p> <p>A discussion of the types of information available in terms of uses and limitations.</p>	<p>The student presents relevant information coherently, employing structure, style and sp&amp;g to render meaning clear. The text is legible.</p>
5	<p>Two of the three aspects fully covered, with some detail missing from the third.</p>	
4	<p>One aspect fully covered, with some detail missing from the other two</p> <p>Or</p> <p>Two aspects fully covered, with little or no relevant information about the third.</p>	<p>The student presents relevant information and in a way which assists the communication of meaning. The text is legible. Sp&amp;g are sufficiently accurate not to obscure meaning.</p>
3	<p>All three aspects partially covered, with some detail missing from each</p> <p>Or</p>	

	One aspect fully covered, with little or no relevant information about the other two	
2	Two aspects partially covered, with little or no relevant information about the third.	The student presents some relevant information in a simple form. The text is usually legible. Sp&g allow meaning to be derived although errors are sometimes obstructive.
1	One aspect partially covered, with little or no relevant information about the other two.	
0	Little or no relevant information about any of the three aspects.	The student's presentation, spelling punctuation and grammar seriously obstruct understanding.

*The following comparisons are likely to be present:*

		<i>PET</i>	<i>u / s</i>
<i>Patient Safety</i>	<i>Ionising radiation exposure</i>	<i>Mod to high</i>	<i>None (no tracer)</i>
<i>Convenience</i>	<i>Scan time</i>	<i>2-4 h</i>	<i>10 -15 min</i>
	<i>equipment</i>	<i>Large, bulky</i>	<i>portable</i>
	<i>cost</i>	<i>expensive</i>	<i>relatively cheap</i>
	<i>Pre-treatment</i>	<i>Needs tracer injection</i>	<i>No injection</i>
	<i>Patient movement</i>	<i>Must lie still</i>	<i>Movement tolerated</i>
	<i>discomfort</i>	<i>Not good if claustrophobic</i>	<i>Requires cold gel</i>
<i>Information</i>		<i>Chemical</i>	<i>Size position</i>

<i>n</i>		<i>and physiological changes related to metabolism</i>	<i>movement (of foetus, organs etc. )</i>
		<i>Useful for detecting brain activity</i>	<i>Cannot penetrate bone – cannot examine brain</i>
			<i>Good for imaging soft tissues</i>
			<i>Cannot pass through air spaces / lungs</i>
		<i>Can provide info re malignancy and tumour spreading</i>	<i>Cannot distinguish between benign and malignant solid masses</i>

[6]

**M2.(a)** any **three** points from:

supplied radio pulse excite H **nuclei**

when H nuclei de-excite / change spin / change alignment they emit radio photon / signal / em radiation

these signals are detected and passed to computer

gradient in static magnetic field

to allow location to be determined  
or magnetic field aligns nuclei

*Allow Hydrogen protons for nuclei*

**Max 3**

(b) **any two reasons**, eg

(non-ionising) so no known harm caused to unborn baby,

*Accept correct reverse arguments for X-rays*

gives good images of soft tissue  
relatively cheap

*Do not allow better resolution*

2

[5]