

Q1. (2018)

12			D ✓	1	2.2	
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Q2. (2018)

13			C ✓	1	1.1	
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Q3. (2019)

11			B	1	1.2	
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Q4. (2019)

12			B	1	2.2	
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Q5. (2019)

A)

20	(c)		FIRST CHECK THE ANSWER ON ANSWER LINE If answer = 4×10^{-2} (mm) award 2 marks 0.04 ✓ = 4×10^{-2} (mm) ✓	2	2.2	ALLOW correct variations of standard form
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B)

20	(d)		increased resolution / high magnification / sub-cellular structures visible ✓ (can only be done on) dead material / thin sections only / gives 2-D / expensive (equipment) / possible distortion of material in preparation / less mobile / preparation takes longer/is more complex / (only) black and white images ✓	2	2.2	IGNORE clearer/sharper/more detailed images / can see small cells
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Q6. (2020)

6			D ✓	1	2.2	
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Q7. (2020) – 16a

		(iii)	reduces (total) SA of alveoli/air sacs / reduces SA : Vol ratio of alveoli/air sacs ✓ so diffusion (of oxygen) reduced ✓	2	2 x 3.1a	ALLOW harder for oxygen to diffuse IGNORE oxygen cannot diffuse into the blood in emphysema
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Q8. (2021)

6			D ✓	1	1.2	
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Q9. (2021)

15			B ✓	1	2.2	
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Q10. (2022)

9			A ✓	1	2.2	
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Q11. (2022)

A)

19	(a)	Retina is light sensitive/is where the receptors are found/is where the image is formed ✓ If damaged it may not detect light/the image ✓	2	1 x 1.1 1 x 2.1	ALLOW retina is where the light is focussed ALLOW idea that information about the image would not be able to be sent to the brain IGNORE if damaged, the image will not form
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B)

	(b)	Capillary ✓	1	1 x 1.1	
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C)

	(c)	(i)	Any two from: Sample size is very small / only two patients were tested ✓ Idea that the experiment showed an improvement not a cure ✓ (Only 1 year later,) eyesight could deteriorate in subsequent years ✓ Have not tested it on dry AMD / may not work on all forms of blindness / only one form of blindness was tested ✓	2	2 x 3.1a	ALLOW reference to possible long term side effects
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D)

		(ii)	Test more people / See if it cures dry AMD / See if it is safe/has side effects / See if it lasts long term / Determine the cost /	1	1 x 3.1a	IGNORE reference to age IGNORE reference to the damage increasing ALLOW possible named side effect
			Determine the availability of the stem cells ✓			

Q12. (2022)

	(b)	First check answer on answer line. If answer = 2.115×10^{13} award 3 marks correct multiplication of 4.7×4.5 appearing in the working ✓ multiplication of $\times 1\,000\,000$ appearing twice in the working / answer multiplied by 10^{12} ✓ $4.7 \times 4.5 \times 10^{12} = 2.115 \times 10^{13}$ ✓	3	3 x 2.2	ALLOW any correct rounding of 2.115×10^{13} ALLOW one mark for an incorrect answer if it is clearly shown that it has been correctly converted into standard form
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Q13. (2023) – 16b

A)

	(b)	(i)	Correct outline shape of this mitochondrion drawn with continuous lines and no shading ✓ Double outer membrane and internal membranes accurately drawn ✓	2	2 x 2.2	IGNORE labels
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B)

		(ii)	Electron microscope ✓ The image is highly magnified / The image is in a lot of detail / Can see organelles / The resolution is high ✓	2	2 x 2.1	ALLOW TEM or SEM Second marking point is dependent on the first IGNORE image is black and white ALLOW ORA for light microscopes for each reason
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C)

	(c)	Ribosome / cell membrane / cytoplasm ✓	1	1.1	
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Q14. (2024) – 21b

	(b)	<p>First check the answer on the answer line If answer = 11 400 award 4 marks</p> <p>Measures the line as 3.2cm/32mm ✓</p> <p>Converts 32mm to 32000 μm OR 2.8μm converted to 0.0028mm ✓</p> <p>32 000 $\div$ 2.8 = 11 428.57 OR 32 $\div$ 0.0028 = 11 428.57 ✓</p> <p>= 11 400 (3 s.f.) ✓</p>	4	3 x 2.2	<p>ALLOW answers in range 31 to 33mm</p> <p>ECF if line incorrectly measured</p> <p>ECF if line incorrectly measured or incorrect/no conversion</p> <p>1.2 ALLOW 1 mark for clear evidence of incorrect answer correctly rounded to 3 significant figures</p>
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