

Question 21 (Answer: **B**)

- In bright light the pupil must get smaller, to protect the retina.
- The circular muscles of the iris contract to narrow it.
- The radial muscles relax at the same time – the two sets always work in opposition.

Question 19 (Answer: **C**)

- Moving into bright light makes the pupil constrict, as the circular muscles contract.
- Looking at a *near* object makes the ciliary muscles contract and the lens become fatter.
- So both changes happen together: a smaller pupil and a more rounded lens.

Question 20 (Answer: **A**)

- For a *near* object the lens must be fatter.
- The ciliary muscles contract, which reduces the pull on the lens.
- So the suspensory ligaments go slack and the lens becomes more rounded.

Question 22 (Answer: **B**)

- Rod cells work in dim light, so they give night vision.
- They cannot distinguish colour – that is the job of the cone cells.
- So rods give night vision but not colour vision.

Question 24 (Answer: **C**)

- To focus on a *nearer* object the lens must become more powerful, so it needs to be fatter.
- The ciliary muscles contract, which slackens the suspensory ligaments.
- The lens then springs into a more rounded shape, refracting the light more strongly.

Question 24 (Answer: **B**)

- For a *near* object the lens must become fatter and refract the light more.
- The ciliary muscles contract, which slackens the suspensory ligaments.
- The lens then becomes thicker and refraction increases.

2(a)	<i>any four from:</i> 1 (overall) there are more rods than cones / ora ; 2 (number of) cones, peaks / are greater, at fovea / at 0 arbitrary units ; 3 <i>idea that</i> (number of) rods peak either side or are increasing going towards the fovea / 0 arbitrary units ; 4 no rods present at, fovea / 0 arbitrary units ; 5 <i>idea that</i> (number of) cones outside of fovea are (approximately), equal / constant ; 6 (number of) rods greater on left hand-side of fovea ;
2(b)	more rod (cells) / greater proportion of rod cells / AW ; <i>ref. to</i> (greater sensitivity) for, night vision / low light conditions / AW ; OR fewer cones ; colour vision less important / AW ;
2(c)(i)	pupil reflex ;
2(c)(ii)	circular muscle (of the iris) ;
2(c)(iii)	antagonistic ;
2(d)(i)	A – vesicle ; B – receptor (protein) ; C – (named) neurotransmitters ;
2(d)(ii)	diffusion ; by random movement of particles OR from higher concentration to lower concentration / down concentration gradient ;