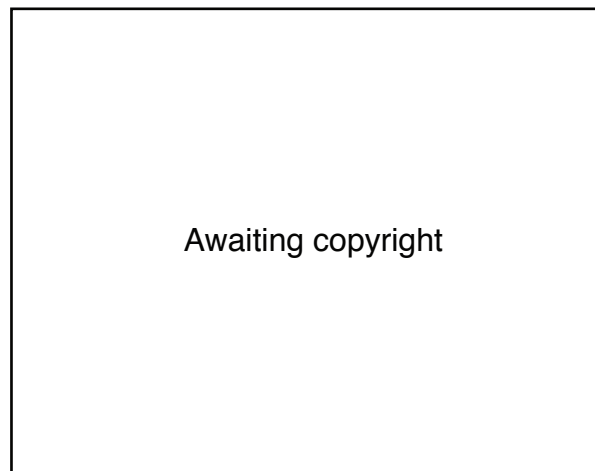


**Question 31 – Communication (25 marks)**

Answer parts (a)–(c) in a writing booklet.

- (a) Construct a table to identify the structures used by insects, fish and mammals to detect vibrations. **3**
- (b) The vocal folds are different when a person sings a high pitched note and a low pitched note. Draw TWO labeled diagrams to illustrate this difference. **4**
- (c) On the cross-section of the eye and the graph, corresponding retina locations are indicated according to their angle from the fovea.



- (i) What label should be given to the line Y? **1**
- (ii) Explain why the structure of cones varies depending on their location in the retina. **2**
- (iii) Outline the role of rhodopsin in rods. **2**

**Question 31 continues on page 29**

Question 31 (continued)

Answer parts (d)–(e) in a SEPARATE writing booklet.

- (d) In your course, you did a first-hand investigation on a mammalian brain similar to the one shown.

The brain shown is from a mammal that was brought into a vet surgery after surviving a fall. Brain testing showed no action potentials occurring in region X.



- (i) Explain TWO possible causes for the lack of action potentials in region X. **4**
- (ii) Outline how this condition could change the behaviour of the mammal. **2**
- (e) The following article was found in a newspaper.

**Movie experience just gets better and better –  
3D movies, 3D glasses and surround sound systems**

In a 3D movie, two different images are projected onto the same screen. 3D glasses are worn by the audience to ensure that one image is seen by one eye and the other image is seen by the other eye.

Surround sound systems allow sounds to be produced in different areas of a cinema so that members of the audience feel like they are at the centre of the action that is displayed on the screen.

These new technologies use our knowledge of depth perception, sound shadows and how sights and sounds are received, transmitted and then interpreted by the brain to improve our movie experience.

- Evaluate how our understanding of the eye and the ear has led to the development of technologies such as those above. **7**

**End of Question 31**