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a) i) The organ of corti are hair cells that detect vibration, & send these ~~vibration~~ through the central nerves system ~~through~~ as electro-chemical messages, to the brain.

ii) The Frequency ~~of a wave length~~ & wavelength of sound waves determine the pitch of a sound. If there ~~are~~ is a small frequency between waves, & a high wavelength, the sound will be high pitched If the waves are further apart (not as frequent) & have a lower wave length, then the ~~sound~~ sound is of lower pitch.

iii) ~~In~~ such mammals as humans use laygrinx to produce sound. The laygrinx is constructed of 9 cartilage ring to which some ~~sound~~ vocal cords are attached. Air rushes up from the diaphram, & the degree of tension on the vocal cords & laygnx control the sound produced.

Some insects such as grasshoppers produce sound by rubbing there legs against their ~~&~~ abdomense. ~~The~~ both the legs and the abdomine have rough surfaces. When rubbed together, a cherping sound is produced by the grasshopper.

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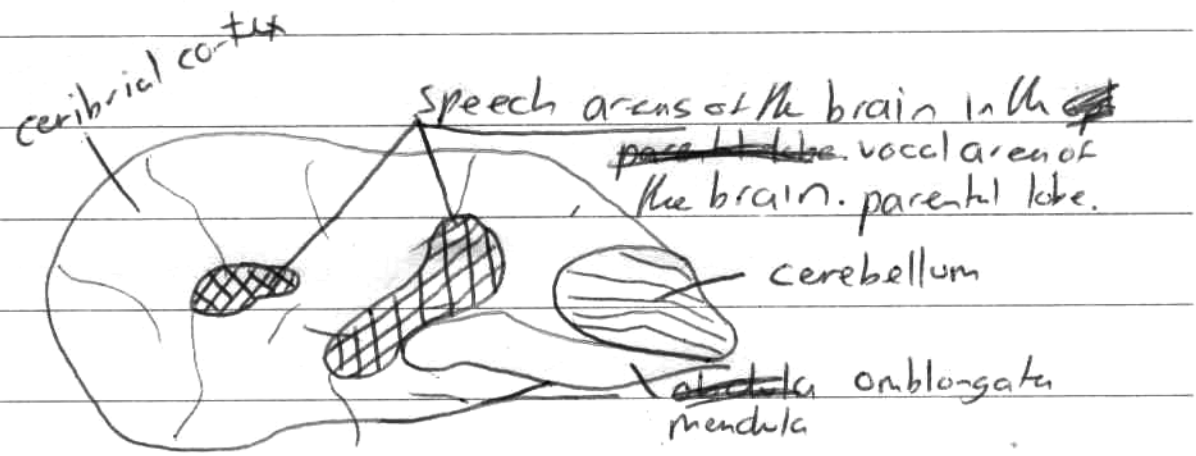
b) ~~Cerebrum = area just under the cerebral~~

i) Medulla oblongata = long thin, sausage like structure starting just above the cerebellum & running along the cerebrum.

Cerebellum = area of dark tissue at the back of the brain. Just above the ~~&~~ Medulla Oblongata. ~~long thin~~ smaller than the cerebrium

Cerebrum = area under the cerebral cortex in which ~~two~~ functionable hemisphere can be ~~seen~~ seen. Larger than the Cerebellum & obdul onblongata

ii)



Left hemisphere of brain

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c) ii)

ii) ~~The~~ As the thickness of the lens decrease (thus becomes thiner) the focal length increases

iii) At a far distance, the ciliar muscels ~~the~~ which control the accomodation of the eye relax. This makes the ~~the~~ lens thinner, thus making the focal length ~~long~~ longer. This enables the ~~retina to be able to~~ for image to be focused on the retina.

D) Before light get to the photoreceptor cells that enable images to be produced, light needs to be go through a number of other cells before it reaches the retina.

Ganglian → Amerine → Horozontal → Bipolar → photoreceptor.

Once ~~the~~ the ~~photoreceptor cells~~ photoreceptor cells light has reached the photoreceptor cells, the photoreceptor cells absorb this light. In the 'rod' cells light is absorbed in only the blue range of the light scale due to the photopsin for blue light being the only redopsin present. However the image produced by the rods are very sharp. Rod cells are used in mainly dull light situations. 'Cone' cell detect colour in the red, green & blue through diff photopsins, and

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can distinguish colour extremly well, but image arn't quite as sharp. In these photoreceptor cell, the light that has been focused on the retina is transmitted to electro chemicals. The image is transpected to the brain through the actions of these electron chemical impulses being carryed to the brain through neurons (spesific cells). These neuron form the central nervous system. The electro chemical signals from the retina are transmitted from the synaptic teminal of the cell through neurotransmitters. These neurotransmitters travel across the snapsis & hit the synaptic terminal of the next cell. In cells there is a + charge due to K^+ ions being inside a cell, Na^+ ions outside. When the neurotransmitter touches the next cell it causes it to depolarise & change charges. This causes a 'chain reaction' till eventually the message is taken to the brain for the image to be arranged.

2002 HIGHER SCHOOL CERTIFICATE EXAMINATION

Biology

This page is to be detached, completed and attached to the inside front cover of your writing booklet for the option question you have attempted.