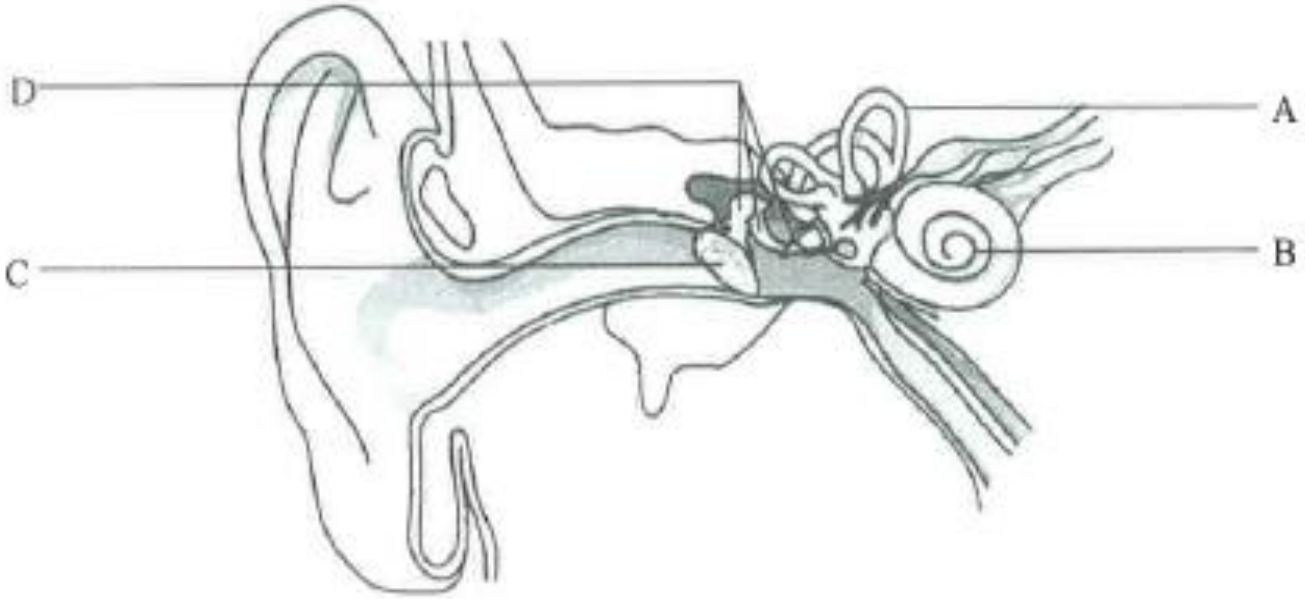
Paper 1 B

Q. 1, 7, 11

Question Number	Performance in General
1	Good
7	Satisfactory
11	Poor

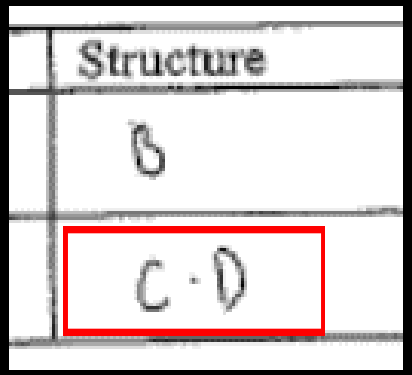
1. The diagram below shows the human ear and its associated structures:

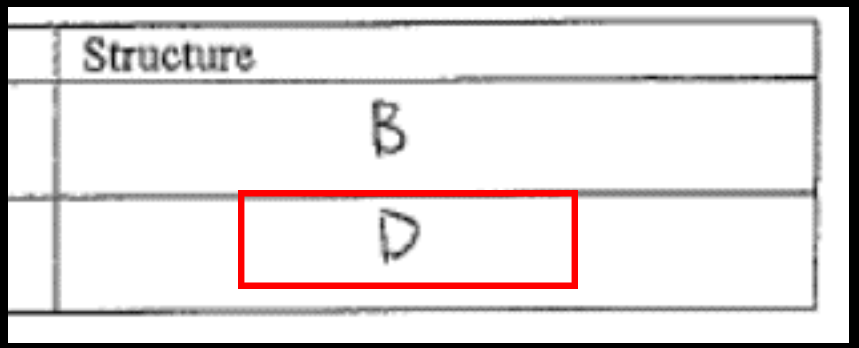


(a) The table below lists two types of hearing loss. Using the label(s) in the above diagram, indicate which structure(s) is / are most likely to be defective in each case. (2 marks)

	Type of hearing loss	Structure
X	Damage to sensory hair cells	
Y	Failure of sound conduction	

(a)
- B (1)
- C and D (1)





Good

Many candidates gave only C or D as the answer

(b) Ludwig van Beethoven, a famous 18th century composer, suffered from type Y hearing loss in his 20s and became deaf in his 40s. Some records say that he could hear music through his jawbone and skull by biting on a metal rod attached to his piano. Based on the structures and functions of human ears, complete the following flow chart to show the major steps involved in his method of hearing music. (4 marks)

(i) _____ of the metal rod

↓

transmission through bones to reach (ii) _____

↓

detection of (iii) _____ movement by sensory hair cells

↓

generation and transmission of nerve impulses through (iv) _____

↓

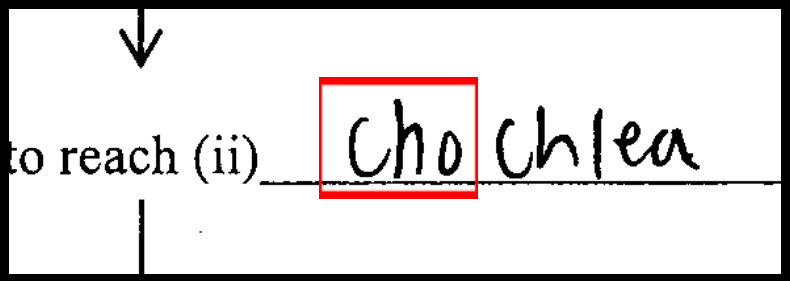
interpretation at the sensory area of the cerebrum

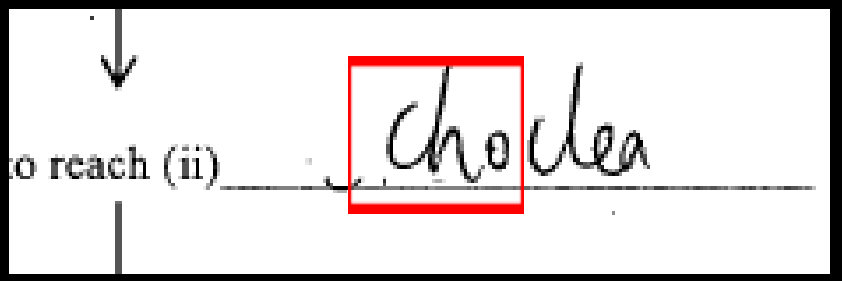
(b) (i) vibrations (1)

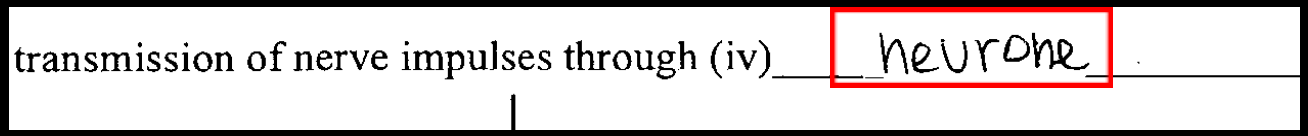
(ii) oval window / cochlea (1)

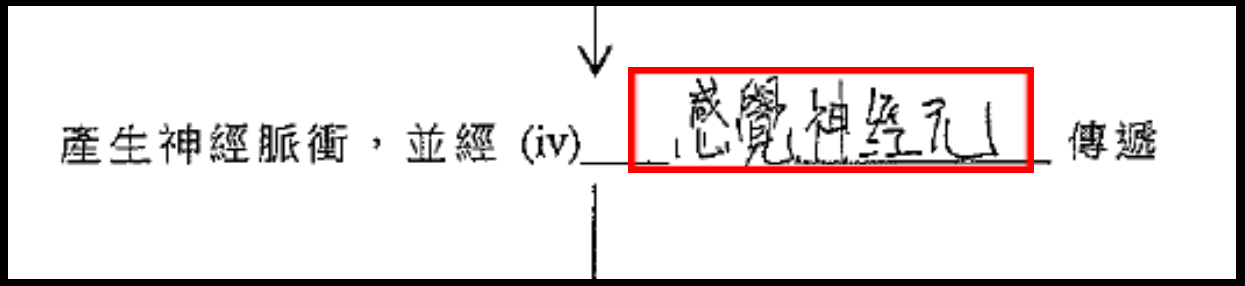
(iii) lymph / fluid (1)

(iv) auditory nerve (1)


to reach (ii) Cho Chlea


o reach (ii) choclea


transmission of nerve impulses through (iv) neurone


產生神經脈衝，並經 (iv) 感覺神經元 傳遞

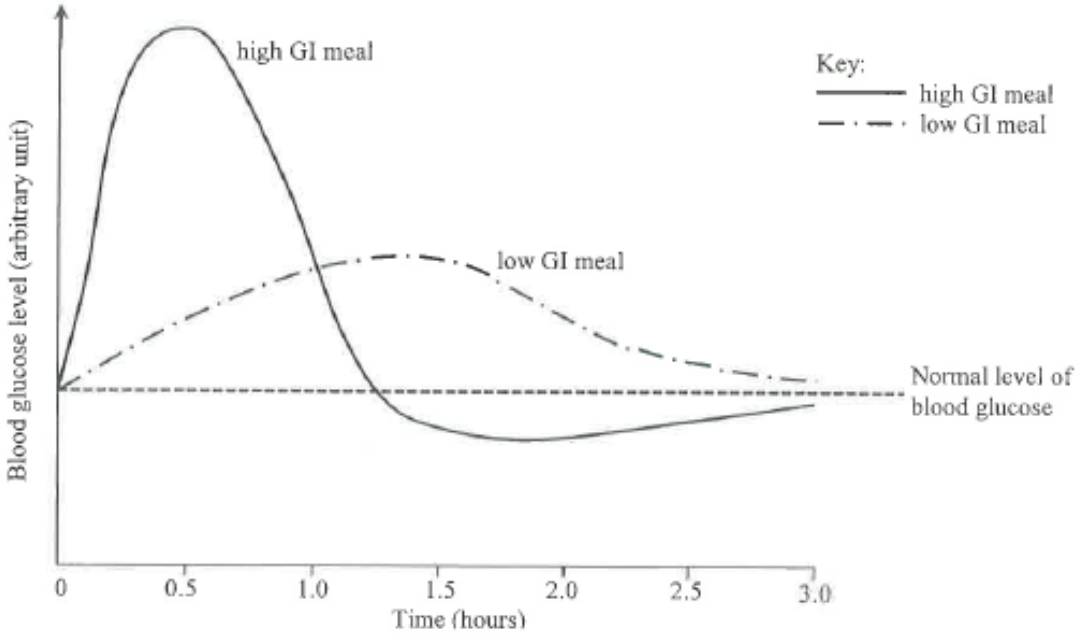
Good

Many candidates wrongly spelt the word cochlea.

Many candidates did not know that vibrations would set the fluid inside the cochlea in motion.

Some mixed up sensory neurons with auditory nerve

7. The glycemic Index (GI) is an indication of the effect of food on the blood glucose level. The higher the GI value of a food, the quicker is the rise in blood glucose level. The graph below shows the changes in the blood glucose level of a healthy individual after consuming the same quantity of a low GI or high GI meal over a period of three hours:



(a) Describe how the consumption of a meal leads to an increase in the blood glucose level. (2 marks)

(b) (i) Name the key hormone which lowers the blood glucose level. (1 mark)

(ii) Describe how this hormone lowers the blood glucose level. (3 marks)

(iii) On the graph on the opposite page (page 10), sketch a curve to show the change in the level of this key hormone in response to the consumption of a high GI meal by the healthy person. (2 marks)

(c) Explain why diabetic patients should consume low GI meals. (2 marks)

(a)
- digestion of foods containing carbohydrates to form glucose (1)
- absorption of glucose from the small intestine into the blood (1)

(b) (i)
- insulin* (1)

(ii)
- it stimulates the body cells and liver cells to take up more glucose from blood (1)
- increases respiration in body cells to consume glucose (1)
- it stimulates the conversion of glucose to glycogen by the liver / muscle cells (1)

(iii)
- has initial basal value and drops back to basal value at the end (1), effect lags behind (1)

(c)
- low GI food will lead to small fluctuations in blood glucose level (1)
- the chance of having too high blood glucose level / glucose appearing in urine is reduced (1)

(a) 描述進餐後如何導致血液葡萄糖水平上升。 (2 分)

進餐後，食物被酶分解成葡萄糖，而葡萄糖經擴散進入血液，導致血液內葡萄糖水平上升。

Glucose is then absorbed in blood by active transport. This increase blood glucose level.

Satisfactory

The answers of some candidates often lacked some key information e.g. digestion without mentioning glucose, absorption without mentioning small intestine

(ii) 描述這激素如何降低血液葡萄糖水平。 (3 分)

胰島素有效而減葡萄糖，使葡萄糖轉化為糖原，因此降低血液葡萄糖水平。

When the hypothalamus detect the increase in blood glucose level. It stimulates the pitnatary gland to release more insulin. Insulin stimulate liver cells to convert glucose to glycogen for storage. Blood glucose level is then return to normal level.

Fair

Candidates often gave incomplete or inaccurate descriptions of the functions of insulin.

Many candidates wrongly stated that insulin converted glucose to glycogen. In fact, it binds to the receptors of target cells and stimulates the uptake of glucose from blood.

If they consume high GI meals, their blood glucose level will still remain high after a long period of time and need a longer time to return to normal level.

所以如果进食高GI膳食会令糖尿病患者的血糖水平维持高水平，而身体没有足够的胰岛素降血糖水平降低会出现性命危害。所以要进食低GI膳食血糖水平维持在正常水平就安全了。

Poor

Many candidates focused their discussion on the undesirable outcomes of consuming high GI meal

but failed to point out the pros of consuming low GI meals.

For the following question, candidates are required to present their answer in essay form. Criteria for marking will include relevant content, logical presentation and clarity of expression.

11. Sharon was told that she might be breathing out carbon dioxide containing carbon which was once a part of the body of a dinosaur, buried underground for millions of years. Use your biological knowledge to describe the journey of the carbon. The journey should include how it is possible for the carbon derived from a dinosaur buried underground to go through millions of years and appear in the form of carbon dioxide in Sharon's breath.

(11 marks)

(A) How the carbon atom was released from dinosaur to the atmosphere (max 1 mark)

the dead body of the dinosaur might be

- decomposed by microorgansisms to form carbon dioxide containing the carbon atom (1)
- turned into a portion of fossil fuels, which is then released as carbon dioxide to the atmosphere by combustion (1)

(B) The cycling of the carbon atom before reaching Sharon (max 3 marks)

- the carbon dioxide containing the carbon atom was used by plants in photosynthesis (1)
- and converted to organic matter (1)
- the carbon passed on to consumers by feeding the plants / passed along the food chain (1)
- the carbon atom in the biomass of these organisms would be released to the atmosphere by respiration / decomposition (1)

this cycle repeated until the carbon atom finally reached Sharon

Carbon Journey.

The oxygen are absorbed by the animals and free for the respiration to provide energy for them. During the respiration, the carbon dioxide was produce, the carbon dioxide dissolve into water and stay the ~~astmos~~ atmosphere, The producer like, grass and tree, have absorb the carbon dioxide and ~~p~~ starting the photosynthsis, to produce out the oxygen. The carbon dioxide ~~then~~ in the water then absorb by lime stone, this stone produce the water to the soil, became the under ground. water.

是呼吸氧氣在呼吸的过程中，經过氣循環及氧化碳轉化的过程。而這些过程会釋出ATP及NADPH的產物。這些產物可提供能量以支持过程。而NADPH也能作还原劑，把二碳化合物變成葡萄糖，令整个过程能够不斷繼續發生。

8. 有人告訴小玲，她呼出的二氧化碳中的碳，可能源自埋藏在地底數百萬年的恐龍身體的一部分。運用你的生物學知識，描述該碳的旅程。這旅程應包括來自埋藏在地底恐龍的碳，如何能夠在經歷數百萬年後出現在小玲呼出的二氧化碳內。 (11 分)

空氣中的碳會進行碳循環，分解者進行分解作用將土壤中的含碳化合物分解為氨，後土壤進行固氮作用將含碳化合物轉為碳酸鹽。

首先由於分解者吸收動物屍體或腐生生物從中將有機營養物進行無機營養物，然後進行呼吸作用將碳釋出，其次空氣中的碳循環被生產者進行光合作用生產澱粉，再被其他消費者攝食，最後消費者死後體內的碳又被分解者吸收，形成碳循環。由於腐生生物從泥土中吸取礦物質從中亦可能吸取地底中的碳，導致這些碳回到地面進行碳循環。由於地底內的土壤進行分解、硝化、固氮作用等等，會使土壤中的碳轉化為含碳化合物再轉為碳酸鹽再轉為碳再被植物吸收。

而人類進行呼吸作用時，空氣因肺內壓強低於大氣壓強而進入肺，而空氣中的碳可說是人類燃燒化石燃料時生成的；空氣進入肺後，會在氣囊進行氣體交換，氣囊外的微血管的氧含量低，氣囊內的氧會經薄水膜擴散入微血管；而微血管的二氧化碳濃度高，二氧化碳會藉擴散經薄水膜溶解動到氣囊，並因肺內壓強高於大氣壓強而呼出體內。因此小強呼出的二氧化碳會含有來自埋藏在地底恐龍的碳

11. Poor performance. The question was structured as two parts:
(1) The carbon atom released from dinosaur AND carbon cycle
(2) Sharon obtained the carbon atom AND the carbon atom inside her body

(1) Poor performance. Many candidates wrote a lengthy description of the formation of fossil fuels. Most candidates simply recited the details of the carbon cycle without gearing their answers to include the dinosaur and Sharon.

For the following question, candidates are required to present their answer in essay form. Criteria for marking will include relevant content, logical presentation and clarity of expression.

11. Sharon was told that she might be breathing out carbon dioxide containing carbon which was once a part of the body of a dinosaur, buried underground for millions of years. Use your biological knowledge to describe the journey of the carbon. The journey should include how it is possible for the carbon derived from a dinosaur buried underground to go through millions of years and appear in the form of carbon dioxide in Sharon's breath. (11 marks)

(C) How Sharon obtained the carbon atom (max 2 marks)

- Sharon obtained the carbon atom by feeding / from the food chain (1)
- the food containing the carbon atom was digested and absorbed in the small intestine (1)
- Sharon breathes in the carbon dioxide containing the carbon atom and breathes out (1)

(D) What happened inside Sharon's body (max 2 marks)

- the absorbed food containing the carbon atom travels along the circulatory system (1)
- and is taken up by body cells for respiration (1)
- to form carbon dioixde (1)
- the carbon dioxide containing the carbon atom travels along the circulatory system to the lungs for gas exchange / breathing out (1)

植物的根部吸收扩散入植物体内，当小玲吃掉蔬菜，人体内会再吸收经气体交换呼吸作用呼出 CO_2。因此小玲吁

plant is transfered to body of animal. When Sharon feed on plant or animal, organic carbon stored in plant or animal will be transfered into body of Sharon.

During respiration, Sharon break down $C_6H_{12}O_6$ which is a organic carbon to release energy in cell. $C_6H_{12}O_6$ is breaked down, CO_2 is released in bridging ation and krebs cycle in respiration.

11. Poor performance. The question was structured as two parts
(1) The carbon atom released from dinosaur AND carbon cycle
(2) Sharon obtained the carbon atom AND the carbon atom inside her body

(2) Poor performance.

Candidates usually forgot to give the details of the journey of the carbon inside her body. They seldom mentioned the roles of the circulatory system in the transport of absorbed food and the transport of carbon dioxide to the lungs for excretion.

Marks awarded for effective communication	Percentage of candidates
0	49
1	25
2	12
3	9

Candidates were generally weak in selecting relevant information (to paraphrase the knowledge to meet the requirements stated in the questionand and relate the knowledge to the given scenario)

They were also weak in organizing their ideas (to address the flow of the carbon atom in different forms).

Thanks