MEGA LECTURE

AQA (GCSE Notes)

Chapter 2: Organisation

Q1. What are cells and why are they considered the basic building blocks of life?

Q2. Define a tissue and explain how it differs from an organ.

Q3. How are organs formed and what is their function in an organism?

Q4. Describe how organs are organised into systems within the human body.

Q5. Give an example of how a tissue works within an organ.

Q6. What is meant by the term ‘organ system’?

Q7. Explain how size and scale relate to cells, tissues, organs, and systems.

Q8. Why is it important for cells to work together as tissues?

Q9. Describe how different tissues in the stomach work together to perform digestion.

Q10. Explain how organ systems work together to maintain life in an organism.

Q11. Describe the overall function of the human digestive system.

Q12. Name the main organs involved in the human digestive system.

Q13. Explain how the stomach contributes to the digestive process.

Q14. What role does the small intestine play in digestion and absorption?

Q15. How do enzymes speed up chemical reactions in the body?

Q16. Describe the ‘lock and key’ theory for enzyme activity.

Q17. How does temperature affect the activity of enzymes?

Q18. Why is pH important for enzyme function?

Q19. What happens to enzyme activity if the pH is too high or too low?

Q20. What is the function of amylase in the digestive system?

Q21. Where is amylase produced and where does it act?

Q22. What are the products of starch breakdown by amylase?

Q23. Name the enzymes that break down proteins and their products.

Q24. Where are proteases produced in the human body?

Q25. What are lipases and what do they break down?

Q26. What are the end products of lipid digestion?

Q27. Why is digestion necessary before absorption of food molecules?

Q28. How are the products of digestion used in the body?

Q29. What happens to the glucose produced by digestion?

Q30. What is the role of bile in digestion?

Q31. Where is bile made and where is it stored?

Q32. How does bile help lipase work more effectively?

Q33. What is emulsification and why is it important in digestion?

Q34. Explain how the alkaline nature of bile aids fat digestion.

Q35. How do digestive enzymes differ in terms of the substrates they act upon?

Q36. Give a word equation for the breakdown of starch.

Q37. Why are chemical symbol equations not required at this level?

Q38. Explain the importance of surface area in enzyme action.

Q39. What are soluble molecules and why must food be converted into them?

Q40. What would happen if the body did not produce bile?

Q41. Why must enzyme action be specific to one type of molecule?

Q42. What could happen if an enzyme's active site changes shape?

Q43. Describe a method to investigate the effect of pH on enzyme activity.

Q44. Describe a method to investigate the effect of temperature on enzyme activity.

Q45. What calculation could you use to find the rate of an enzyme-catalysed reaction?

Q46. Why is it important for enzymes to work quickly in digestion?

Q47. How does the structure of the small intestine help with absorption?

Q48. What is the role of the circulatory system after digestion has occurred?

Q49. How does the failure of one organ system affect the whole organism?

Q50. Why is a healthy diet and lifestyle important in preventing digestive system problems?

Q51. Describe the structure and function of the human heart.

Q52. What is meant by a double circulatory system in humans?

Q53. Explain the role of the right ventricle in blood circulation.

Q54. What happens to the blood when it passes through the lungs?

Q55. Describe the function of the left ventricle in the circulatory system.

Q56. Name the main blood vessels connected to the heart and describe their functions.

Q57. What is the function of the aorta?

Q58. What is the function of the vena cava?

Q59. What is the role of the pulmonary artery?

Q60. Describe the function of the pulmonary vein.

Q61. What do the coronary arteries do?

Q62. Why is it important that blood flows through the coronary arteries?

Q63. Name the structures involved in the human lungs used for gaseous exchange.

Q64. Describe the function of the trachea in the respiratory system.

Q65. What is the role of the bronchi in the respiratory system?

Q66. Describe the structure and function of alveoli.

Q67. Explain how the alveoli are adapted for efficient gas exchange.

Q68. What surrounds the alveoli and why is it important?

Q69. How does oxygen move from the lungs into the blood?

Q70. How is carbon dioxide removed from the blood into the lungs?

Q71. What is the natural pacemaker of the heart and where is it found?

Q72. What is the purpose of an artificial pacemaker?

Q73. How do artificial pacemakers help people with heart conditions?

Q74. What are arteries and how are they adapted to their function?

Q75. Describe the structure and function of veins.

Q76. How do valves in veins help blood flow?

Q77. Describe the structure and role of capillaries.

Q78. How do capillaries allow efficient exchange of substances?

Q79. Explain why arteries have thick muscular walls.

Q80. Why do veins have thinner walls compared to arteries?

Q81. Compare the pressure of blood in arteries and veins.

Q82. Explain how blood flows from the heart to the lungs and back again.

Q83. What compound measure can be used to calculate the rate of blood flow?

Q84. How could you calculate the rate of blood flow through an organ?

Q85. What is blood and what does it consist of?

Q86. Name the four main components of blood.

Q87. What is the function of plasma in the blood?

Q88. Describe the function of red blood cells.

Q89. How are red blood cells adapted to carry oxygen?

Q90. What is the function of white blood cells?

Q91. How do white blood cells protect the body from disease?

Q92. What is the role of platelets in the blood?

Q93. How do platelets help to prevent blood loss?

Q94. Why is it important to observe blood cells under a microscope?

Q95. Describe how different blood cells can be identified in diagrams.

Q96. Explain why red blood cells do not have a nucleus.

Q97. How does the shape of a red blood cell help its function?

Q98. Evaluate the risks involved in using donated blood products.

Q99. How can transfusions of blood be life-saving?

Q100. Describe how the components of blood work together to support body functions.

Q101. What causes coronary heart disease and how does it affect the heart?

Q102. Explain how a build-up of fatty material affects blood flow in coronary arteries.

Q103. Why does reduced blood flow in coronary arteries lead to a lack of oxygen in heart muscle?

Q104. What is the purpose of using stents in coronary heart disease?

Q105. How do stents help reduce the symptoms of coronary heart disease?

Q106. What are statins and how do they help in treating heart disease?

Q107. Describe the role of cholesterol in the development of coronary heart disease.

Q108. What are the possible side effects of taking statins?

Q109. What are the advantages of using stents to treat narrowed arteries?

Q110. Compare the benefits and risks of using statins versus stents.

Q111. What problems can occur when heart valves become faulty?

Q112. Describe how a faulty heart valve affects blood flow through the heart.

Q113. What are the differences between biological and mechanical valve replacements?

Q114. Why might a patient need a heart valve replacement?

Q115. What are the risks involved in heart valve replacement surgery?

Q116. When might a heart transplant be needed?

Q117. What is the difference between a heart transplant and using an artificial heart?

Q118. Describe two situations where an artificial heart might be used.

Q119. What are the advantages of using an artificial heart while waiting for a transplant?

Q120. List some potential disadvantages of using an artificial heart.

Q121. Why must the risks and benefits of different heart disease treatments be evaluated?

Q122. Explain how mechanical devices can be used to support the heart.

Q123. How might recovery from heart surgery be supported with technology?

Q124. Why is it important to consider quality of life when choosing a treatment option?

Q125. Define health in terms of physical and mental well-being.

Q126. What is the difference between communicable and non-communicable diseases?

Q127. Give two examples each of communicable and non-communicable diseases.

Q128. How can diet affect a person's physical health?

Q129. How can stress influence mental and physical health?

Q130. What does it mean when diseases interact with each other?

Q131. Explain how immune system defects increase the risk of infectious diseases.

Q132. How can viruses lead to cancer development?

Q133. What is the link between immune reactions and allergic responses?

Q134. How can a long-term physical illness lead to mental illness?

Q135. Why is it important to study how diseases interact?

Q136. How can epidemiological data be used to understand health trends?

Q137. What is the importance of sampling in health studies?

Q138. Describe how a scatter diagram could show a link between smoking and heart disease.

Q139. How can bar charts be used to compare the rates of different diseases?

Q140. What are the benefits of using histograms in presenting health data?

Q141. How would you construct a frequency table for the number of people with asthma in a population?

Q142. Explain how to interpret a scatter diagram that shows a positive correlation.

Q143. What is meant by correlation and how does it apply to disease research?

Q144. Give an example of two variables in health studies that may show a correlation.

Q145. Why is it important to convert between numerical and graphical data in science?

Q146. How might scientists use data to support the claim that exercise reduces heart disease?

Q147. How do scientists ensure that their health data samples are reliable?

Q148. What is a control group and why is it important in health research?

Q149. How can bias be reduced when collecting data on disease incidence?

Q150. Why is understanding health data important for public health decisions?

Q151. What is a non-communicable disease and how is it different from a communicable disease?

Q152. How does an unhealthy diet increase the risk of non-communicable diseases?

Q153. Explain how smoking affects the risk of developing cardiovascular diseases.

Q154. In what way can regular physical activity reduce the risk of heart disease?

Q155. How does alcohol misuse affect the function of the liver?

Q156. What are the long-term effects of alcohol on brain function?

Q157. How can smoking and alcohol use during pregnancy harm the unborn baby?

Q158. What are risk factors and how are they linked to disease development?

Q159. Name three lifestyle-related risk factors and the diseases they are linked to.

Q160. How can substances in the environment act as risk factors for disease?

Q161. What is meant by a causal mechanism in disease research?

Q162. Give an example of a risk factor with a proven causal link to a disease.

Q163. Why is it difficult to prove a causal relationship for some risk factors?

Q164. What is the relationship between obesity and Type 2 diabetes?

Q165. How does smoking damage the lungs and lead to disease?

Q166. What is the link between smoking and the development of lung cancer?

Q167. How can alcohol use lead to damage of the nervous system?

Q168. Why is it important to understand the combined effects of multiple risk factors?

Q169. How do poor lifestyle choices impact health at a national level?

Q170. What are the global consequences of widespread non-communicable diseases?

Q171. What is the human cost of living with a chronic non-communicable disease?

Q172. How do non-communicable diseases affect the economy of a country?

Q173. What is a carcinogen? Give one example.

Q174. How does ionising radiation increase the risk of cancer?

Q175. What is the difference between correlation and causation in health data?

Q176. How can scientists use scatter diagrams to study disease risk?

Q177. Why is it useful to present disease data in bar charts or histograms?

Q178. How can a line graph help track trends in non-communicable disease over time?

Q179. What is the purpose of using sampling in health studies?

Q180. How can researchers ensure their sample represents a population accurately?

Q181. How might researchers identify a correlation between alcohol use and liver disease?

Q182. What is meant by interpreting data between graphical and numerical forms?

Q183. What are the benefits of using data tables in studying disease risk?

Q184. What is the purpose of using frequency tables in public health studies?

Q185. What can a scatter diagram tell us about the relationship between smoking and cancer?

Q186. What is cancer and how does it develop in the body?

Q187. Describe the process that leads to uncontrolled cell growth in cancer.

Q188. What is the difference between a benign and a malignant tumour?

Q189. How do malignant tumour cells spread in the body?

Q190. What are secondary tumours and how are they formed?

Q191. Why are benign tumours generally less dangerous than malignant ones?

Q192. How can lifestyle choices influence the risk of developing cancer?

Q193. Name two lifestyle-related risk factors for cancer and the types they are linked to.

Q194. What is the role of genetic factors in the development of some cancers?

Q195. Why is early detection of cancer important for treatment success?

Q196. Describe one method used to detect cancer at an early stage.

Q197. How can public health campaigns reduce cancer risk in the population?

Q198. Why is it important to continue research into cancer causes and treatments?

Q199. What is the difference between cancer prevention and cancer treatment?

Q200. How can a person reduce their personal risk of developing cancer?

Q201. What is a tissue and how is it defined in plants?

Q202. Name five plant tissues and describe the general role of each.

Q203. How is the epidermal tissue of a plant adapted for its function?

Q204. What is the function of the palisade mesophyll in the leaf?

Q205. How is the structure of the palisade mesophyll related to its function?

Q206. What is the role of the spongy mesophyll in a leaf?

Q207. How does the structure of the spongy mesophyll support gas exchange?

Q208. What is the function of xylem tissue in plants?

Q209. How is xylem tissue adapted for water transport?

Q210. What is the function of phloem tissue in plants?

Q211. How is phloem tissue adapted to carry dissolved sugars?

Q212. Where is meristem tissue found in a plant and what is its function?

Q213. Why is the leaf considered an organ in a plant?

Q214. What is the role of guard cells in a leaf?

Q215. How do guard cells help control water loss in a plant?

Q216. What are stomata and what is their role in plant function?

Q217. How do stomata open and close?

Q218. What is the relationship between stomata and transpiration?

Q219. How is a transverse section of a leaf useful for studying plant tissues?

Q220. How is the root hair cell adapted for absorption of water?

Q221. What process allows root hair cells to absorb water from the soil?

Q222. How do root hair cells take in mineral ions from the soil?

Q223. Explain how xylem and phloem work together in the transport system of a plant.

Q224. Describe the pathway of water from the roots to the leaves in a plant.

Q225. What is transpiration and why is it important for the plant?

Q226. What environmental factors affect the rate of transpiration?

Q227. How does temperature affect transpiration rate?

Q228. Explain how humidity can influence the rate of transpiration.

Q229. What effect does air movement have on transpiration rate?

Q230. How does light intensity affect the rate of transpiration?

Q231. What is the role of lignin in xylem vessels?

Q232. What is translocation and where does it occur in a plant?

Q233. Why is translocation important for the survival of a plant?

Q234. How is phloem tissue structured to support translocation?

Q235. What are sieve plates and what is their role in phloem tissue?

Q236. How can the rate of transpiration be measured in an experiment?

Q237. What data would you collect when measuring transpiration with a potometer?

Q238. How could you calculate the average transpiration rate from repeated measurements?

Q239. Describe how you would use a microscope to investigate stomata distribution.

Q240. Why might stomata be found more on the underside of a leaf?

Q241. How can you calculate the surface area of a leaf for a transpiration investigation?

Q242. What is the significance of using compound measures when studying transpiration?

Q243. How would you use a graph to show the effect of light on transpiration rate?

Q244. What graph would best display the relationship between humidity and transpiration?

Q245. How would you extract and interpret data from a table showing transpiration rates?

Q246. Why do plants need both water and dissolved minerals transported to the leaves?

Q247. How do the stem and leaves work together to move substances in a plant?

Q248. What is the function of the plant's organ system made up of roots, stems, and leaves?

Q249. Why is active transport important in the uptake of mineral ions by root hair cells?

Q250. How do structural adaptations in leaves support photosynthesis and water regulation?