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Biology Topic 6 AQA Exam Questions:
Inheritance, Variation, and Evolution

Exam Questions/Mock Exam Questions

Questions For Foundation, Higher, and Triple Science (scroll down for questions for higher and triple science only):
(It would still be recommended to answer the foundation tier questions for triple science and higher tier to ensure you have good understanding).

Q1. Organisms pass on characteristics to their offspring through genetic material.

(a) What is the name of the molecule that carries genetic information?

_____

_____

(1)

(b) Where in the cell is this molecule found?

_____

(1)

[Total: 2 marks]

Q2. Chromosomes come in pairs in human body cells.

(a) How many chromosomes are found in a normal human body cell?

_____

(1)

(b) How many chromosomes are found in a human gamete?

_____

(1)

[Total: 2 marks]

Q3. Sexual reproduction produces variation.

(a) Explain why offspring produced by sexual reproduction are genetically different.

(2)

(b) Name the type of cell division that produces gametes.

(1)

[Total: 3 marks]

Q4. Asexual reproduction involves only one parent.

(a) Describe the genetic makeup of offspring produced in asexual reproduction.

(2)

(b) Give one example of an organism that reproduces asexually.

(1)

[Total: 3 marks]

Q5. Genes determine inherited characteristics.

(a) What is a gene?

(2)

[Total: 2 marks]

Q6. Alleles are different versions of the same gene.

(a) What is meant by a dominant allele?

(2)

(b) What is meant by a recessive allele?

(2)

[Total: 4 marks]

Q7. Some characteristics are controlled by a single gene.

(a) Give one example of a characteristic controlled by a single gene.

(1)

[Total: 1 mark]

Q8. Genetic diagrams help to show inheritance.

(a) What letters are used to represent dominant and recessive alleles?

(2)

(b) What is the genotype of an organism with two identical alleles?

(1)

[Total: 3 marks]

Q9. Cystic fibrosis is caused by a recessive allele.

(a) What is the chance of two carriers having a child with cystic fibrosis?

(1)

(b) Explain why genetic screening can be useful.

(2)

[Total: 3 marks]

Q10. Some inherited disorders can be detected using embryos.

(a) What is embryo screening?

(2)

(b) Suggest one reason why some people may be against embryo screening.

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(1)

[Total: 3 marks]

Q11. Variation can be genetic or environmental.

(a) Give one example of genetic variation in humans.

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(1)

(b) Give one example of environmental variation in humans.

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(1)

[Total: 2 marks]

Q12. Mutation is a change in DNA.

(a) Give one possible result of a mutation.

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(1)

(b) Are most mutations harmful, beneficial, or neutral?

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(1)

[Total: 2 marks]

Q13. Charles Darwin developed the theory of natural selection.

(a) What is meant by 'natural selection'?

(2)

(b) Why was Darwin's theory not accepted straight away?

(2)

[Total: 4 marks]

Q14. Fossils provide evidence for evolution.

(a) Describe how fossils are formed.

(3)

[Total: 3 marks]

Q15. Selective breeding is used in agriculture.

(a) What is meant by selective breeding?

(2)

(b) Give one disadvantage of selective breeding.

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(1)

[Total: 3 marks]

Q16. Genetic engineering can be used in plants and animals.

(a) What is meant by genetic engineering?

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(2)

(b) Give one benefit of genetically modified (GM) crops.

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(1)

[Total: 3 marks]

Q17. Extinction can occur when a species cannot adapt.

(a) Suggest one reason why a species might become extinct.

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(1)

[Total: 1 mark]

Q18. Evolutionary relationships are studied using classification.

(a) What is classification?

(2)

(b) Name the highest level in the classification system.

(1)

[Total: 3 marks]

Q19. New models of classification have developed over time.

(a) What is the three-domain system?

(2)

[Total: 2 marks]

Q20. Understanding DNA helps scientists study evolution.

(a) Suggest one way DNA evidence can be used to study relationships between organisms.

(2)

[Total: 2 marks]

Q21. Different species have different numbers of chromosomes.

(a) Suggest how scientists could tell if two organisms are different species.

(2)

[Total: 2 marks]

Q22. Bacteria can evolve quickly.

(a) Explain how overuse of antibiotics has led to antibiotic resistance.

(3)

[Total: 3 marks]

Q23. Understanding inheritance helps with medicine.

(a) Give one reason why scientists study inherited diseases.

(1)

(b) Suggest one way this knowledge can improve treatments.

(2)

[Total: 3 marks]

Q24. Living things share similar characteristics.

(a) What is a species?

(2)

[Total: 2 marks]

Q25. Scientists study genetic information.

(a) What is the Human Genome Project?

(2)

[Total: 2 marks]

Higher Tier

Q26. DNA is the genetic material found in cells.

(a) Describe the structure of DNA.

(3)

(b) What is a gene?

(2)

[Total: 5 marks]

Q27. Scientists can now analyse DNA using the Human Genome Project. (a) State one benefit of the Human Genome Project.

(2)

(b) Give one ethical concern about genome analysis.

(2)

[Total: 4 marks]

Q28. Genetic inheritance is shown using genetic diagrams.

(a) What do the letters in a genetic diagram represent?

(1)

(b) A child inherits a recessive disorder. Both parents are carriers. Use a Punnett square to show how this is possible.

(3)

[Total: 4 marks]

Q29. Alleles determine characteristics.

(a) What is meant by the term "dominant allele"?

(2)

(b) Why might a person with one dominant allele and one recessive allele not show the recessive characteristic?

(2)

[Total: 4 marks]

Q30. Variation exists within species. (a) Give two causes of variation in organisms.

(2)

(b) Explain why identical twins may still show differences in characteristics.

(2)

[Total: 4 marks]

Q31. Evolution explains how species change over time. (a) What is meant by the term "evolution"?

(2)

(b) Describe the process of natural selection.

(3)

[Total: 5 marks]

Q32. Fossils provide evidence for evolution. (a) Describe how fossils are formed.

(3)

(b) Why is the fossil record incomplete?

(2)

[Total: 5 marks]

Q33. Selective breeding is used in agriculture. (a) What is selective breeding?

(2)

(b) Give one disadvantage of selective breeding.

(2)

[Total: 4 marks]

Q34. Genetic engineering changes an organism's genome. (a) Describe one benefit of genetic engineering.

(2)

(b) Give one risk of genetic engineering.

(2)

[Total: 4 marks]

Q35. Bacteria evolve quickly.

(a) Explain how bacteria can become resistant to antibiotics.

(3)

(b) Suggest how the spread of resistant bacteria in hospitals can be reduced.

(2)

[Total: 5 marks]

Q36. Extinction reduces biodiversity.

(a) What does extinction mean?

(1)

(b) State two reasons why a species might become extinct.

(2)

[Total: 3 marks]

Q37. Classification systems help organise species. (a) Name the scientist who developed the binomial system.

(1)

(b) Write the binomial name for humans.

(1)

(c) State one reason why classification systems change over time.

(1)

[Total: 3 marks]

Q38. Genetic engineering can be used in medicine. (a) Give one example of how genetic engineering is used in medicine.

(2)

(b) Why is gene therapy still experimental?

(2)

[Total: 4 marks]

Q39. Organisms show adaptations to their environment.

(a) What is an adaptation?

(2)

(b) Give one example of a structural adaptation in an animal.

(2)

[Total: 4 marks]

Q40. Mutations can lead to changes in organisms. (a) What is a mutation?

(2)

(b) Why do most mutations not affect an organism's phenotype?

(2)

[Total: 4 marks]

Triple Science Tier

Q41. A mutation occurs when the sequence of DNA bases is altered.

(a) What is a mutation?

(2)

(b) Describe how a mutation can affect the function of a protein.

(2)

[Total: 4 marks]

Q42. Scientists use genetic engineering to modify organisms.

(a) Describe one way genetic engineering is used in agriculture.

(2)

(b) Suggest one benefit and one risk of genetic engineering.
Benefit: _____

Risk: _____

(2)

[Total: 4 marks]

Q43. Selective breeding has been used for thousands of years.
(a) Explain the process of selective breeding in animals.

(3)

(b) Give one disadvantage of selective breeding.

(1)

[Total: 4 marks]

Q44. Fossils provide evidence for evolution.
(a) What is a fossil?

(2)

(b) Describe one way fossils can form.

(2)

[Total: 4 marks]

Q45. Charles Darwin proposed the theory of natural selection.
(a) State what is meant by the term 'natural selection'.

(2)

(b) Explain how natural selection leads to evolution.

(3)

[Total: 5 marks]

Q46. The human genome project has helped identify genes linked to disease.
(a) What is the genome of an organism?

(1)

(b) Give one benefit of mapping the human genome.

(2)

[Total: 3 marks]

Q47. There are different types of reproduction in organisms.
(a) State one difference between sexual and asexual reproduction.

(1)

(b) Suggest one advantage of asexual reproduction.

(2)

[Total: 3 marks]

Q48. Organisms show variation in characteristics.
(a) State two causes of variation.

(2)

(b) Explain how genetic and environmental factors can interact to affect human height.

(2)

[Total: 4 marks]

Q49. Inheritance is determined by genes carried on chromosomes.
(a) Where are chromosomes found in a cell?

(1)

(b) What is an allele?

(2)

[Total: 3 marks]

Q50. Some disorders are inherited.
(a) Name one disorder caused by a dominant allele.

(1)

(b) Describe how a carrier of a recessive allele can pass it to offspring.

(2)

[Total: 3 marks]

Q51. Meiosis is involved in the production of gametes.
(a) State one difference between mitosis and meiosis.

(1)

(b) Explain why gametes produced by meiosis are not genetically identical.

(2)

[Total: 3 marks]

Q52. Genetic diagrams help show inheritance patterns.
(a) Draw a Punnett square to show the cross between two heterozygous parents for a recessive disorder (use R and r).

(2)

(b) What is the probability that an offspring will be affected by the disorder?

(1)

[Total: 3 marks]

Q53. Genetic technologies are advancing rapidly.
(a) State one concern people have about genetic modification.

(1)

(b) Explain why some people support the use of genetic technology in medicine.

(2)

[Total: 3 marks]

Q54. Evolution results in new species forming over time.
(a) What is speciation?

(1)

(b) Describe how isolation can lead to speciation.

(3)

[Total: 4 marks]

Q55. Extinction is when a species no longer exists.
(a) Give two reasons why a species may become extinct.

(2)

(b) Explain why extinction can happen rapidly in changing environments.

(2)
[Total: 4 marks]