

Surname	Initial(s)
Signature	

Paper Reference(s)

5005 5025

Edexcel GCSE

Science (5005)

Biology (5025)

B1a – Topics 1 and 2

Foundation and Higher Tier

Friday 21 November 2008 – Morning

Time: 20 minutes

Materials required for examination

Multiple Choice Answer Sheet
HB pencil, eraser and calculator

Items included with question papers

Nil

Instructions to Candidates

Use an HB pencil. Do not open this booklet until you are told to do so.
Mark your answers on the separate answer sheet.

Foundation tier candidates: answer questions 1 – 24.

Higher tier candidates: answer questions 17 – 40.

All candidates are to answer questions 17 – 24.

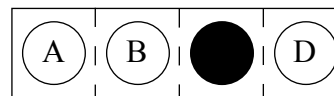
Before the test begins:

Check that the answer sheet is for the correct test and that it contains your candidate details.

How to answer the test:

For each question, choose the right answer, A, B, C or D
and mark it in HB pencil on the answer sheet.

For example, the answer C would be marked as shown.



Mark only **one** answer for each question. If you change your mind about an answer, rub out the first mark **thoroughly**, then mark your new answer.

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Turn over

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**Questions 1 to 16 must be answered by Foundation tier candidates only.
Higher tier candidates start at question 17.**

Genes

50% of the genes in a banana are the same as those in a human.



1. Genes are made of
 - A alleles
 - B chromosomes
 - C DNA
 - D gametes

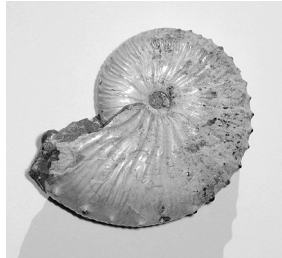
2. Where in the cell are chromosomes found?
 - A cell membrane
 - B cytoplasm
 - C chloroplast
 - D nucleus

3. HGP has found the position of every gene on each type of chromosome in the human body. What does HGP stand for?
 - A Human Growth Protein
 - B Human Genetic Products
 - C Human Genome Project
 - D Haploid Gene Project

4. What is a use of the information found by the HGP?
 - A genetic modification of plants
 - B DNA fingerprinting from a crime scene
 - C cloning of Dolly the sheep
 - D selective breeding of cattle

Fossils

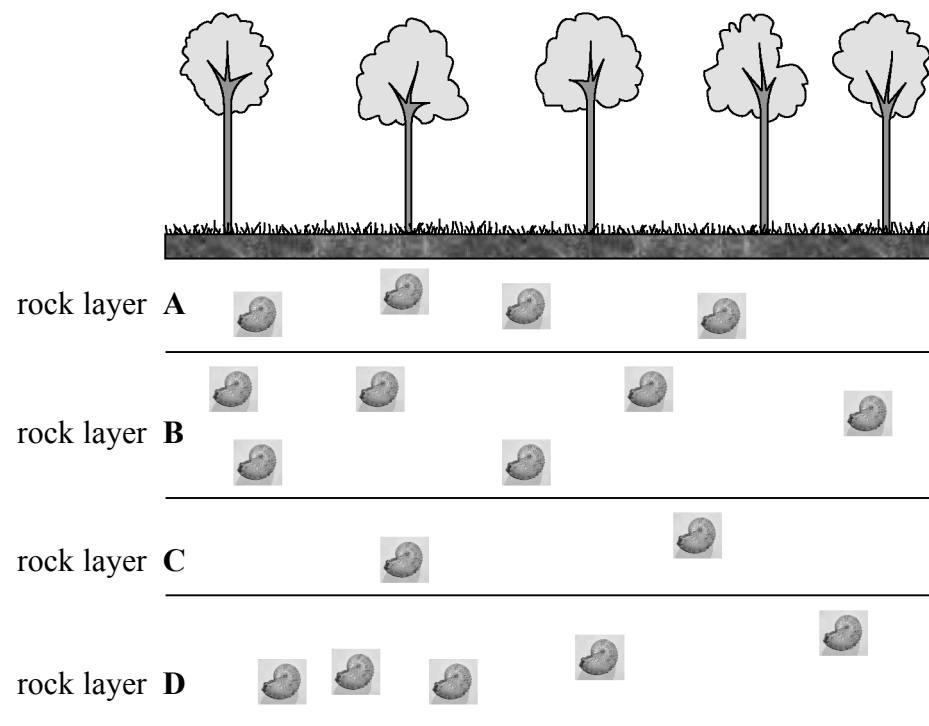
The size and shape of an ammonite fossil can be used to tell the age of a rock.



5. What is a fossil?
- A preserved remains of the hard parts of plants and animals
 - B living remains of the hard parts of plants and animals
 - C bones found in rocks
 - D pictures found on rocks

Use the diagram below to answer questions 6 and 7

Different layers of rock contain different numbers of fossils.

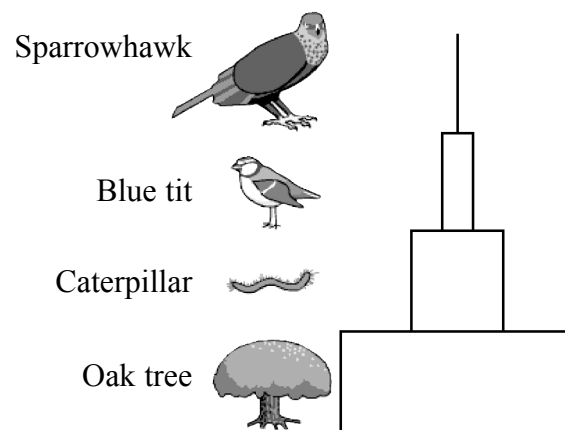


6. Which layer of rock contains the most fossils?
7. Which layer of rock is most likely to be the oldest?

8. Fossils provide evidence for evolution.
Evolution depends on
- A classification
 - B genetic engineering
 - C natural selection
 - D selective breeding

Food pyramids

Food chains can be shown as a pyramid.

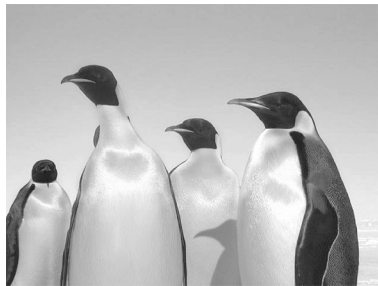


9. Which is the correct food chain for this pyramid?
- A sparrowhawk → blue tit → caterpillar → oak tree
 - B oak tree → caterpillar → blue tit → sparrowhawk
 - C sparrowhawk → caterpillar → blue tit → oak tree
 - D oak tree → blue tit → caterpillar → sparrowhawk
10. What is the producer in this pyramid?
- A blue tit
 - B caterpillar
 - C oak tree
 - D sparrowhawk
11. What type of pyramid is shown?
- A pyramid of biomass
 - B pyramid of animals
 - C pyramid of organisms
 - D pyramid of numbers

12. A large number of caterpillars were killed by spraying with an insecticide. What effect would this have on the blue tit population?
- A the number of blue tits would increase
 - B the number of blue tits would decrease
 - C the blue tits would eat more sparrowhawks
 - D more blue tits would nest in the oak tree

Penguin reproduction

Emperor penguins can only produce one egg per year.
Two parents are needed to successfully raise their offspring.
Penguins are well adapted to their environment and have characteristics that assist successful reproduction.



13. The survival of emperor penguins depends on
- A selective breeding
 - B producing more eggs
 - C successful reproduction
 - D mutations
14. A species which is less well adapted to its environment and cannot successfully reproduce will become
- A mutated
 - B extinct
 - C selectively bred
 - D fertilised
15. Reproduction which involves two parents is called
- A asexual reproduction
 - B variation
 - C cloning
 - D sexual reproduction

16. Which of the following organisms is most likely to reproduce asexually?



chimpanzee

A



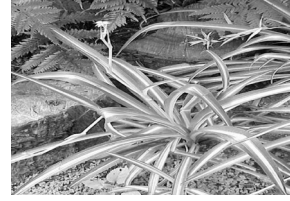
rose

B



shark

C



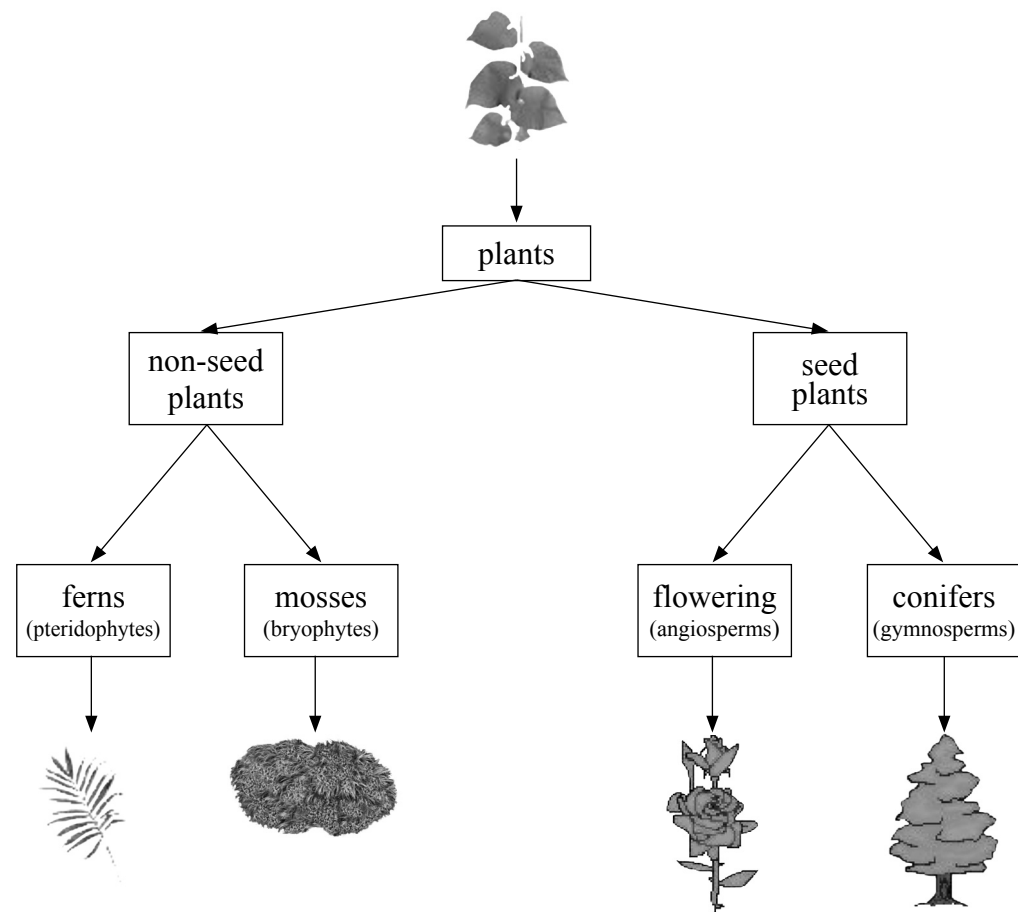
spider plant

D

Higher tier candidates start at question 17 and answer questions 17 to 40.
Questions 17 to 24 must be answered by all candidates: Foundation tier and Higher tier.

Plant and animal kingdoms

17. A system of plant classification is shown below.



The ferns are an example of a

- A kingdom
- B phylum
- C family
- D genus

18. Vertebrate animals such as humans can be named by their genus and species.
Which correctly names the genus and species of a human?

- A *Animalia homo*
- B *Homo sapiens*
- C *Sapien erectus*
- D *Animalia sapiens*

19. Put these classification terms in sequence, starting with the group with the most variation.

1. class
2. genus
3. phylum
4. species
5. family
6. order

- A** 3-1-6-5-2-4
B 4-2-5-6-1-3
C 3-1-5-6-2-4
D 4-2-6-5-1-3

20. The main characteristics of reptiles are that they

- A** give birth to live young and have dry scaly skin
B lay eggs and suckle their young
C give birth to live young and suckle their young
D lay eggs and have dry scaly skin

Predictions using computer models

A computer was programmed to model the effects of changing global temperatures on endangered animals.

It was found that as the global temperature increased more species became extinct.

21. The survival of a species in a changing environment is a result of

- A** intra-species competition
B selective breeding
C natural selection
D inter-species competition

22. Why was a computer used to model this rather than experimental evidence?

- A** computers are more accurate
B computers can give results faster
C experimental evidence cannot be proven
D experimental evidence is less reliable

23. Other factors, such as predator-prey relationships, can be modelled into the computer program.

What would be the effect of an increase of natural predators on the numbers of prey?

- A prey numbers would increase due to increased food supply
- B prey numbers would increase due to decreased predation
- C prey numbers would decrease due to decreased food supply
- D prey numbers would decrease due to increased predation

24. Computer modelling involves

	inputting data	using a set of rules	predicting future outcomes
A	yes	yes	yes
B	yes	no	yes
C	no	yes	no
D	no	no	yes

TOTAL FOR FOUNDATION TIER PAPER: 24 MARKS

Foundation tier candidates do not answer any more questions after question 24.

**Questions 25 to 40 must be answered by Higher tier candidates only.
Foundation tier candidates do not answer questions 25 to 40.**

Organic farming is on the increase in Britain

More and more supermarkets are stocking organic fruit and vegetables and organic ready made foods, meat and frozen products. However, the demand for Genetically Modified (GM) foods has reduced.

25. What is likely to be the main reason why consumers are buying more organic produce?

- A consumers are eating less fruit and vegetables
- B consumers are concerned about what is in the food they are eating
- C the price of organic foods is much lower than non-organic foods
- D the price of organic foods is too high due to production costs

26. Why are organic products generally more highly priced than non-organic products?

- A the cost of pesticides is high and more need to be used
- B organic fertilisers have a lower cost than chemical fertilisers
- C organic products have a lower yield than non-organic products
- D chemical fertilisers do not need to be used.

27. GM products are available in supermarkets.
What is a valid concern about the growing of GM crops?

- A growing GM crops may harm the natural ecosystem
- B growing GM crops always increases the amount of insecticide used
- C more fertilisers are needed to grow GM crops
- D GM products are poisonous to people when eaten in large quantities

28. To genetically modify crops, different genes have to be inserted into a crop plant.
Which row of the table is correct for the process of genetic modification?

	genes cut out using	genes inserted using
A	enzymes	hormones
B	enzymes	enzymes
C	hormones	enzymes
D	hormones	hormones

Smoking and genes

Scientists in America have found a link between low weight babies of mothers who smoke and the presence in the mother's body of mutated forms of two genes CYP1A1 and GSTT1. These genes code for enzymes which help to break down the products of smoking. Women with the mutated genes do not produce these enzymes and so the products of smoking affect the birth weight of their babies.

29. Which is a definition of mutation?

- A a feature which is always disadvantageous
- B a random change in the DNA sequence
- C a genetically modified organism
- D an inherited DNA sequence

30. Women who smoke and have the mutated CYP1A1 gene have babies with a low birth weight. Which row of the table shows the factors responsible for low birth weight babies in these women?

	environmental effects	gene therapy	inherited characteristics
A	yes	yes	no
B	no	no	yes
C	yes	no	yes
D	no	yes	no

31. Scientists are researching the production of designer babies. These designer babies would not carry any mutated genes. Why are some people opposed to this type of research?

- A designer babies will carry unknown diseases
- B designer babies do not live long, like Dolly the sheep
- C there are ethical concerns about experimenting on embryos
- D people with genetic diseases will not be able to have children

32. What is the name given to the combination of genes carried by an individual?

- A genotype
- B variation
- C phenotype
- D gamete

Plant and human growth

Growth is dependent on many factors.

The human population is growing taller because of a change in diet to one containing more meat.

Some plants are being cultivated to produce dwarf varieties which are able to grow in harsher conditions.

33. If the diet of the human population was meat only, this could cause a food shortage. This is because

A there are not enough plants to eat.
B meat does not contain all the nutrients humans need.
C energy is lost at each trophic level in a food chain.
D there is more energy in plant material than animal material.

34. The change in the human diet, to eat more meat, is a result of

A inherited characteristics only
B environmental conditions only
C both inherited characteristics and environmental conditions
D neither inherited characteristics nor environmental conditions

35. The dwarf variety of wheat has only recessive alleles for height. Two wheat plants, heterozygous for height, were bred together.

What percentage of the offspring would be dwarf wheat plants?

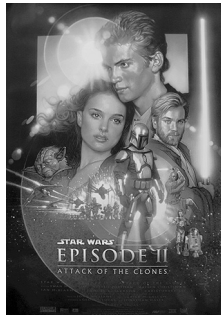
A 0%
B 25%
C 50%
D 100%

36. Plants need various mineral ions to grow effectively. These mineral ions can be absorbed from the soil.

The lack of nitrate ions will lead to

A rapid root growth
B young leaves lacking chlorophyll
C stunted growth
D poorly developed fruit

Attack of the clones



The Star Wars™ adventure films recently featured the idea of a cloned army of storm troopers who would fight for their masters.

Scientists have successfully cloned various animals although there are restrictions on cloning in different countries. The cloning of humans is not allowed in the UK.

37. What is cloning?

- A making identical copies of an individual by replicating a haploid cell
- B making non-identical copies of an individual using a diploid cell
- C making identical copies of an individual by replicating a diploid cell
- D making identical copies of an individual using the HGP

38. What is the most likely reason for the ban on the cloning of humans in the UK?

- A cloning is potentially dangerous to the person being cloned
- B cloning uses surrogate mothers and this is illegal
- C cloning of humans involves creating a new human artificially
- D cloning techniques are not understood sufficiently

39. These are two statements about cloning

- 1 Cloning could lead to the production of designer babies with unique features
- 2 An electric shock is needed to stimulate the fertilised ovum to divide

Which are true?

- A 1 only
- B 2 only
- C both 1 and 2
- D neither 1 nor 2

40. These are two statements about the production of cloned body organs

- 1 Human body organs could be grown on other animals which would cause the animals to be transgenic.
- 2 Human body organs, which are grown to replace defective organs, would not be rejected.

Which are true?

- A** 1 only
- B** 2 only
- C** both 1 and 2
- D** neither 1 nor 2

TOTAL FOR HIGHER TIER PAPER: 24 MARKS

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