

WESTMINSTER SCHOOL THE CHALLENGE 2015

BIOLOGY

Thursday 30 April 2015

Time allowed: 30 minutes

Please write in black or blue ink.

Write your answers in the spaces provided.

OFUS

For examiner use only

Total

Mark

Answer **all** the questions.

B1 Fig. 1.1 shows some notes pinned to a noticeboard in the office of a garden centre to remind staff of jobs that needed to be done.

A Cut off the anthers from the chilli plant flowers and pollinate these flowers with pollen from different chilli plants.

B Bring carnivorous ladybirds into the greenhouse to reduce the numbers of plant-eating pests.

C Keep lights and gas burners in greenhouses switched on overnight.

D Collect the pollen from geranium plants that are frost-resistant and use this pollen to pollinate other frost-resistant geranium plants.

E Add fertiliser to soil of plants growing in raised beds so all plants have access to mineral ions.

F Pin any trailing blackberry shoots onto the soil so that they grow roots and form new plants.

Fig. 1.1

Match the notes, **A** to **F**, with the biological principles on which they are based.

Write the correct letter next to the description of each principle.

Biological principle	Letter	
selective breeding		
minimising competition		
predator-prey interactions		
preventing inbreeding		
increasing the rate of photosynthesis		
asexual reproduction		[3]

B2	Cattle	Cattle farmers take care to ensure the livestock they raise have a suitable diet.		
	Sugg	est reasons for the following:		
	(a)	Cattle feed is often rich in protein.		
		[2]		
	(b)	The enzyme amylase is sometimes added to cattle feed.		
		[3]		
	(c)	Antibiotics are sometimes added to cattle feed.		
		[2]		

south	ern En	ne individuals of <i>Sciurus carolinensis</i> , the grey squirrel, were introduced to gland from the USA. Since then, the number and range of grey squirrels have nd the number and range of red squirrels have decreases dramatically.	
•	squirre red squ	els are larger, spend more time on the ground and are less frightened of people sirrels.	
(a)		gest why the introduction of the grey squirrel has reduced the number and range d squirrels.	
		[2	
(b)		numberland is one the few areas of England that still has a large population of equirrels.	
	In an attempt to preserve the population of red squirrels the government has funded a cull (trapping and killing) of grey squirrels in Northumberland.		
	(i)	Suggest two specific reasons why the government feels it is important to conserve red squirrels in particular areas, such as Northumberland.	
		1	
		2	
		[2]	
	(ii)	Some local residents have objected to the culling of grey squirrels.	
		Give one reason why people might disagree with the culling of grey squirrels.	
		[1]	

At the beginning of the nineteenth century, one species of squirrel, Sciurus vulgaris, the red

В3

squirrel, inhabited Great Britain.

(c)	Environmental groups have asked members of the public to report sightings of grey and red squirrels. In some parts of Northumberland, the reported number of sightings of grey squirrels is higher than that of red squirrels.		
	(i)	Suggest two reasons why the actual number of grey squirrels might not be higher than the actual number of red squirrels.	
		1	
		2	
		[2]	
	(ii)	Outline how you would go about estimating the population of grey and red squirrels in one woodland.	
		[4]	

A study was carried out on a large number of people, some of whom were smokers. The study investigated the link between percentage of deaths due to lung cancer in smokers and their smoking habits. The age at which they started smoking and the number of cigarettes smoked per day were recorded. The results of the study are shown in Fig. 4.1.

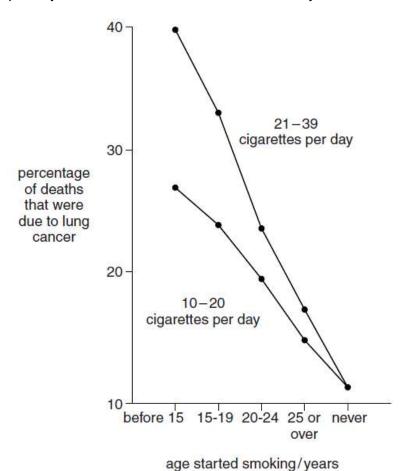


Fig. 4.1

(a)	Explain what the results in Fig. 4.1 show about the link between cigarette smoking and percentage of deaths due to lung cancer.		
		ıa	

(b)	Complete the following paragraph by inserting appropriate terms.	
	Lung cancer can be caused by chemicals present in tar called carc	inogens. When a
	smoker inhales tobacco smoke, the tar present in the smoke sticks	to the ciliated
	cells in the gas exchange system.	The carcinogens
	diffuse through the cell surface of	the cells and bind
	to the present in the nucleus. In the	e nucleus the
	carcinogens can cause a mutation that leads to the cells dividing ou	ut of control,
	forming a mass of cells called a tumour.	[3]
(c)	Suggest two factors, other than number of cigarettes smoked at might increase the likelihood of death from lung cancer.	nd age , which
	1	
	2	[2]
(d)	Explain why smoking tobacco can lead to breathing difficulties.	
(e)	The molecule nicotine is present in tobacco smoke and can affect t the fetus in a pregnant woman.	he development of
	Explain how nicotine is transported from the lungs of a pregnant sm	noker to her fetus.
		[2]
		[Total: 33]

END OF BIOLOGY SECTION

