cookie

Practice paper

GCSE Biology Higher, practice paper 2 (AQA style)

In the style of AQA GCSE Biology (8461) Paper 2 Higher

Practice paper written by cookie in the style of AQA GCSE Biology (8461) Paper 2 Higher. Not an AQA paper; not affiliated with or endorsed by AQA.

Time allowed: 1 hour 45 minutes

Total marks: 100

Name _____

Instructions

- Answer all questions in the spaces provided.
- The maximum mark for this paper is 100. The marks for each question are shown.
- You may use a calculator.
- Show your working in calculations: you may get marks for a correct method even if your final answer is wrong.
- For multiple-choice questions, choose one answer only.
- In questions marked 6, you will be assessed on your ability to write a clear, logically ordered answer using correct scientific terms.
- This paper covers Homeostasis and response; Inheritance, variation and evolution; and Ecology.

Information

- The marks for each question are shown in brackets.
- The maximum mark for this paper is 100.

Do it online, timed and marked:
cookie.education/past-papers/gcse/cookie/biology-aqa-style

Answer all questions in the spaces provided.

0 1 This question is about the nervous system and the eye.

0 1 . 1 What is the name of the gap between two neurones?

A Axon ☐

B Effector ☐

C Receptor ☐

D Synapse ☐

[1 mark]

0 1 . 2 A person touches a hot pan and moves their hand away before they feel any pain. This is a reflex action. Describe the pathway taken by nerve impulses in this reflex action.

[3 marks]

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0 1 . 3 A student investigated reaction time with the ruler-drop test. A partner held a ruler with the zero mark between the student's open finger and thumb, then dropped it without warning. The student caught the ruler as quickly as possible and read the distance the ruler fell. The table shows the student's five results. Identify the anomalous result.

Trial	**1**	**2**	**3**	**4**	**5**
Distance ruler fell (cm)	12	15	11	26	14

[1 mark]

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0 1 . 4 Calculate the mean distance the ruler fell. Do not include the anomalous result.

[2 marks]

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0 1 . 5 The student then looked up from the ruler to read a poster on the far wall of the room, and back again. Explain how the eye focuses on a near object such as the ruler.

[3 marks]

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0 2 This question is about hormones and the control of blood glucose concentration.

0 2 . 1 Which gland produces thyroxine?

A Adrenal gland ☐

B Ovary ☐

C Pituitary gland ☐

D Thyroid gland ☐

[1 mark]

0 2 . 2 After a meal, the concentration of glucose in a person's blood rises. Describe how the body brings the blood glucose concentration back to normal.

[3 marks]

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0 2 . 3 Later, the person's blood glucose concentration falls below normal. Explain how the body responds to this.

[2 marks]

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0 2 . 4 Give one difference between the cause of Type 1 diabetes and the cause of Type 2 diabetes, and one difference between how they are treated.

[2 marks]

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0 2 . 5 The number of adults with Type 2 diabetes in a town rose from 3200 in 2015 to 4100 in 2025. Calculate the percentage increase in the number of adults with Type 2 diabetes. Give your answer to 3 significant figures.

[2 marks]

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0 3 This question is about the kidneys and water balance.

0 3 . 1 In which organ is urea produced?

A Bladder ☐

B Kidney ☐

C Liver ☐

D Pancreas ☐

[1 mark]

0 3 . 2 Describe how the kidneys produce urine.

[3 marks]

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0 3 . 3 A runner loses a lot of water by sweating on a hot day. Explain how the body reduces the volume of water lost in the runner's urine.

[3 marks]

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0 3 . 4 Each day the kidneys of an adult filter 180 dm^3 of fluid from the blood. 99.2% of this volume is reabsorbed back into the blood. The rest leaves the body as urine.
Calculate the volume of urine produced each day. Give your answer in cm^3. (1 dm^3 = 1000 cm^3)

[2 marks]

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0 4 This question is about hormones in human reproduction.

0 4 . 1 Which hormone causes an egg to be released from an ovary?

A FSH ☐

B LH ☐

C Oestrogen ☐

D Progesterone ☐

[1 mark]

0 4 . 2 Name the gland that produces FSH and give one effect of FSH.

[2 marks]

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0 4 . 3 Explain how a progesterone implant prevents pregnancy.

[2 marks]

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0 4 . 4 The table shows how many women out of every 100 become pregnant in one year using each method. A clinic has 2500 women who use condoms as their only method of contraception. Calculate how many of these women would be expected to become pregnant in one year.

Method of contraception	Pregnancies per 100 women in one year of typical use
Condom	13
Combined pill	7
Progesterone implant	0.1

[2 marks]

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0 4 . 5 Some couples cannot have a baby. In vitro fertilisation (IVF) treatment may help them. Describe how IVF is carried out and evaluate the use of IVF.

[6 marks]

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0 5 This question is about plant hormones.

0 5 . 1 Which plant hormone is used to control the ripening of fruit during storage and transport?

A Auxin ☐

B Ethene ☐

C Gibberellin ☐

D Insulin ☐

[1 mark]

0 5 . 2 Give one use of gibberellins.

[1 mark]

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0 5 . 3 A student grew cress seedlings in a box with a light shining in from one side only. The shoots grew towards the light. Explain why.

[3 marks]

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0 5 . 4 In roots, auxin inhibits cell elongation. A seedling root is placed so that it lies horizontally. Explain why the root grows downwards.

[2 marks]

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0 5 . 5 The student measured the shoot length of five seedlings at the start (day 0) and after 5 days. The table shows the results. Calculate the mean increase in shoot length.

Seedling	**A**	**B**	**C**	**D**	**E**
Shoot length on day 0 (mm)	3	4	3	5	4
Shoot length on day 5 (mm)	23	27	25	31	24

[2 marks]

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0 6 This question is about inheritance.

0 6 . 1 How many chromosomes are there in a normal human egg cell?

A 23 ☐

B 46 ☐

C 23 pairs ☐

D 46 pairs ☐

[1 mark]

0 6 . 2 Give two differences between cell division by meiosis and cell division by mitosis.

[2 marks]

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0 6 . 3 Cystic fibrosis is an inherited disorder of cell membranes caused by a recessive allele, f. The dominant allele is F. Two parents are both carriers of cystic fibrosis (Ff). Use a Punnett square to find the probability that their first child will have cystic fibrosis.

[3 marks]

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0 6 . 4 The parents could have IVF and embryo screening, so that only embryos without cystic fibrosis are put into the mother's uterus. Give one argument for and one argument against embryo screening.

[2 marks]

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0 6 . 5 A couple already have three daughters. What is the probability that their next child will be a boy?

[1 mark]

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0 6 . 6 Give one reason why understanding the human genome is important in medicine.

[1 mark]

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0 7 This question is about evolution and classification.

0 7 . 1 Carl Woese proposed the three-domain system of classification. Which of these is one of the three domains?

A Archaea ☐

B Fungi ☐

C Plants ☐

D Protists ☐

[1 mark]

0 7 . 2 The binomial name of the dog rose is Rosa canina. Give the genus of the dog rose.

[1 mark]

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0 7 . 3 Some strains of bacteria are resistant to antibiotics. Explain how a strain of bacteria that is resistant to an antibiotic develops, and describe what doctors and farmers can do to slow down the development of resistant strains.

[6 marks]

0 7 . 4 The number of infections caused by one resistant strain of bacteria in a country rose from 1240 in 2016 to 1860 in 2024. Calculate the percentage increase in the number of these infections.

[2 marks]

0 7 . 5 Evidence for evolution comes from fossils. Give one reason why there are very few fossils of the earliest forms of life.

[1 mark]

0 7 . 6 Bacteria can be genetically engineered to produce human insulin. Describe how this is done.

[3 marks]

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0 8 This question is about sampling a habitat. Some students wanted to estimate the number of daisy plants in a field. The field is a rectangle 50 m long and 80 m wide. The students counted the daisies in ten 0.25 m^2 quadrats. The table shows their results.

Quadrat	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Number of daisies	3	6	4	0	7	5	2	8	6	5

0 8 . 1 Which of these is an abiotic factor that could affect the number of daisies in the field?

A Competition from grasses ☐

B Light intensity ☐

C Grazing by rabbits ☐

D A disease of daisies ☐

[1 mark]

0 8 . 2 Describe how the students should have placed their quadrats and collected their data so that the estimate is valid.

[3 marks]

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0 8 . 3 Use the data in the table to estimate the number of daisies in the field.

[3 marks]

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0 8 . 4 The students then used a transect line from the trunk of a large tree out into the field. They measured the percentage cover of grass and the light intensity at intervals along the line. The table shows their results. Describe the pattern in the percentage cover of grass.

Distance from tree trunk (m)	**0**	**2**	**4**	**6**	**8**	**10**
Light intensity (arbitrary units)	150	300	600	1100	1400	1450
Percentage cover of grass	5	10	25	55	80	85

[2 marks]

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0 8 . 5 Suggest two reasons why there is less grass close to the tree.

[2 marks]

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0 9 This question is about decay, cycles and biomass.

0 9 . 1 Which process removes carbon dioxide from the atmosphere?

A Combustion ☐

B Photosynthesis ☐

C Respiration ☐

D Decay ☐

[1 mark]

0 9 . 2 A student investigated the effect of temperature on the rate of decay of fresh milk. The student mixed milk, sodium carbonate solution and the enzyme lipase with phenolphthalein indicator. The mixture was pink. Lipase breaks down lipids in the milk into fatty acids and glycerol. As fatty acids are produced the pH falls and the indicator turns colourless. The student timed how long the mixture took to turn colourless at different temperatures. The table shows the results. Calculate the rate of reaction at 25 °C, using: rate = 1000 ÷ time. Give your answer to 2 significant figures.

Temperature (°C)	**15**	**25**	**35**	**45**	**55**
Time to turn colourless (s)	600	320	150	210	no change after 900 s

[2 marks]

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0 9 . 3 Explain the results in the table.

[3 marks]

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0 9 . 4 In a grassland ecosystem the biomass of the producers is 2400 g per m^2 and the biomass of the primary consumers is 216 g per m^2. Calculate the efficiency of biomass transfer from the producers to the primary consumers.

[2 marks]

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0 9 . 5 Give two reasons why not all the biomass of the producers is transferred to the primary consumers.

[2 marks]

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0 9 . 6 Peat bogs are being drained so that the land can be used for farming, and the peat is dug up to be sold as garden compost. Explain the effects of this on the atmosphere and on biodiversity.

[4 marks]

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END OF QUESTIONS