

AS Level Biology B

H022/01 Foundations of biology

Multiple Choice Questions

Question Set 18

- 1** During a routine visit to the antenatal clinic, a woman in the early stages of pregnancy was offered advice about why she should increase her intake of certain nutrients.

Which of the following nutrients, **A** to **D**, should be increased for synthesis of DNA and production of erythrocytes?

- A** iron
- B** folic acid
- C** calcium
- D** vitamins A and C

Your answer

[1]

- 2** DNA barcodes are sequences of DNA that can be used for identifying species.

Which of the statements, **A** to **D**, is a property of a DNA barcode that make ideal for identifying species?

- A** shows a large amount of variation between species
- B** shows a large amount of variation within a species
- C** is long, so quick to analyse
- D** is found in the mitochondria of most taxa

Your answer

[1]

- 3** Which of the options, **A** to **D**, accurately describes a clinical trial in which neither the patients nor the scientists know which treatment is being issued?

- A** placebo
- B** double-blind
- C** randomised
- D** blind

Your answer

[1]

4

The table below shows the results of a survey investigating asthma in children from an urban population of China in 2010.

	Males	Females
Number in population	6096	5986
Number with asthma	352	199

Which of the options, **A** to **D**, is the correctly calculated percentage prevalence rate of asthma in this population of children?

- A** 5.7%
- B** 3.3%
- C** 5.5%
- D** 4.6%

Your answer

[1]

5

HER-2/neu is a type of gene that produces a protein involved in regulating the normal growth of breast cells.

A mutation in the *HER-2/neu* gene causes large quantities of this protein to be produced which leads to the development of breast cancer.

Which of the statements, **A** to **D**, is correct?

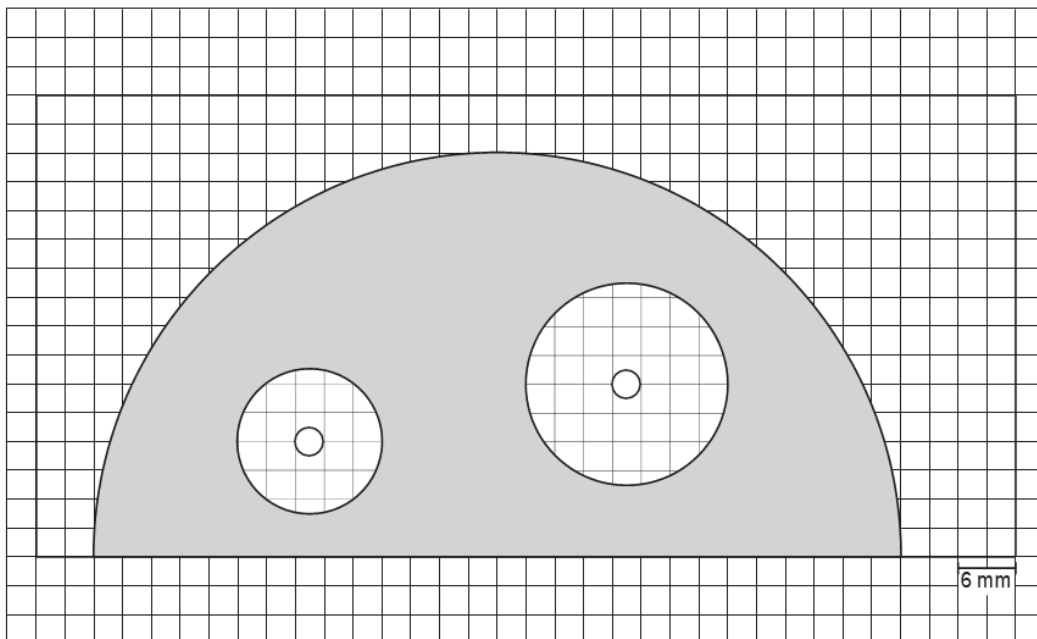
- A** *HER-2/neu* is a proto-oncogene that becomes an oncogene when it is mutated.
- B** *HER-2/neu* is a tumour suppressor gene that becomes an oncogene when it is mutated.
- C** *HER-2/neu* is an oncogene that becomes a proto-oncogene when it is mutated.
- D** *HER-2/neu* is a tumour suppressor gene that becomes a proto-oncogene when it is mutated.

Your answer

[1]

- 6 A group of students was investigating the effect of different antibiotics on the growth of colonies of the bacterium, *Escherichia coli*.

The results are shown below.



Which of the options, **A** to **D**, is the inhibition zone of the **least effective** antibiotic?

- A 1385 mm²
- B 707 mm²
- C 346 mm²
- D 177 mm²

Your answer

[1]

- 7 Embryonic stem cells can be used in cell replacement therapies. Embryonic stem cells can differentiate into any type of body cell but cannot form a whole organism.

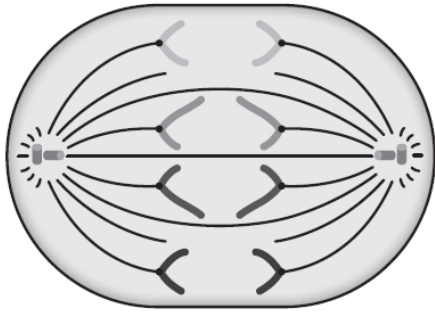
Which of the options, **A** to **D**, is the type of stem cell being described?

- A pluripotent
- B totipotent
- C unipotent
- D multipotent

Your answer

[1]

- 8 The diagram below shows a cell during cell division. The diploid number of this cell is four.



Which of the options, **A** to **D**, is correct?

- A** the cell is in telophase 1 of meiosis
- B** the cell is in telophase of mitosis
- C** the cell is in anaphase of mitosis
- D** the cell is in anaphase 1 of meiosis

Your answer

[1]

- 9 Chromosome mutations can cause syndromes such as Down's syndrome.

Which of the options, **A** to **D**, is the correct chromosome content in the cells of a male with Down's syndrome?

- A** 47 chromosomes, XXY
- B** 47 chromosomes, XY
- C** 45 chromosomes, OY
- D** 45 chromosomes, XY

Your answer

[1]

10 Which of the options, **A** to **D**, is a primary defence mechanism against pathogens?

- A antibody molecules
- B the HPV vaccine
- C lysozyme, an enzyme found in saliva and tears
- D penicillin, an antibiotic

Your answer

[1]

11 The number of chromosomes in a developing fetus can be checked by producing a karyogram.

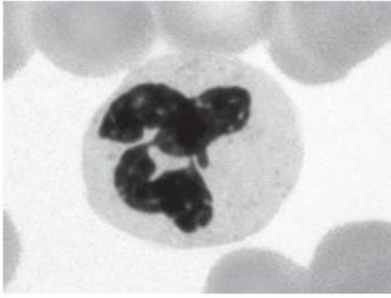
Which of the options, **A** to **D**, about the production of a karyogram is **not** correct?

- A fetal cells can be extracted from the placenta
- B fetal cells are stimulated to divide by meiosis
- C a chemical is added to stop cell division in metaphase
- D the chromosomes are stained and photographed

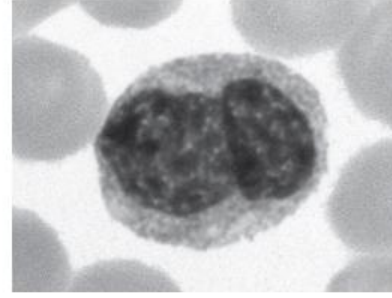
Your answer

[1]

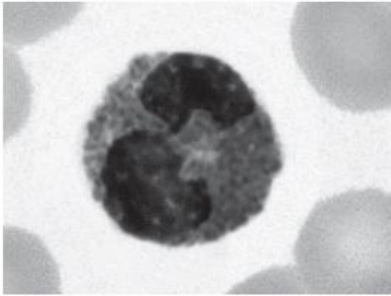
12 The photomicrographs show different types of leucocyte (white blood cell).



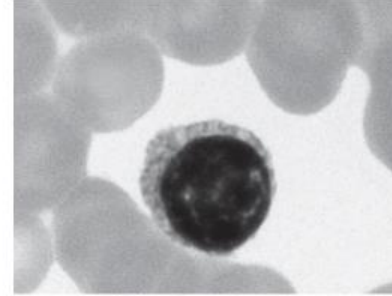
leucocyte A



leucocyte B



leucocyte C



leucocyte D

Which of the leucocytes, **A** to **D**, can differentiate into a plasma cell during the specific immune response?

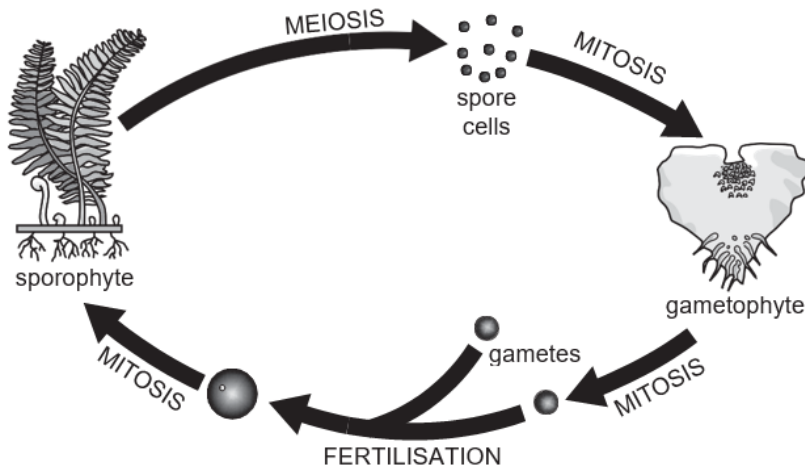
Your answer

[1]

13

Plant life cycles show alternation of generations. The term alternation of generations is used to describe a process whereby mitosis and meiosis occur and the plant alternates between haploid and diploid forms during its life cycle.

Alternation of generations in the life cycle of a fern (*Polypodium* species) is shown in the diagram below.



Which of the rows, **A** to **D**, is correct?

	Sporophyte	Gametophyte	Spore cell	Gamete
A	diploid	haploid	haploid	haploid
B	haploid	diploid	haploid	haploid
C	diploid	haploid	diploid	diploid
D	diploid	diploid	haploid	haploid

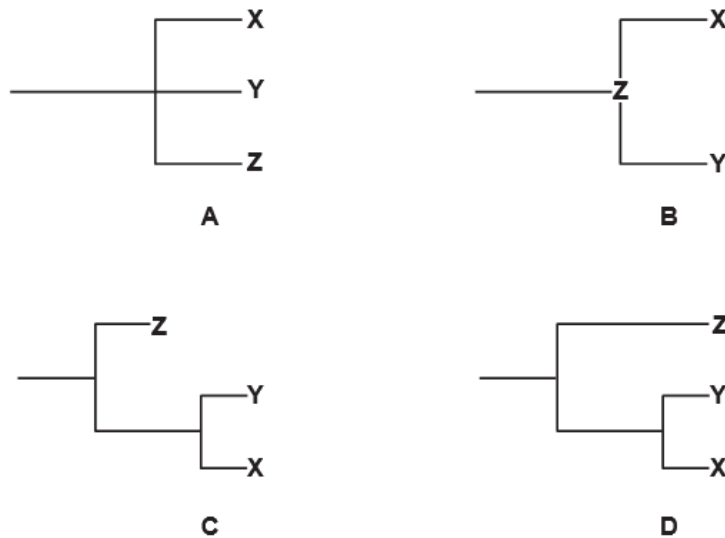
Your answer

[1]

14

Three species, **X**, **Y** and **Z**, all evolved from a common ancestor. Species **X** and **Y** were the most closely related and species **Z** was extinct.

Which of the phylogenetic trees, **A** to **D**, represents the evolution of species **X**, **Y** and **Z**?

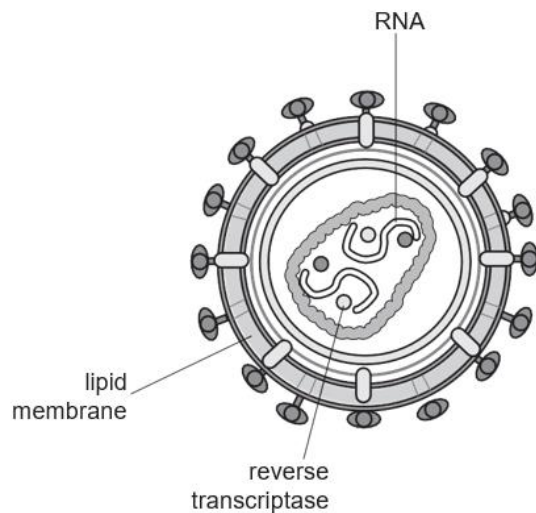


Your answer

[1]

15

The diagram shows a type of pathogen that can cause disease in humans.



Which of the statements, **A** to **D**, correctly describes its mechanism of pathogenicity?

- A** damages host cells by using them to make its own proteins rather than host protein
- B** produces agglutinins that clump host cells together
- C** secretes enzymes that enable it to spread through host tissues
- D** produces antibodies against host cells

Your answer

[1]

- 16** The following information describes a screening technique that can be used for detecting breast cancer:
- The patient must first be injected with a radioactive tracer.
 - The scanner detects gamma radiation.
 - The coloured images produced show differences between healthy and cancerous tissue.

Which of the screening techniques, **A** to **D**, is being described?

- A** Magnetic resonance imaging (MRI)
- B** Mammography
- C** Positron emission tomography (PET)
- D** Computerised tomography (CT)

Your answer

[1]

- 17** Carbapenems are a class of broad-spectrum antibiotics.

In recent years, there has been an increase in the number of carbapenem-resistant strains of bacteria.

Which of the statements, **A** to **D**, would contribute to an increase in the number of carbapenem-resistant strains of bacteria?

- A** some bacteria develop immunity to carbapenems
- B** increased use of carbapenems in animal feed to prevent infection
- C** increased use of carbapenems causes mutations in the bacteria
- D** some bacteria have plasmids containing genes for carbapenems

Your answer

[1]

- 18** During her first antenatal appointment, a woman was advised that she needed to increase her current Dietary Reference Value (DRV) energy intake from 7800 KJ to 9200 KJ.

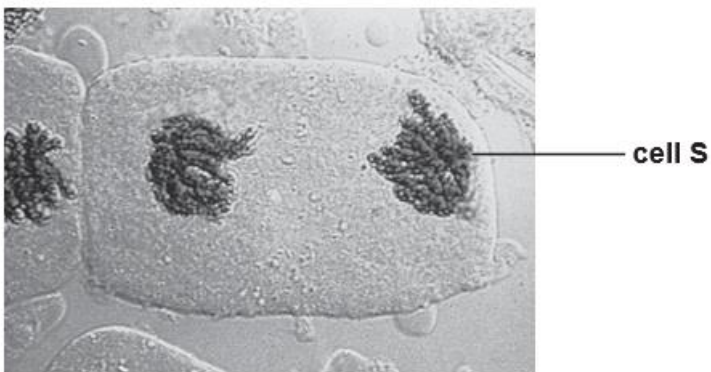
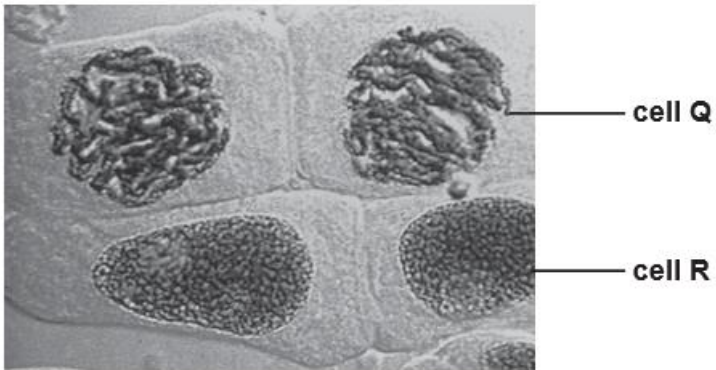
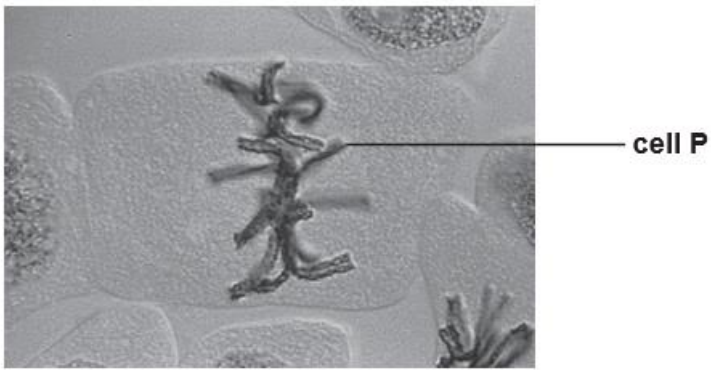
Which of the options, **A** to **D**, shows the correctly calculated percentage increase in DRV energy intake?

- A** 85%
- B** 118%
- C** 15%
- D** 18%

Your answer

[1]

19 The photomicrographs show plant cells in different stages of the cell cycle.



Which of the rows, **A** to **D**, correctly identifies the stages of the cell cycle occurring in the cells?

	Cell P	Cell Q	Cell R	Cell S
A	metaphase	interphase	telophase	anaphase
B	anaphase	prophase	interphase	telophase
C	metaphase	prophase	interphase	telophase
D	metaphase	interphase	prophase	anaphase

Your answer

[1]

20 Living organisms are classified by biologists in hierarchical groupings called taxonomic ranks.

After domain and kingdom, which of the options, **A** to **D**, is the correct sequence for these ranks?

A phylum, order, class, family, genus, species

B phylum, class, order, family, genus, species

C phylum, order, family, class, genus, species

D phylum, class, family, order, genus, species

Your answer

[1]

21 Which of the options, **A** to **D**, are molecules that enhance phagocytosis by marking antigens during an immune response?

A cytokines

B agglutinins

C anti-toxins

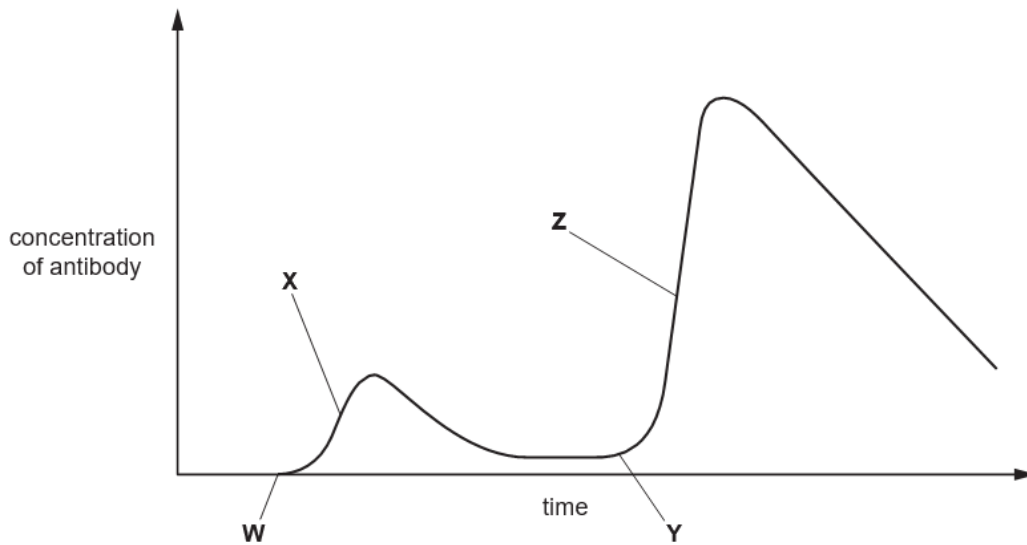
D opsonins

Your answer

[1]

22 Vaccination can provide immunity to infectious diseases.

The graph below shows an immune response for a person who has been vaccinated against an infectious disease.



Which of the options, **A** to **D**, describes what is happening during this immune response?

- A** At **W** the person was first exposed to the pathogen and at **X** the person was vaccinated.
- B** At **X** the person is producing a primary response to the vaccine and at **Z** the person is producing a primary response to the same antigen as that found in the vaccine.
- C** At **W** the person was vaccinated and at **Z** the person is producing a secondary response to the same antigen as that found in the vaccine.
- D** At **X** the person was vaccinated and at **Y** the person is producing a secondary response to the same antigen as that found in the vaccine.

Your answer

[1]

23 Cromolyn is a medicinal drug derived from plants. It has properties that make it useful in the treatment of asthma.

Which of the options, **A** to **D**, describes a property that would be most useful for the treatment of asthma?

- A** inhibits mitosis
- B** is antibacterial
- C** acts as a painkiller
- D** acts as a relaxant of smooth muscle

Your answer

[1]

Total Marks for Question Set 3: 23

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