

A Level Biology A
H420/01 Biological Processes

Question Set 4

4 (a)

Sperm cells in animals are formed by a process known as spermatogenesis. Fig. 19.1 is a summary of the process of spermatogenesis.

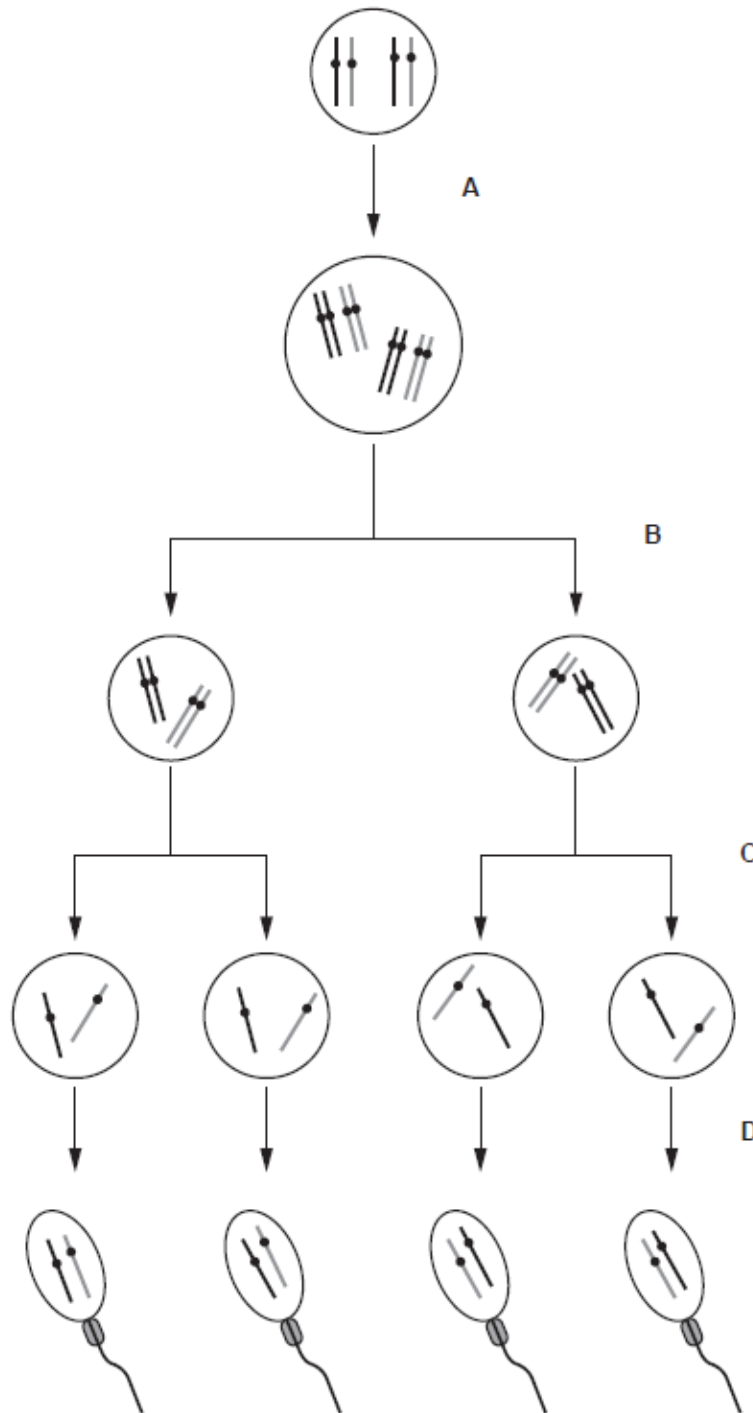


Fig. 19.1

Three phases of meiosis are listed below.

Match each phase of meiosis to a letter on Fig. 19.1.

Metaphase 1 occurs during the stage labelled

Telophase 2 occurs during the stage labelled

Anaphase 1 occurs during the stage labelled

[3]

4 (b)

The chromosomes carried by sperm are made of DNA.

The following passage about nucleic acids has four words missing. Choose the correct missing words from the list below and complete the passage by writing them in the gaps.

pentose nucleus adenosine hydrolysis
spiral polymers nucleotide
fibres hexose
 phosphate strands base two

Nucleic acids are made frommonomers.

Phosphodiester bonds form between the monomers. They consist of a
..... group between the.....molecules,
forming the 'backbone' of the molecule.

In DNA, hydrogen bonding between the two antiparallel
causes the characteristic double helix shape.

[4]

- 4 (c) (i) Fig. 19.2 is a transverse section of a sperm cell. The mitochondria of sperm cells form a spiral around the central flagellum.

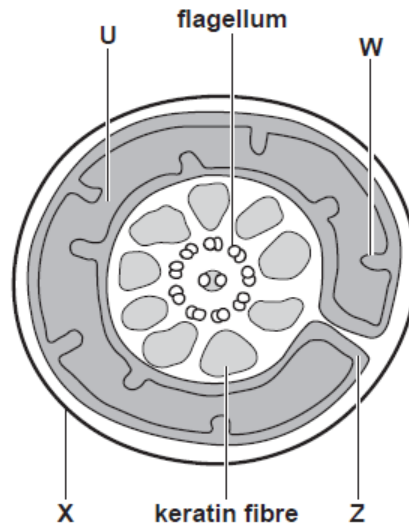


Fig. 19.2

Identify the structures labelled with the following letters:

U

W

Z

[3]

- 4 (c) (ii) ATP, FADH_2 and hexose 1,6-bisphosphate are three organic products of respiration in sperm cells.

Table 19 shows how the production of ATP, FADH_2 and hexose 1,6-bisphosphate in sperm cells is affected by three different substances.

Substance	Organic products of respiration per sperm cell		
	ATP ($10^{-10} \text{ mol s}^{-1}$)	FADH_2 ($10^{-11} \text{ mol s}^{-1}$)	Hexose 1,6- bisphosphate ($10^{-11} \text{ mol s}^{-1}$)
Cyanide	2.54	0.00	5.78
Fluoride	0.00	0.00	0.00
Sucrose	6.89	2.53	5.42

Table 19

What can be concluded about the difference between the effects of **cyanide** and **fluoride** on respiration in sperm?

[1]

Total Marks for Question Set 4: 11

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