

## **AS Level Biology B**

**H022/02** Biology in depth

### **Question Set 7**

- 1 The yellow fever mosquito, *Aedes aegypti*, is one of the vectors responsible for transmitting pathogenic viruses such as the Zika virus.

Fig. 1 is a diagram of a cell from *A. aegypti* during prophase of mitosis.

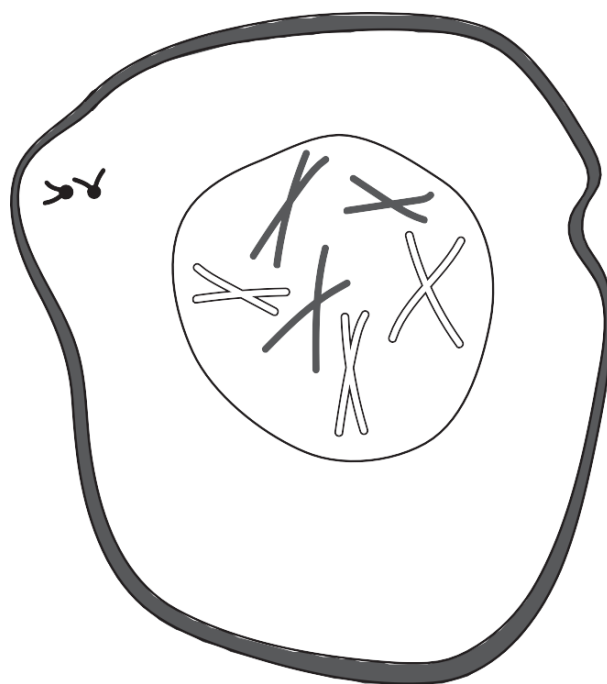
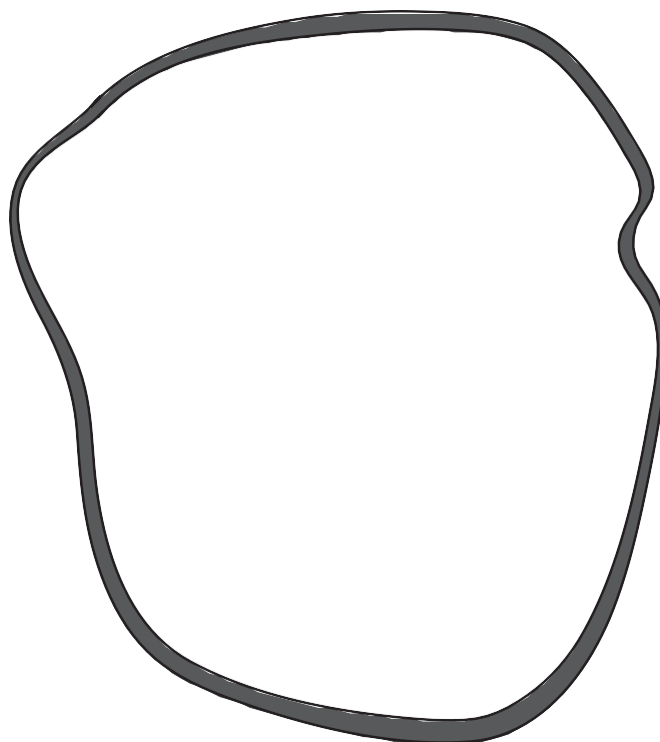


Fig. 1

- (a) (i) Using the information in Fig. 1 complete and label the diagram in the space below to show the cell during **metaphase** of mitosis.



(ii) Using Fig. 1 state the number of chromosomes that would be found in the following cells taken from *A. aegypti*.

A stem cell .....

A sperm cell (gamete) ..... [1]

(iii) Cells that develop mutations in DNA during the cell cycle can be destroyed to prevent the replication of damaged cells.

Name the process by which damaged cells are destroyed. [1]

(b) After fertilisation, female mosquitoes lay their eggs directly into the external environment.

Suggest **one** disadvantage to the embryo of developing inside eggs laid into the external environment.

[1]

(c)\* Stem cells removed from *A. aegypti* embryos have been used in scientific research to develop potential strategies for limiting the transmission of the Zika virus.

Discuss the potential uses for **human** embryonic stem cells taking into account any concerns that could arise by using these cells for research purposes.

[6]

**Total Marks for Question Set 7: 12**

---

# OCR

Oxford Cambridge and RSA

## Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website ([www.ocr.org.uk](http://www.ocr.org.uk)) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge