KING'S COLLEGE, BUDO
BIOLOGY – DEPARTMENT

SENIOR FIVE HOME ASSIGNMENT

1. (a) Explain the role of meiosis and mitosis in sexual reproduction. (05 marks)

   (b) Discuss the mechanisms of asexual reproduction in each of the following organisms (20 marks)

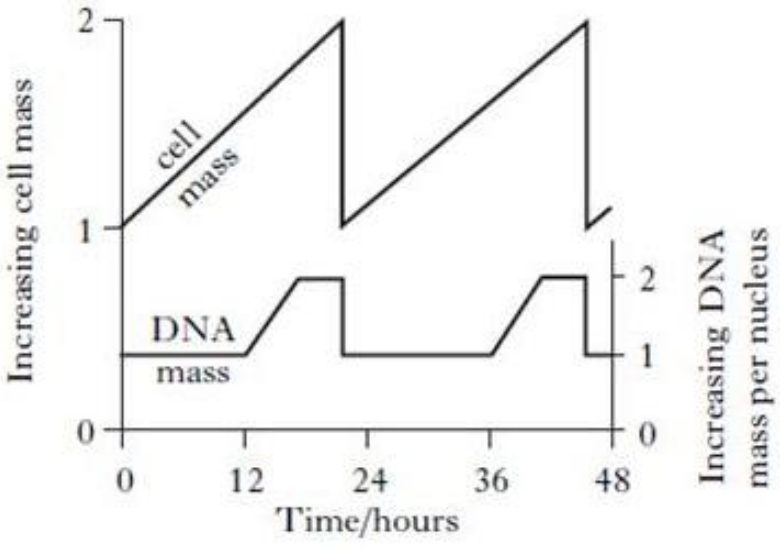
   (i) Plasmodium
   (ii) Spirogyra
   (iii) Bacterium
   (iv) Paramecium
   (v) Onion

2. (a) Describe the structure of a mature ovule (05 marks)
   (b) Describe the development of a mature ovule (10 marks)
   (c) Outline the strategies plants employ to prevent self pollination (05 marks)

3. (a) Outline the importance of a lifecycle that exploits the alternation of generations (05 marks)

   (b) Compare the life cycle of a moss with that of a fern (15 marks)

4. The figure below shows changes in the quantities of nuclear DNA and cell mass during repeated cell cycle.



(a) For one cell cycle only, describe the changes in:

(i) Mass of DNA **(02½ marks)**

(ii) Cell mass **(01½ marks)**

(b) For one cell cycle only, explain the trend in:

(i) Mass of DNA **(08 marks)**

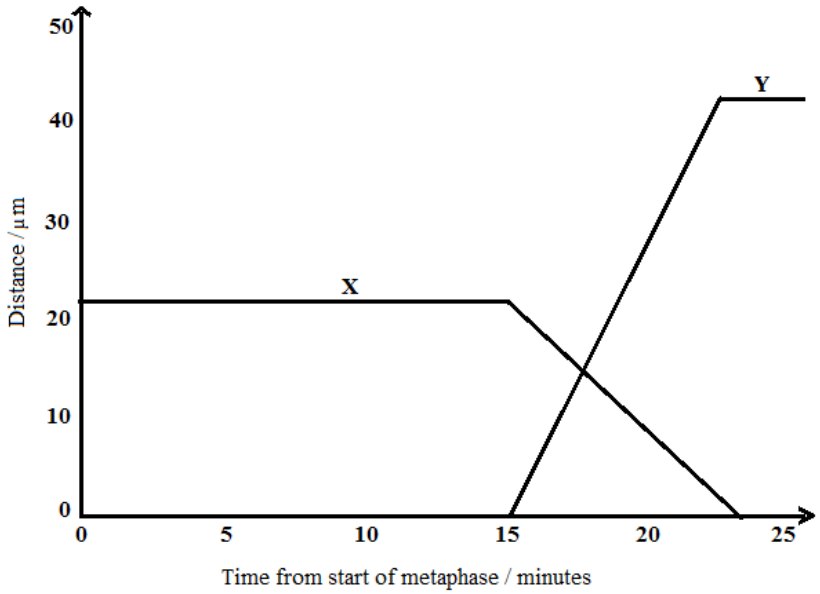
(ii) Cell mass (08 marks)

(c) Explain the significance of the observed changes in mass of DNA from 12 hours to about 23 hours. **(01 mark)**

5. In **figure** below, the graphs represent changes during mitosis in the distance between:

(i) Centromeres of chromatids and pole of the cell.

(ii) Centromeres of sister chromatids.



(a) Identify what curves X and Y represent **(01 mark)**

(b) Explain the trend in distance represented by:

(i) Curve X **(08 marks)**

(ii) Curve Y **(07 marks)**

(c) Explain the variation in the maximum distance achieved in X and Y **(03 marks)**

6 (a)(i) Outline the differences between prokaryotic cells and eukaryotic cells

(ii) Describe any evidence that suggests that eukaryotic cells evolved from prokaryotic cells.

(b) Describe the process of translation in a eukaryotic cell.

7. (a) Describe the three- dimensional structure of α-glucose. (5marks)

(b) Describe the formation of a disaccharide from single sugars. (5 marks)

8. Describe the structure of the plasma membrane according to the fluid mosaic model. (10 marks)

9. 'Water is essential for life' Explain in what ways this is statement is true for animals. (10 marks)

END