S.5 BIOLOGY (P530/2)
Time ;**2Hours 30 minutes**

INSTRUCTIONS TO CANDIDATES

*Answer question **1**in section* **A** *plus* **three** *others in section* **B**

SECTION A (4O MARKS)

1. **Figure. 1** below shows the percentage of haemolysed red blood cells, when samples of red blood cells were placed in a series of sodium chloride solution of varying concentration. Study the figure and answer the questions that follow.

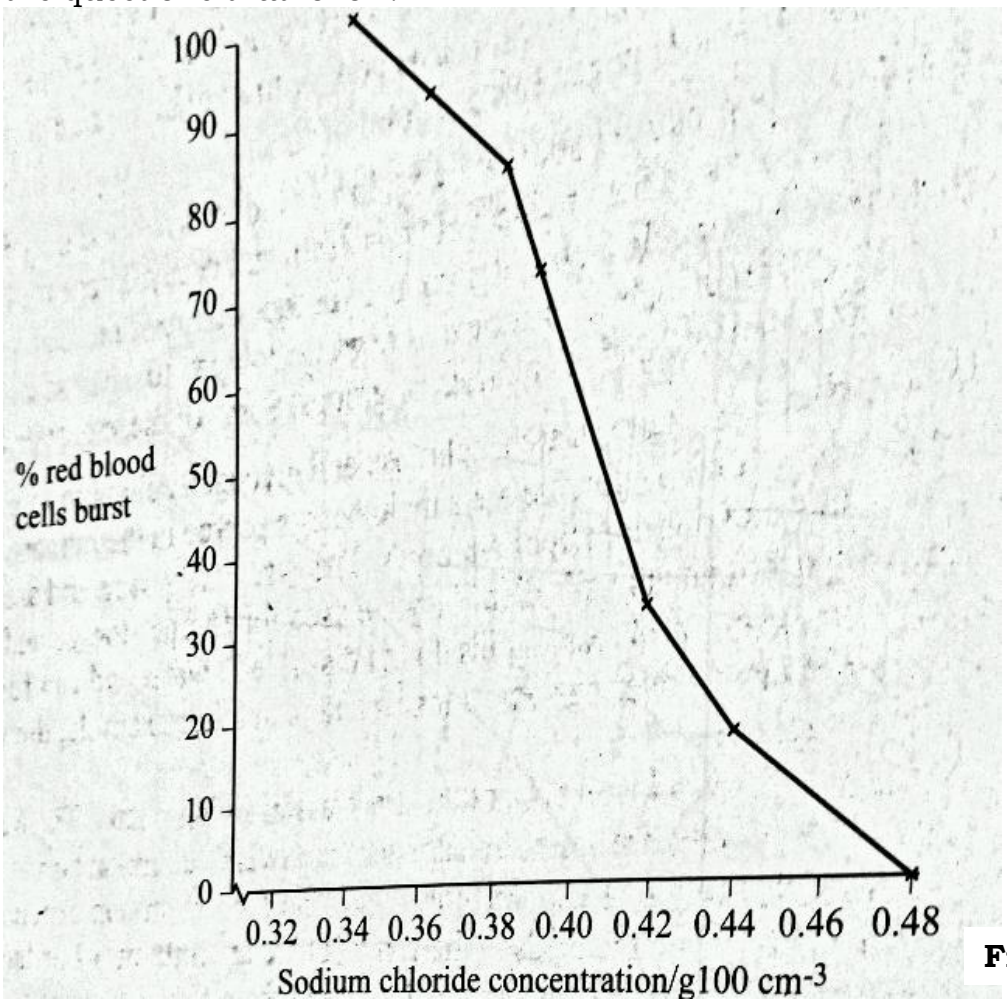

Fig 1

(a) (i). At what concentration of sodium chloride solution was the proportion of the haemolysed cells equal to the non haemolysed cells? Explain your answer. **(04marks)**
(ii). Account for the results obtained at 0.34% salt concentration and 0.48% salt concentration. **(08marks)**
(iii). When cells from an onion were placed in the same range of sodium chloride solution, none of the cells burst. Explain **(02marks)**

Figure 2 shows the effect of temperature on the absorption of potassium ions by cells of carrot tissue, when slices of carrot tissue were immersed in a potassium chloride solution of known concentrations. The change in concentration of potassium ions in solution was determined at 2℃ and 20℃ at intervals of 6 hours. Study it and answer questions, b-e.

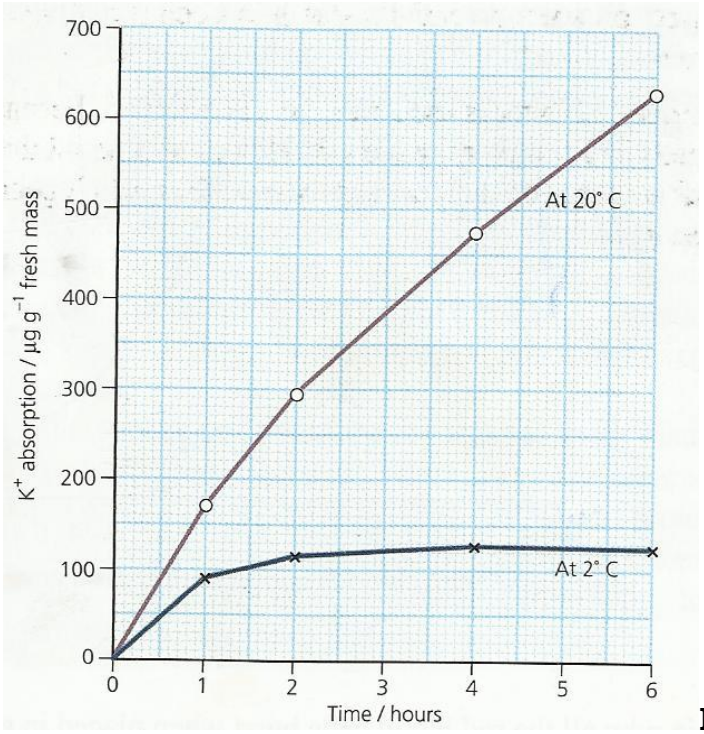

Figure. 2

(b) Calculate the mean rate of absorption of potassium ions between **2** and **6** hours at.
(i). 2℃,
(ii). 20℃, show your working. **(06marks)**

(c) (i.) Compare the rates of potassium ion absorption 2℃ and 20℃ in figure **2**. **(06marks)**
(ii). Account for the observed differences in the rates of potassium ions at the two temperatures. **(06marks)**

(d) During the first hour, some of the potassium ions enter the cells by diffusion. State **two** conditions which are necessary for a substance to enter a cell by diffusion. **(02marks)**

(e) (i.) Apart from mechanism mentioned in (d**)**, state any other means of mineral salts uptake by plants and give **four** differences between them. **(05marks)**

SECTION B (60MARKS)

2. Discuss the ways in which bacteria, fungi and viruses may be

(a) Beneficial to man. **(10 marks)**

(b) Harmful to man (**10marks)**

3. (a) Distinguish between the **Fluid mosaic** and **Danielli-Davson** model of the cell membrane. **(05marks)**

(b) What is the significance of possessing membrane bound organelles in eukaryotic cells? **(05marks)**

(c.). How is the structure of the plasma membrane suited to transport materials across it? **(12marks)**

4. (a) Explain how **exocytosis** and **endocytosis** occur across the cell membrane. **(08marks)**

(b) Explain how the following can be achieved in organisms

(i) Short diffusion distance **(06marks**)

(ii) Steep concentration gradient **(02marks)**

(iii) Large surface area. (**04marks**)

5. (a) Outline the functions the epithelial tissue. **(05marks)**

(b) Explain how the epithelial tissue is suited for the functions in (a) above. **(15marks)**

6. (a) Describe the osmotic relations of a plant cell. (**10marks)**

(b) Outline the differences between **wilting** and **plasmolysis**. **(05marks)**

(c) Explain the significances of increase in turgidity to plants **(05marks)**

END