NAME:……SIGN:……..

P530/2
Biology
Paper 2
$2\frac{1}{2}$ Hours

JINJA MODERN SENIOR SECONDARY SCHOOL

Uganda advanced certificate of education
S.5 Biology theory
Paper 2
2 hours and 30 minutes

INSTRUCTIONS

- This paper consists of two ***sections A*** and ***B***
- Answer question ***one*** in *section A* plus ***three*** others from *section B*.
- Candidates are advised to read the questions carefully, organize their answers and present them precisely and logically illustrating with well-labeled diagrams where necessary.

FOR EXAMINER'S USE ONLY

SECTION	NUMBER	MARKS
A		
B	No.	
	No.	
	No.	

SECTION A

(i) ***Fig.1.*** **represents the different forms of which materials are moved through the cell membrane of eukaryotic cells. In the study conducted, glucose molecules were used. Study the figures below and use them to answer questions that follow.**

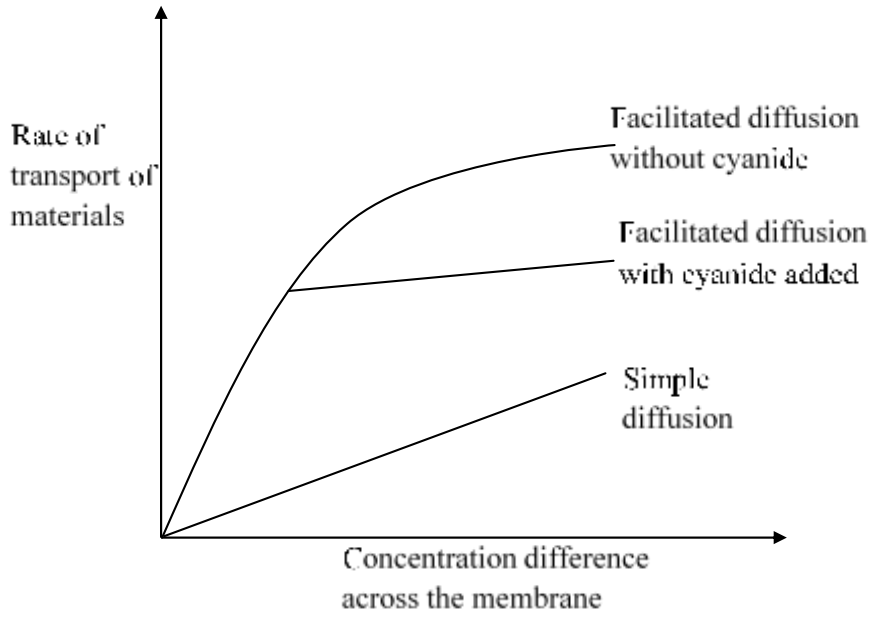

Fig.1.

a) **Compare the rate of transport of materials using simple diffusion and facilitated diffusion without cyanide.** (***05marks***)

b) **Explain the trends observed for each mechanism of transport of materials below**

   (i) **Simple diffusion** (***03marks***)

   (ii) **Facilitated diffusion without cyanide** (***04marks***)

   (iii) **Facilitated diffusion with cyanide added.** (***06marks***)

c) **Explain the factors that determine the mechanism of movement of different substances through the cell membrane.** (***08marks***)

d) **(i) Describe the adaptation of the cells to enable the movement of different materials in and out of them.** (***09marks***)

   (ii) Mention the significance of movement of materials in and out of cells. (***05marks***)

SECTION B

2. a) State the following laws of genetics.

   (i) Law of segregation (***02marks***)

   (ii) Law of independent assortment (***02marks***)

   b) Giving relevant examples, distinguish between allele and gens. (***06marks***)c) In mice, the dominant allele, ***B*** determines black coat colour, brown coat colour results from recessive allele, ***b***. The dominant allele, ***N*** determines hair which grows straight, wavy hair caused by a recessive allele, ***n*** and given that the genes are autosomal. A black wavy-haired male cat was mated with a brown straight-haired female cat and the F1 kittens were selfed. Work out the phenotype ratio of the F2 kittens. (***10marks***)

3. a) Explain the role of the following substances in the formation of proteins.

   (i) Deoxyribonucleic acid (DNA) (***03marks***)

   (ii) Ribonucleic acid (RNA) (***04marks***)

   b) Describe what happens in the following stages of protein synthesis in the cell.

   (i) Amino acid activation. (***04marks***)

   (ii)Chain initiation stage (***03marks***)

   (iii) Chain termination stage (***03marks***)

   c) What are the properties of a genetic code? (***03marks***)

4. a) Explain the adaptations of the gut at various sections to its function. (***08marks***)

   b) Describe the structure of a single villus in the ileum of mammalian alimentary canal. (***05marks***)

   c) Explain the role of the sodium – potassium pump in the absorption of glucose in the ileum. (***07marks***)

5. a) Compare the following aspects of life between insect and bony fish.

   (i) Breathing (***08marks***)

   (ii) Gaseous exchange. (***05marks***)

   b) How is the gill filament adapted to its function. (***07marks***)

6. a) Explain the following phenomena in some organisms.

   (i) Absences of transport system in protozoans. (***05marks***)

   (ii)Presence of a transport system with pigments in mammals. (***08marks***)

   b) By stating the examples of organisms in each case, explain the efficiency of double circulation over single circulation. (***07marks***)

END