Names:……...**Index. No:**…….…….

School Exam Number……..…...**Signature**:……..…

*Candidates should **NOT** write their Centre Name or Centre Number anywhere on this booklet*

P530/2
BIOLOGY
(THEORY**)**
Paper 2
29 July 2024
2½ hours

ENTEBBE JOINT EXAMINATION BUREAU

Uganda Advanced Certificate of Education

BIOLOGY

Paper 2

THEORY

2 hours 30 minutes

INSTRUCTIONS TO CANDIDATES:

*This paper consists of **six** numbers in two* Sections

Section **A** *consists of only one number and it is **compulsory**.*

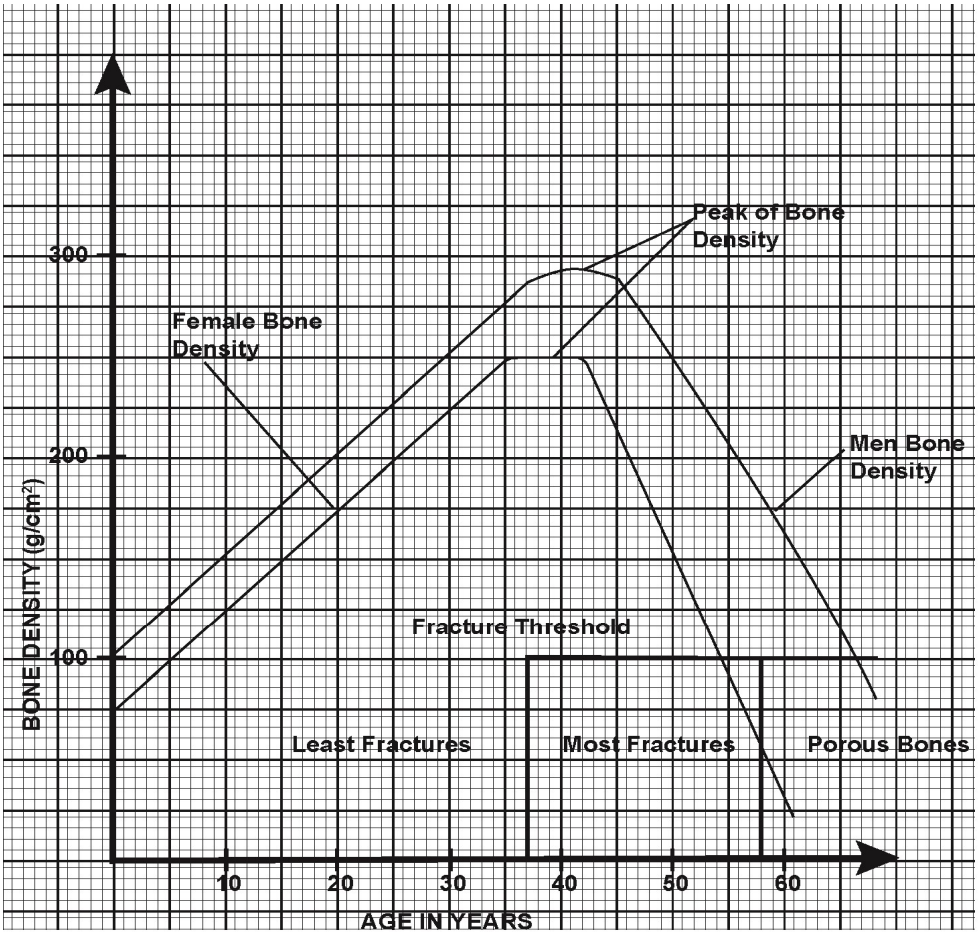
Section **B** *consists of 5 numbers. Attempt only* **three** *numbers from this* Section

Candidates are advised to read each question carefully and organize their answers and then present them precisely and logically using well labeled diagrams where necessary

FOR EXAMINER'S USE ONLY		
NUMBER ATTEMPTED	**MARKS**	**EXAMINER'S INITIALS**
SECTION A		
SECTION B		
TOTAL		

SECTION A: COMPULSORY

1. Osteoporosis is a brittle bone disease characterized by the degeneration of bone mass resulting from senescence in humans. After an investigation and a study of categories of individuals of different ages in men and women, the bone density of each individual categories at different ages were done and results shown in the graph below. Study the graph and answer the questions that follow.



a) Compare the trends in men and women. *(03 marks)*

b) Explain the trends observed in men. *(04 marks)*

c) Explain the difference in the trend between men and women. *(08 marks)*

d) Explain how the development of osteoporosis is related to diet and exercise. *(04 marks)*

e) Explain other causes of osteoporosis in humans other than diet. *(08 marks)*

f) What are the effects of osteoporosis in humans? *(04 marks)*

g) The table below shows the daily calcium intake recommended by one of health statutory body in Uganda to different age brackets.

Population town groups	**Calcium intake or daily mg**
Children 7-12 years	800
Women over 45 years old not on HRT	1000
Pregnant and lactating teenagers	1500
Pregnant and lactating women over 45 years old	1200
Men over 45 years old	1500

i) Explain the difference between calcium intake of children between 7-12 years and men over 45 years old. *(03 marks)*

ii) How can the levels of calcium be maintained constant in the body? *(04 marks)*

iii) Explain the importance of sun bathing in humans. *(02 marks)*

SECTION B: (60 MARKS)

2. (a) Distinguish between **lock and key** and **induced fit** hypotheses. *(04 marks)*

(b) How do the following confirm the one gene one enzyme hypothesis? *(10 marks)*

i) Phenylketonuria
ii) Alkaptonuria

(c) Briefly describe the end-product inhibition in the control of enzyme action. *(06 marks)*

3. (a) Describe how the changes in the soil osmotic pressure can affect the mechanical support of the plant. *(05 marks)*

(b) Describe the mechanism of loading photosynthetic products and pressure flow translocation in phloem of the plant. *(15 marks)*

4. (a) Compare the factors that control ventilation with those that control heart beat in humans. *(08 marks)*

(b) Explain how the transmission of an impulse is inhibited across the synapse across the synapse? *(12 marks)*

5. (a) What roles do pancreas and liver play in? *(18 marks)*

i) food digestion;
ii) metabolism of absorbed products.

(b) How can the diet of raw liver prevent the disease pernicious anaemia? *(02 marks)*

6. (a) What is meant by **gene reshuffling**? *(02 marks)*

(b) Explain the causes of gene reshuffling. *(06 marks)*

(c) In drosophila, the gene for wing length and shape of the abdomen are sex-linked. The gene for long wing and broad abdomen are dominant over those of vestigial wings and narrow abdomen. A cross between homozygous long winged and narrow abdomen female fly with a vestigial winged and broad abdomen male fly was done.

(i) Work out the phenotypes of the ***F1*** generation. *(06 marks)*

(ii) A cross between a female from the ***F1*** generation produced above, with the vestigial and narrow abdomen male fly gave the following results;

Long winged, narrow abdomen flies = 35
long winged, broad abdomen flies = 17
vestigial winged, broad abdomen flies = 18
vestigial winged, narrow abdomen flies = 36

Account for the above results using suitable crossings. *(06 marks)*

END