

ALLIANCE GIRLS HIGH SCHOOL MOCK 2017
BIOLOGY PAPER 2

SECTION A: (40 marks)

INSTRUCTIONS: Answer *All* questions in this spaces provided.

1. a) What is a dominant gene. (1mk)

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b) In an experiment, a variety of garden peas having a smooth seed coat was crossed with a variety having a wrinkled seed coat. All the seeds obtained in the F1 generation had a smooth seed coat. The F1 generation was selfed. The total number of F2 generation was 7324. Using letter R to represent the gene for smooth seed coat, work out the genotypes for the F2 generation. (4mks)

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c) Work out the following for the F2 generation;

(i) Genotypic ratio. (1mk)

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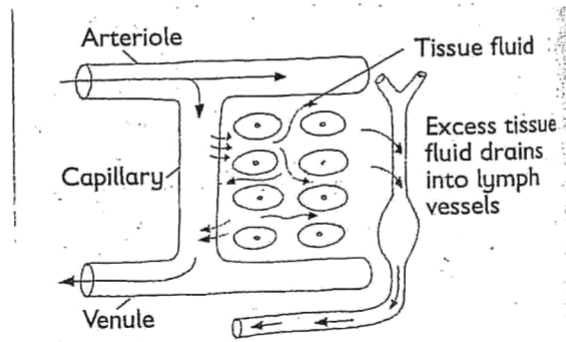
(ii) Total number of wrinkled seeds. (1mk)

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(iii) Phenotypic ratio (1mk)

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2. The following figure represents cells of a tissue and associated circulatory vessels.



a) (i) Name the fluid that is ultrafiltered from the capillary into space A. (1mk)

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(ii) How is the capillary adapted to carry out ultrafiltration? (2mks)

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(iii) Name two substances that the cells obtain from the fluid in space A. (2mks)

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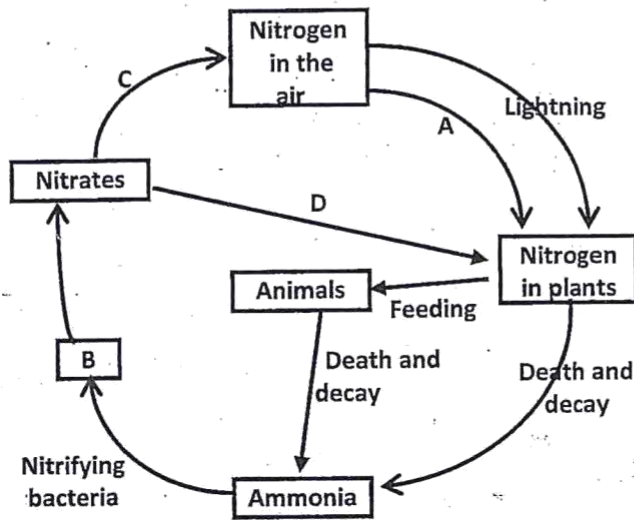
b) Explain why the left ventricle has thicker cardiac muscles than the right ventricle. (1mk)

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c) State the difference in composition between fluid A and B. (2mks)

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3. The diagram below represents the nitrogen cycle.



- a) State the processes labeled; (2mks)
- A.....
- D.....
- b) Name the compound represented by B. (1mk)
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- c) List two groups of organisms that cause decomposition of dead organic matter in an ecosystem? (2mks)
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- d) What is the importance of decomposition in an ecosystem? (1mk)
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- e) State the part of the plant where process A takes place. (1mk)
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- f) How would excess pesticides in the soil interfere with process A. (1mk)
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4. a) Distinguish between divergent and convergent evolution. (4mks)

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b) What is meant by Homologous structures. (1mk)

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c) What is meant by the term organic evolution. (1mk)

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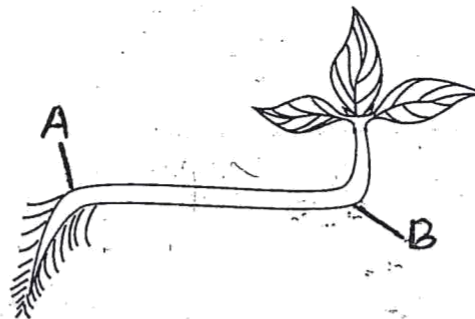
d) Explain the theory of evolution by natural selection. (2mks)

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5. a) What is irritability. (1mk)

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b) A seedling was placed on a bench in a horizontal position. After a few days the growth pattern shown below was recorded.



i) Explain the results obtained at points:

A.....
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.....(2mks)

B.....
.....
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.....(2mks)

c) Name the part of a brain which controls: (3mks)

(i) Homeostatic processes.
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(ii) Memory and learning.
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(iii) Maintains body balance and posture.
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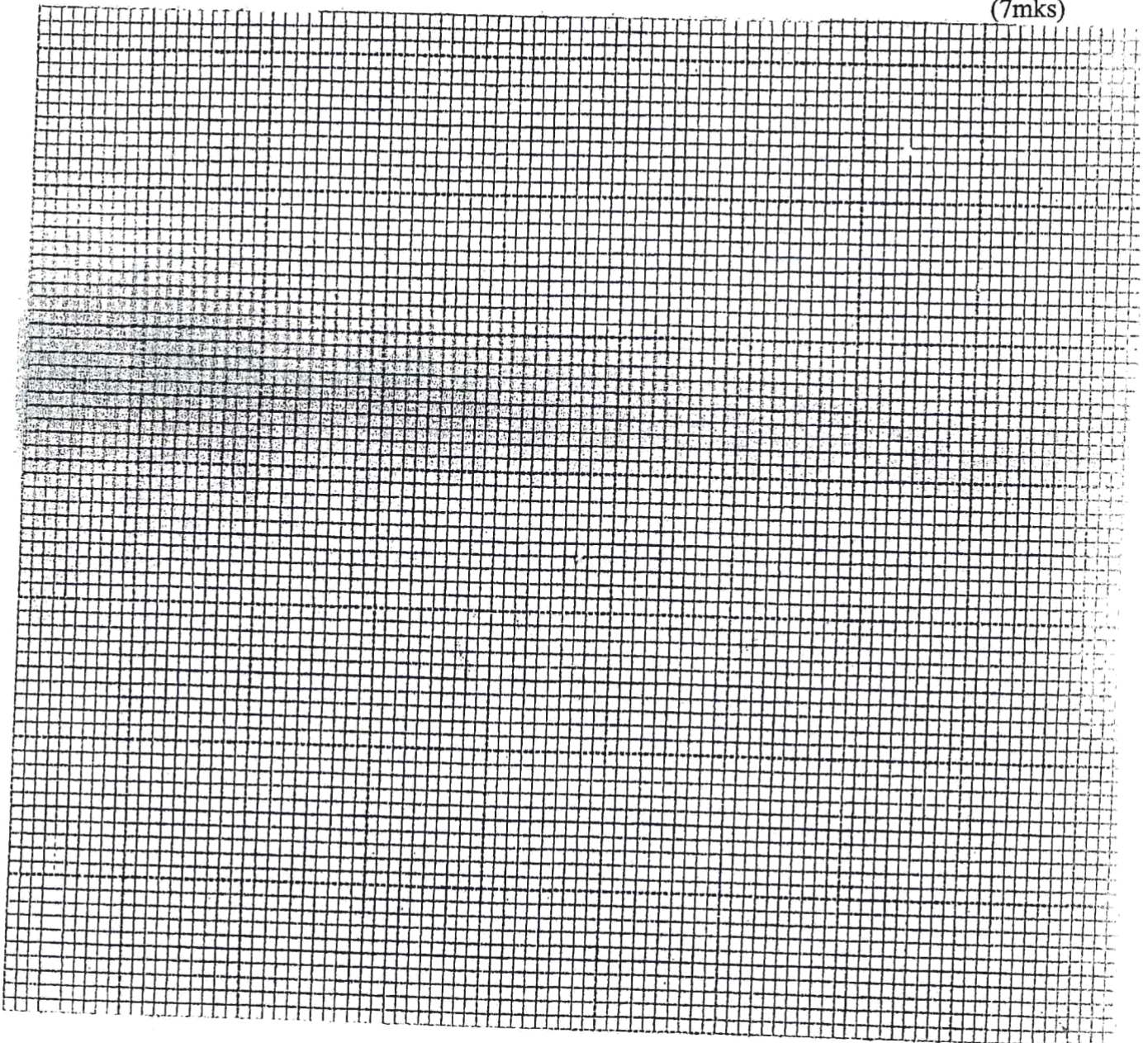
SECTION B (40 MARKS)

INSTRUCTIONS: Answer question 6 (compulsory) and either question 7 or 8 in the spaces provided after question 8.

6. The following table shows daily energy requirement of people of different ages and gender.

Age/years	Energy requirement	(KJ per day
	Males	Females
1	3000	3000
2	6000	5500
5	7500	7000
8	8800	8800
11	10000	9200
14	12500	10500
18	14200	9600
25	12100	8800

a) Plot a graph of age against energy requirements for both males and females on same graph. (7mks)



b) Account for the shapes of the two curves on the graph.

(i) Curve for males energy requirement (KJ per day) (3mks)

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(ii) Curve for Females energy requirement (KJ per day) (3mks)

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c) Explain why fats are not the main respiratory substrates despite the fact that they have the highest calorific value. (2mks)

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d) Give reasons why a pregnant mother excretes less urea than a normal mother. (2mks)

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e) Apart from age and sex, name three other factors that determine energy requirements in the body. (3mks)

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7. Discuss how xerophytes are adapted to their habitat. (20 mks)

8. Explain how biotic factors affect distribution of organisms in an ecosystem (20 mks)

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