

# FORM FOUR TERM ONE EXAM 2020

## BIOLOGY PAPER 2

TIME: 2 HOURS

### INSTRUCTIONS TO CANDIDATES:-

- Write your **name** and **adnumber** in the spaces provided above.
- This paper consists of **two** sections; **A** and **B**.
- Answer **all** the questions in Section **A** in the spaces provided.
- In section **B**, answer question **6** (**compulsory**) and either question **7** or **8** in the spaces provided after question 8.

### For Examiner's Use Only:

Section	Question	Maximum score	Candidates score
A	1	8	
	2	8	
	3	8	
	4	8	
	5	8	
B	6	20	
	7 or	20	
	8	20	
<b>TOTAL SCORE</b>		<b>80</b>	

*This paper consists of 10 printed pages. Candidates should check to ascertain that all the pages are printed as indicated and that no questions are missing.*

### SECTION A (40 Marks)

*Answer all questions in this section in the spaces provided.*

1. In human beings, a **downward pointed frontal hairline** (“windows peak”) is a heritable trait. A person with windows peak always has at least one parent who has this trait; where as persons with **frontal hairline** may occur in families in which one or even both parents have windows peak. Using **W** and **w** to symbolize genes for this trait
- (a) Determine the F1 generation if a homozygous windows peak male parent is married to a homozygous frontal hairlined female parent (4mks)

# FORM FOUR TERM ONE EXAM 2020

## BIOLOGY PAPER 2

(b) State two causes of variations

(1mk)

.....

.....

c) Name two sex linked genetic disorders affecting human females and males

(2mks)

.....

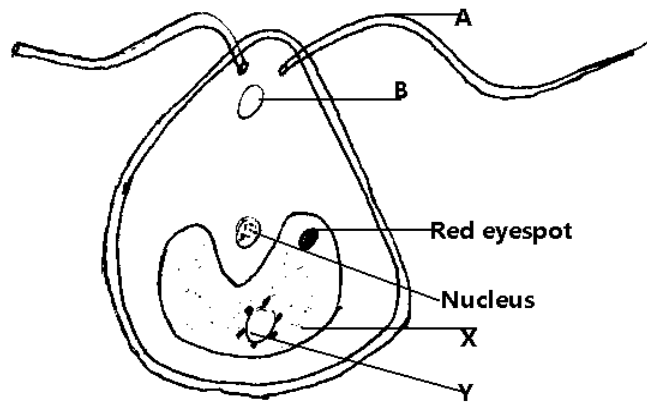
.....

(d) What is genome

.....

.....

2. The diagram below shows an organism obtained from an aquatic ecosystem



(a) **State** the kingdom in which the organism belongs.

(1mk)

.....

(b) **Name** the parts labeled

(1mk)

**B**

.....

**Y**

(1mk)

# FORM FOUR TERM ONE EXAM 2020

## BIOLOGY PAPER 2

.....  
(c) **State** the functions of the following parts

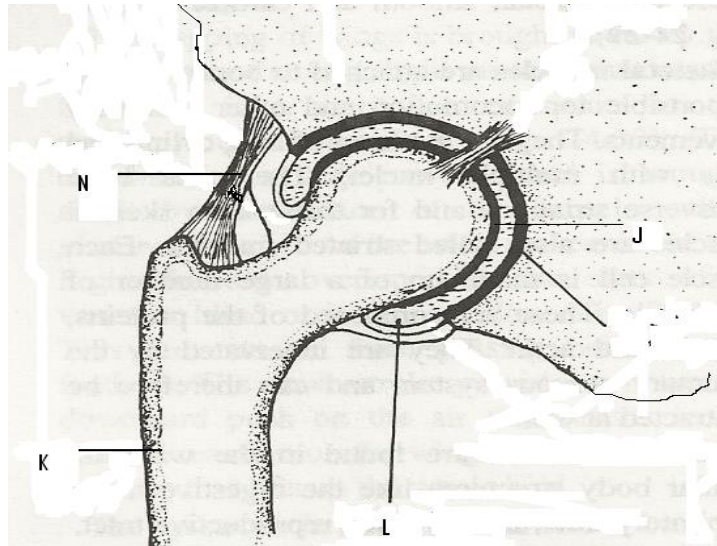
**A** (1mk)

.....  
**X** (1mk)

.....  
**Z** (1mk)

.....  
(d) Explain briefly why the organism is described as eukaryotic (2mk)

.....  
3a) The diagram below shows some of the features of a synovial joint. Study the diagram carefully and answer the questions that follow.



(a) Name the type of synovial joint. (1 mark)

.....  
(b) Name the parts labeled J, and L (2 marks)

# FORM FOUR TERM ONE EXAM 2020

## BIOLOGY PAPER 2

J .....

L .....

(c) State **two** roles of the part labeled L. (2 marks)

.....  
.....  
.....

(d) Suggest **one** advantage of this type of joint. (1 mark)

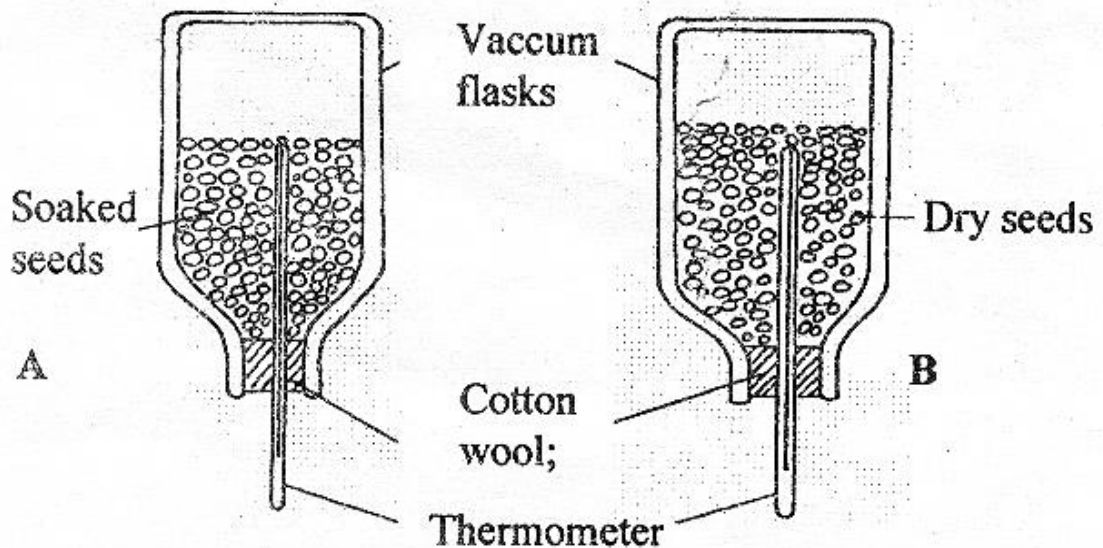
.....  
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b) State how the following tissues are adapted to provide mechanical support in plants (2mks)

i) Parenchyma

ii) Collenchyma

4. A student set up an experiment using soaked and dry seeds as shown below



a) State the objective of this experiment (1mk)

# FORM FOUR TERM ONE EXAM 2020

## BIOLOGY PAPER 2

b) State the observations made in each of the flask after 24 hours (2mks)

c) Account for the observation made in (b) above (2mks)

d) Suggest why vacuum flasks were used in this experiment (1mk)

e) What alteration would you make in the set-up to make the results more reliable (1mk)

f) Why should the seeds be washed with antiseptic/10% formalin? (1mk)

5 a) Explain how the following meristematic tissues contribute to growth of higher plants

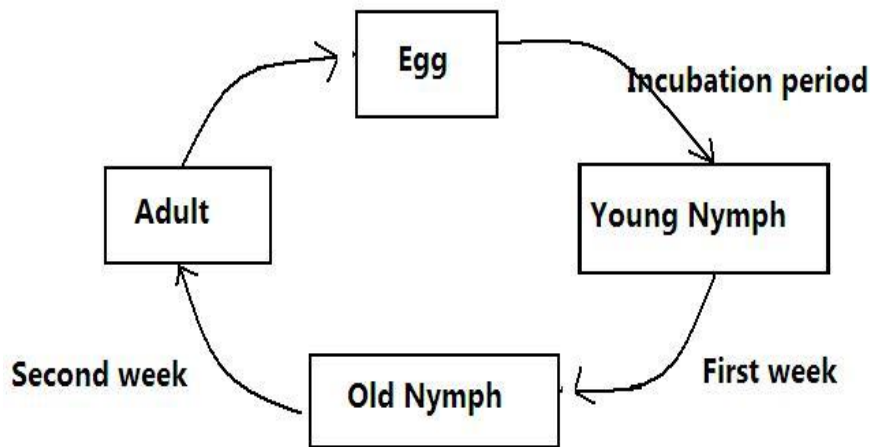
i) Vascular cambium (2mks)

ii) Cork Cambium (2mks)

# FORM FOUR TERM ONE EXAM 2020

## BIOLOGY PAPER 2

b) The diagram below shows a life cycle of a cockroach



a) Name the hormone that would be at high concentration during.

(i) First week (1mk)

.....

(ii) Second week (1mk)

.....

b) Name the structure that produces hormone in a (ii) above (1mk)

.....

c) Name the series of stages through which the nymph undergoes to reach adult stage (1mks)

.....

.....

# FORM FOUR TERM ONE EXAM 2020

## BIOLOGY PAPER 2

### SECTION B (40 Marks)

**Answer question 6 (Compulsory) and either question 7 or 8 in the spaces provided.**

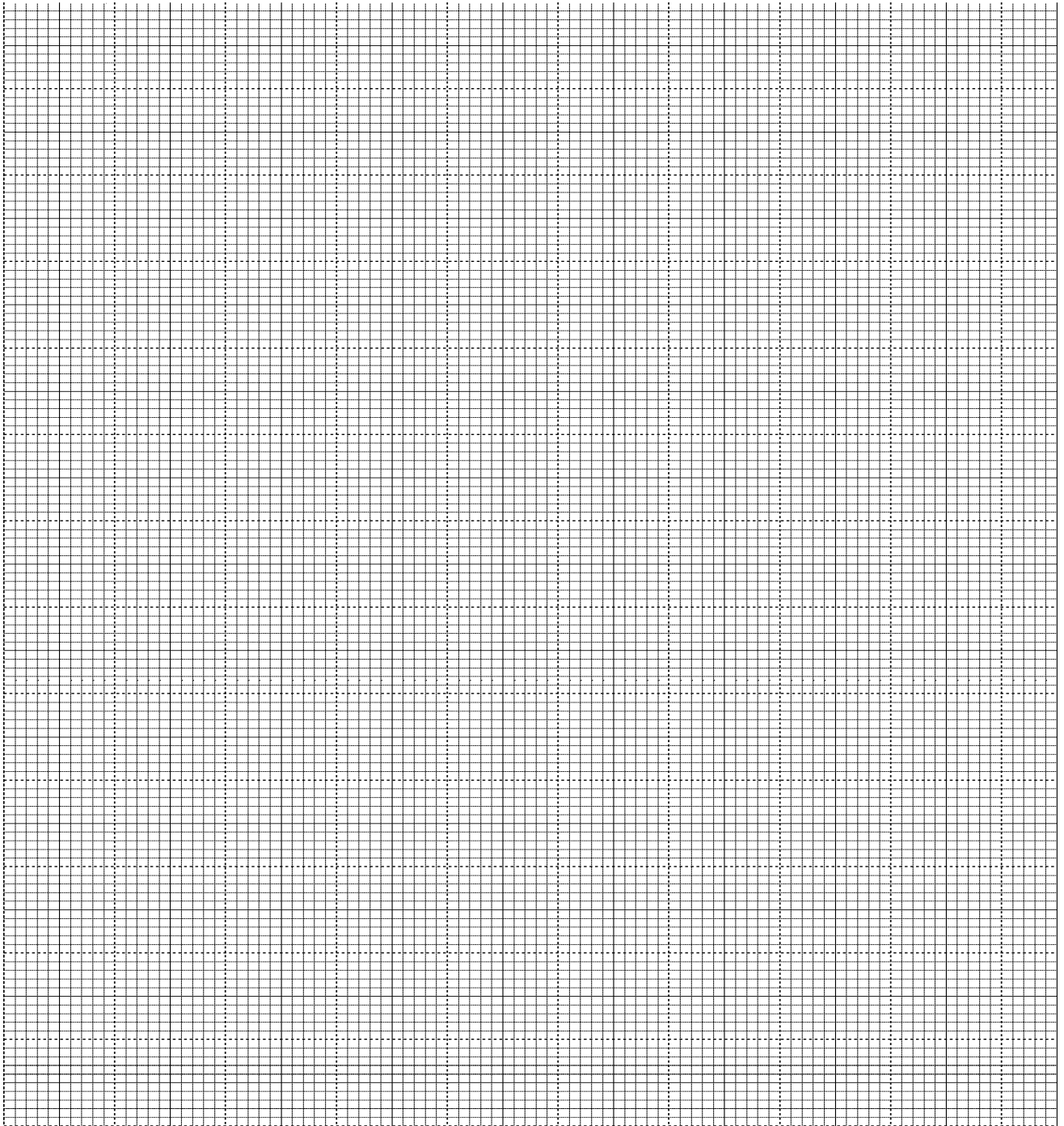
6. The menstrual cycle is a sequence of events repeated monthly in the female production system. The table below shows the concentration of oestrogen and progesterone hormones and body temperatures of female against time.

Time in days	Oestrogen mg/100cm <sup>3</sup> of blood	Progesterone mg/100cm <sup>3</sup> of blood	Temperature in 0°c
1	20	0	36.4
2	20.5	0	36.6
3	25	0	36.7
4	27.5	0	36.8
5	30	0	36.7
6	32.5	0	36.6
7	35	0	36.8
8	40	0	36.7
9	48	0	36.6
10	56	0	36.8
11	64	0	36.7
12	72	0	36.6
13	80	0	36.4
14	170	20	36.3
15	140	50	36.6
16	80	80	37.0
17	70	130	37.2
18	65	170	37.0
19	60	160	37.1
20	65	150	37.15
21	130	130	37.2
22	140	110	37.1
23	130	90	37.0
24	100	70	37.1
25	80	50	37.2
26	60	20	37.0
27	20	0	36.4

# FORM FOUR TERM ONE EXAM 2020

## BIOLOGY PAPER 2

a). Using the same axis draw graphs of oestrogen and progesterone against time/days (8mks)





# FORM FOUR TERM ONE EXAM 2020

## BIOLOGY PAPER 2

b) State the possible event taking place in the uterus during the first week? (1 mark)

.....  
.....

c) State the events taking place in the ovary between day 1 and day 13. (2 marks)

.....  
.....  
.....

d) Account for the sudden increase in the progesterone concentration between day 14 and day 18. (2 marks)

.....  
.....  
.....

e) Account for the change in temperature between day 14 and 17. (1 mark)

.....  
.....

f) Account for the change of the curve of progesterone between day 19 and 27. (2marks)

.....  
.....  
.....

a) State the function of the following.

(i) Ovary (1mark)

.....  
.....

(ii) Progesterone (1 mark)

.....  
.....

(iii) Oestrogen (1 mark)



