**231/3**

**BIOLOGY NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**PAPER 3**

**JULY 2019 CLASS\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ADM. NO. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**TIME: 1 ¾ HOURS**

**BIOLOGY**

**PAPER 3**

**INSTRUCTIONS TO CANDIDATES**

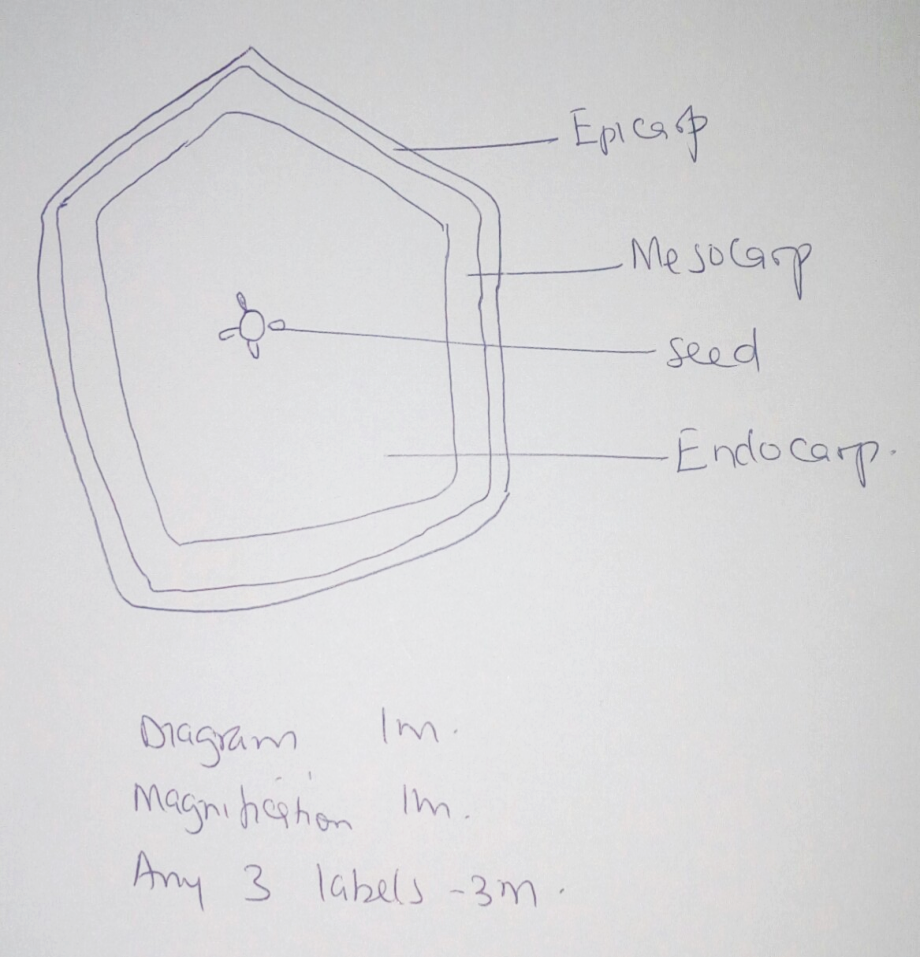
* *Write your* ***name*** *and* ***index******number*** *in the spaces provided above.*
* ***Sign*** *and write the* ***date*** *of examination in the spaces provided above.*
* *You are required to spend the first 15 minutes of the 1 ¾ hours allowed for this paper reading the whole paper carefully before commencing your work.*
* *Answers must be written in the spaces provided in the question paper.*

**For Examiner’s Use only:-**

|  |  |  |
| --- | --- | --- |
| **Question** | **Maximum Score** | **Candidate’s Score** |
| 1 | 12 |  |
| 2 | 14 |  |
| 3 | 14 |  |
| TOTAL | 40 |  |

*This paper consists of 4 printed pages. Candidates should check to ascertain that all pages are printed as indicated and that no questions are missing.*

1. You are provided with a specimen labeled T which is a fruit. Use it to answer the questions that follow.
2. Make a transverse section of the specimen T. Draw and label at least 3 parts. (Save the specimen for use in question 2) 5mks



**Magnification between X1 and X5**

1. With reasons, state the identity of fruit T.

Type of fruit **Berry** 1mk

Reason **has many seeds** 1mk

1. Suggest the possible agent of dispersal and give **two** reasons

Agent **Animal** 1mk

Reason **brightly coloured; scented; fleshy; large; first** 2mk

1. What is the placentation of T? **Axile;** 1mk
2. Specimen T was green in colour before it was treated with a plant hormone.

Suggest the plant hormone.

**Ethylene/ ethyne**; 1mk

1. (a) Crush a piece of the specimen T in a test tube using a stirring rod, add some water and shake. decant into another test tube. Use the reagents available to establish the food substances present in specimen T extract by filling in the table below. 9mks

|  |  |  |  |
| --- | --- | --- | --- |
| FOOD | PROCEDURE | OBSERVATIONS | CONCLUSION |
| Reducing sugar | **To extract add Benedict’s solution, then heat;** | **Yellow / orange / brown colour observed;** | **Reducing sugars present;** |
| Protein | **To extract add sodium hydroxide solution, then copper (II) sulphate drop by drop;** | **No colour change observed / blue colour persist;** | **Protein absent;** |
| Ascorbic acid/ Vitamin C | **Add DCPIP to extract drop wise;** | **DCPIP decolourized;** | **Vitamin C / ascorbic acid present;** |

(b) Identify one type of organic substance absent in T **Protein** Rj. Any other 1mk

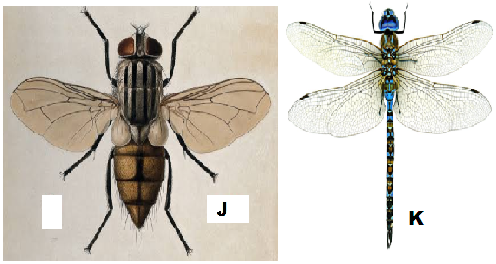
(c) Based on the tests you have carried out above, give one reasons why consuming a lot of T may be unsuitable to a diabetic person.

**A diabetic person is unable to regulate blood sugar; too much T will increase sugar levels to dangerous levels;** 2mks

(d) How can you show that somebody suffer from diabetes mellitus in the school laboratory?2mks

**Take a urine sample and test for reducing sugars; if present, the person is diabetic**

1. Below are photographs of two specimens, J and K. Both of them belong to the same phylum and class. Observe them carefully before you answer the questions that follow.



1. Name the class to which J and K belong and support your answer with two reasons.

Class **Insecta;** 1mk

Reasons 2mks

1. **Six legs; three body parts; two antennae; two compound eyes;**
2. Suggest why the circulatory fluid in J and K has no haemoglobin. 2mks

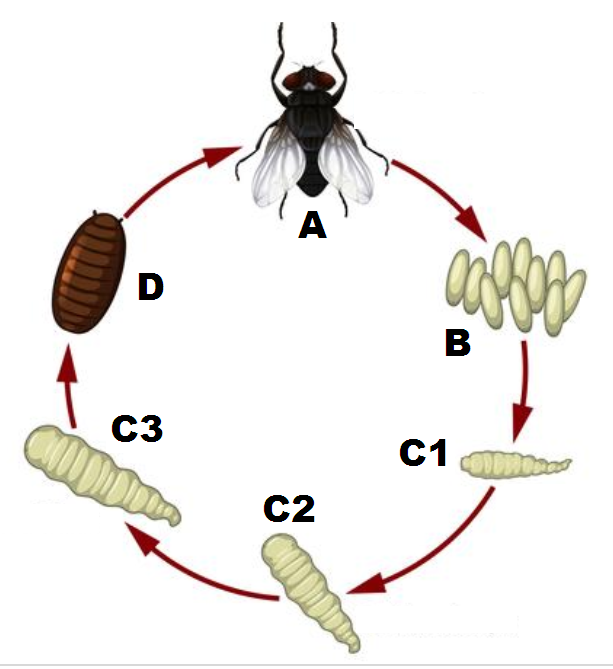
**Haemoglobin used to transport oxygen/ carbon (IV) oxide in the body; oxygen is taken directly to tissues/ carbon (IV) oxide taken directly from tissues by tracheoles;**

1. Observe their wings and suggest the type of evolution that could have taken place to give rise to J and K, and then give a reason for your answer.
2. .

Type of evolution **divergent evolution;** 1mk

Reason **one pair of wings in J reduced to halters/ are vestigial; but both are functional in K** 2mks

1. Below is a diagram showing the life cycle of specimen J.



1. Identify the stage labeled D. **pupa stage;** 1mk
2. Name the hormone responsible for the change from D to A. 1mk

**Ecdysone; accept Moulting hormone**

1. Explain the differences in the change from C2 to C3 and from C3 to D. 4mks

C2 to C3 – **moulting hormone / Ecdysone induce moulting; but presence of juvenile hormone prevent formation of pupa;**

C3 to D – **moulting hormone / Ecdysone induce moulting; but abscence of juvenile hormone lead to formation of pupa;**