

BIOLOGY
PAPER - 2
(PRACTICAL)

(Maximum Marks: 30)

(Time allowed: Three hours)

*(Candidates are allowed additional 15 minutes for **only** reading the paper.
They must NOT start writing during this time.)*

*Answer **all** questions.*

All working including rough work should be done on the same sheet as the rest of the answer.

The intended marks for questions or parts of questions are given in brackets []

Note: Q4 (Spotting) is to be attempted on a separate continuation sheet. The continuation sheet is to be handed over to the Supervising Examiner after the last observation. This continuation sheet should be attached to the main answer booklet of the candidate after the examination.

Question 1

[5]

- (a) Observe the given specimen **D-41** carefully. Describe its floral characteristics in semi-technical terms. (Details of individual whorls are not required.)
- (b) With a sharp razor blade, cut a longitudinal section of a flower of the specimen **D-41**. Place one of the cut surfaces on a moist filter paper so that all the parts are clearly visible. **Show it to the Visiting Examiner.**

Draw a neat and labelled diagram of one of the cut surfaces.

- (c) With the hand lens provided, carefully observe the stamens. Record your observations in a tabular form as shown below:

| Androecium: | | D-41 |
|--------------------|--|-------------|
| (i) | Relationship of stamens to petals | |
| (ii) | Relationship of stamens with each other | |
| (iii) | Type of attachment of the anther to the filament | |

- (d) Separate one stamen from the cut surface of specimen **D-41** and make its labelled diagram.

- (e) Take a fresh specimen of **D-41**. With the help of forceps remove the calyx and corolla. Isolate the gynoecium. Cut a transverse section of the ovary. Make a labelled diagram of the transverse section.
- (f) Record the features observed in the transverse section, as shown below:
 - (i) Number of carpels
 - (ii) Type of placentation
 - (iii) One special feature of the placenta
- (g) Write the floral formula of specimen **D-41**.
- (h) Draw the floral diagram of the specimen **D-41**.
- (i) Name the family to which specimen **D-41** belongs.
- (j) Give two characteristic features of the family mentioned by you in (i) above.
- (k) Mention one economically important plant belonging to the family you have named in (i) above. Write the **complete** botanical name mentioning the **genus** as well as **species**.

Question 2

[3]

- (a) You are provided with 5% solution of an enzyme **D-42**, 1% solution of starch, 1% NaCl solution and buffer pH 6·8.
- (b) Set up six test tubes in a test tube stand and label each with a glass marker or stickers as A₁, A₂, B₁, B₂, C₁ and C₂.
- (c) Take three (250 ml) beakers and label these as A, B and C. Pour 150 ml water in each of the three beakers and set the temperature of water as: beaker A at 37°C, beaker B at 80°C and beaker C at 5°C.
- (d) In each of the test tubes mentioned in (b) above, put:
 - 2 ml of starch solution (1%)
 - 1 ml of NaCl(1%)
 - 1 ml of buffer pH 6·8
- (e) Place the test tubes in the beakers as follows:
 - Test tube A₁ in beaker A (37°C), test tube B₁ in beaker B (80°C) and test tube C₁ in beaker C (5°C)
- (f) Boil 10 ml of enzyme **D-42** provided. Bring it to room temperature and then add 2 ml of this preheated enzyme in each of the test tubes A₂, B₂ and C₂.

Now, place the test tubes in the beakers as follows:

 - Test tube A₂ in beaker A, test tube B₂ in beaker B and test tube C₂ in beaker C.

- (g) Leave all the test tubes for 20 minutes in their respective beakers. Stir the content at regular intervals. Add two drops of 1% iodine solution in each of the test tubes marked A₁, A₂, B₁, B₂, C₁ and C₂.
- (h) Record your observations in a tabular form as shown below. **Show your observations to the Visiting Examiner.**

| Test tube No. | Temperature | Observation/ colour change |
|----------------|-------------|----------------------------|
| A ₁ | 37°C | -- |
| A ₂ | 37°C | -- |
| B ₁ | 80°C | -- |
| B ₂ | 80°C | -- |
| C ₁ | 5°C | -- |
| C ₂ | 5°C | -- |

- (i) What is the purpose of preheating the enzyme **D-42**?
- (j) What is the end product of digestion by enzyme **D-42**?
- (k) What conclusions can be drawn from the results of this experiment?

Question 3

[2]

- (a) With a sharp razor blade, cut thin longitudinal sections of the specimen **D-43** provided. Select a good section and stain it with safranin. Mount the section in glycerine in a slide. **Show your slide to the Visiting Examiner under a low power microscope.**
- (b) Draw a neat labelled diagram of the mount of **D-43** as observed under the microscope. (Microscopic details are not required.)
- (c) Identify the specimen and write two characteristic features of it.

Question 4

[5]

Identify the given specimens A to E. Give two identifying characteristics to support your answer in each case. Draw a neat labelled diagram of each specimen. You are not allowed to spend more than three minutes for each spot.

Note: *Hand over your continuation sheets to the Supervising Examiner after you finish answering this question.*

Question 5

Show the following to the Visiting Examiner for assessment:

- (a) Project [10]
(b) Biology Practical File. [5]

CORRIGENDUM

BIOLOGY PAPER 2

(PRACTICAL)

- (1) Question 2 (e) on page 2 of the Question Paper, should read as follows:

Place the test tubes in the beakers as follows:

Test tube A₁ in beaker A (37°C), test tube B₁ in beaker B (80°C) and test tube C₁ in beaker C (5°C)

In test tubes A₁, B₁ and C₁ add 2 ml of the enzyme solution D42 kept at room temperature.

- (2) Question 3 (a) on page 3 of the Question Paper, should read as follows:

With a sharp razor blade, cut thin **transverse** sections of the specimen D-43 provided. Select a good section and stain it with safranin. Mount the section in glycerine **on** a slide. Show your slide to the Visiting Examiner under a low power microscope.