

BIOLOGY
Paper – 2
(PRACTICAL)

Three hours and a quarter

(The first 15 minutes of the examination are for reading the paper only.

Candidates must NOT start writing during this time).

All workings, including rough work, should be done on the same sheet as, and adjacent to, the rest of the answer.

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

Question 1.

[6]

Examine the given specimens **D-41** provided and answer the following:

- (a) Mention the type of inflorescence.
- (b) Describe the floral characteristics in semi-technical terms (details of individual whorls are not required).
- (c) With the help of forceps, remove the sepals. Next remove the corolla and arrange them in sequence. Draw a neat labeled diagram of the corolla.
- (d) Study the androecium and describe its characteristics in semi-technical terms.
- (e) Take another specimen of D-41 and cut a longitudinal section with a razor blade.
 - (i) Show the cut surface to the External Examiner.
 - (ii) Draw a neat labeled diagram of the L.S of specimen D-41.
- (f) Isolate the pistil from the anther of the flower and make a labeled sketch.
- (g) Take a pistil and cut a transverse section of the ovary. Draw a neat labeled diagram.
- (h) Draw a floral diagram of specimen D-41.
- (i) Write the floral formula of D-41.
- (j) Name the family to which the specimen D-41 belongs to.
- (k) Write the names of any two members belonging to the same family.

Question 2.

You are provided with the following materials: test-tubes, beakers, tripod stand, wire gauze, Bunsen burner/spirit lamp, thermometer, water, 5% enzyme solution, dropper, 1% starch solution, buffer pH 6.8, iodine solution. Set-up the experiment as per the instructions given below.

- (a) Take 6 test-tubes and mark them as 1A, 2A, 3A, 1B, 2B and 3B.
- (b) Take 2 ml each of 5% enzyme in each of the above 6 test-tubes.
- (c) Boil about 150 ml of water in a beaker and place the test-tubes marked 1A, 2A and 3A in it for 15 minutes. Remove the test-tubes from the water bath.
- (d) Keep the test-tubes marked 1B, 2B and 3B at room temperature.
- (e) In each of the above 6 test-tubes, add the following:
 - (i) 2 ml of 1% solution
 - (ii) 1 ml of 1% sodium chloride solution
 - (iii) 1 ml of buffer pH 6.8
- (f) Take 150 ml of water in a beaker and heat it to 7°C.
- (g) Place the test-tubes marked 1A and 1B in it for 15 minutes. Remove 1A and 1B from the water bath.
- (h) Add 0.5 ml of iodine solution in test-tubes 1A and 1B and observe if there are any changes.
- (i) Raise the temperature of the water bath to 37°C.
- (j) Place the test-tubes marked 2A and 2B in it for 15 minutes.
- (k) Remove the test-tubes 2A and 2B from the water bath.
- (l) Add 0.5 ml of iodine solution in the test-tubes 2A and 2B and observe for any changes.
- (m) Raise the temperature of water bath to 75°C and place the test-tubes 3A and 3B in it for 15 minutes.
- (n) Remove the test-tubes 3A and 3B from the water bath.
- (o) Add 0.5 ml of iodine solution in test-tubes 3A and 3B and observe for an changes.

- (p) Record your observations for each test-tube as shown in the table given below.

Sl. No.	Test-tube No.	Temperature of water bath	Observation
1	1A	7°C	
2	2A	7°C	
3	3A	37°C	
4	1B	37°C	
5	2B	75°C	
6	3B	75°C	

- (q) Explain your observations made on each of the test-tube separately.
- (r) Answer the following questions.
- What is an enzyme?
 - What is the optimum temperature for most enzymes?
 - What happens to enzyme when heated?
 - What conclusion can you draw from your experiment?

Question 3.

[4]

- (a) Take specimen D-42 and cut numerous transverse sections of the specimen with a sharp razor blade. Select a good section and stain it with safranin and amount it in glycerine. *Show your slide to the Visiting Examiner under a low power microscope.*
- (b) Draw a neat labeled diagram of the mount as seen under the low power microscope.
- (c) Answer the following questions.
- Identify the specimen D-42.
 - Give any *three* reasons for your identification.
 - What precaution should be taken for cutting a good transverse section.
Write any *two*.

Question 4.

Identify the given specimens **A** to **E** and give *two* reasons to support your answer in each case. Draw a neat labeled diagram for each specimen. You will be given *3 minutes* to identify, give reasons and draw a labeled diagram.