Question 1. **[6]**

(a) Examine the given specimen M-1 and answer the following.

(i) Describe the specimen in semi-technical terms based on the features mentioned below:

FEATURES	DESCRIPTION
Symmetry	
Sexuality	
Aestivation of calyx	
Placentation	

(ii) Carefully remove the calyx and corolla. Study the androecium and complete the table given below:

FEATURES	DESCRIPTION
Number of stamens	
Cohesion of stamen	
Nature of anther	
Attachment of anther to filament	

(iii) Cut the T.S of the ovary and *show it to the Visiting Examiner*. Draw a well labelled diagram.

(iv) Draw the floral diagram of the specimen.

(v) Name the family to which the specimen belongs. Justify with ***two*** points of identifications.

……

……

……

……

……

(b) Make a temporary stained mount of a transverse section of the given specimen **R-1** and observe it under a low power microscope. *Show it to the Visiting Examiner*. **[4]**

(i) Draw a neat labelled diagram of the mount.

(ii) Identify the given specimen with ***two*** points of identification.

……

……

……

……

Question 2. **[6]**

(a) 1. Conduct the experiment as per the instructions given below:

Materials required: Specimen P-1, S-1 and S-2 solutions, razor, forceps, dropper, brush, petri dish and microscope

Procedure:

(i) Take a fleshy leaf of specimen P-1 and a cut 1 cm^2 piece.

(ii) Using forceps, pull the epidermal layer from the concave side and place it on a glass slide.

(iii) Using proper staining techniques, stain the epidermal layer.

(iv) Add 2-3 drops of S-1 solution to it.

(v) Carefully place a cover slip.

(vi) Observe it under the microscope and record your observation in the table given below.

Observation Table

Type of solution used	**Sate of cell**	**Tonicity of solution**
S-1		
S-2		

(vii) Draw out the excess water with the help of blotting paper.

(viii) Place 2-3 drops of S-2 solution at the edge of the cover slip and let it 'wick' under the cover slip.

(ix) Keep it undisturbed for 4-5 minutes and observe it under a microscope. *Show it to the Visiting examiner.* Complete the Observation Table given in (vi).

2. Answer the following questions.

(i) What can you conclude from your observations?

……

……

……

……

……

……

……

(ii) Name and define the physiological process involved.

……

……

……

……

……

……

(iii) Give ***two*** significances of the above process in our day to day life.

……

……

……

……

……

……

……

……

(b) (i) Study specimens A and B and identify them giving ***two*** points of identification each. **[2]**

……

……

……

……

……

……

(ii) Classify the given specimens in the table given below: **[2]**

	SPECIMEN A	**SPECIMEN B**
Kingdom:		
Phylum/division:		
Class:		

Question 1. **[6]**

(a) Study the given specimen S-1 and answer the following questions.

(i) Cut the L.S of S-1 and display it. S*how it to the Visiting Examiner*. Draw a neat labelled diagram of it.

(ii) Take another specimen of S-1. Observe it and complete the table given below in semi-technical terms.

FEATURES	**DESCRIPTION**
Presence of pedicel	
Type of flower based on position of the ovary	
Aestivation of corolla	

(iii) Study the corolla of S-1 and complete the table given below:

FEATURES	DESCRIPTION
Number of petals	
Shape of corolla	

(iv) Draw a neat labelled diagram of the androecium of specimen S-1.

(v) Write the floral formula of S-1.

……

……

(vi) Name the family to which the specimen belongs.

……

……

(vii) How can you identify a flower belonging to the same family based on the floral characteristics? Mention any ***two*** key features.

……

……

……

……

……

……

(b) (i) Prepare a temporary slide of the T.S of the given specimen S-2. You are expected to provide information on the following: **[4]**

- Materials required
- Procedure

……

……

……

……

……

……

……

……

……

……

……

……

……

……

(ii) Observe the T.S of S-2 under the low power objective of a compound microscope and *show it to the Visiting Examiner*. *C*omplete the table given below:

FEATURES	**DESCRIPTION**
Organization of ground tissue	
Number of vascular bundles	
Type of xylem bundle	

(iii) Identify specimen S-2 and give ***two*** points of identifications.

……

……

……

……

Question 2.

(a) 1. Conduct the experiment as per the instructions given below: **[6]**

Materials required: Specimen S-3, scalpel, 2 nos. petri dish S-P solution, blotting paper, beaker, forceps and ruler.

Procedure:

(i) Remove the skin of S-3.

(ii) Cut S-3 in cuboidal blocks of the following measures:

Dimensions	**Measurement**
Length	4 cm
Breadth	2 cm
Height	1 cm

(iii) Pour S-P solution in a petri dish.

(iv) Immerse the cuboidal block of S-3 fully in S-P solution.

(v) Cover it with the other petri dish. *Show it to the Visiting Examiner*.

(vi) Leave the set-up undisturbed for about an hour.

(vii) Take out the cuboidal block from the petri dish and place it on blotting paper to remove the excess solution.

(viii) Measure the final dimensions of the cuboidal block and complete the observation table given below:

Observation Table

Dimensions	**Initial measurement**	**Final measurement**	**Difference in measurement**
Length	4 cm		
Breadth	2 cm		
Height	1 cm		

2. Answer the following questions:

(i) From the observation table, comment on the tonicity of S-P solution with respect to cell sap of specimen S-3.

……

……

……

……

(ii) What happened to the texture of the cuboidal block after placing it in S-P solution?

……

……

……

……

……

(iii) Why is the skin of S-3 removed before performing the experiment?

……

……

……

……

……

……

(iv) Name the condition of the cells after an hour.

……

……

(v) Define the condition.

……

……

……

……

……

(vi) Mention ***four*** practical applications of this condition in plants.

……

……

……

……

……

……

……

……

(b) (i) Study specimens X and Y. Give ***two*** characteristic features of each and identify them. **[2]**

……

……

……

……

……

……

(ii) Complete the table given below: **[2]**

	Kingdom	Phylum/division	Class
SPECIMEN X			
SPECIMEN Y			

Question 1. **[6]**

(a) Study the given specimen C-41 and answer the following.

(i) Describe the external morphology of C-41 in semi-technical terms in the table given below.

FEATURES	**DESCRIPTION**
Presence/absence of bract	
Presence/absence of stalk	
Completeness	

(ii) With the help of forceps remove the corolla from C-41 and tabulate its characteristics in the table given below.

.**FEATURES**	**DESCRIPTION**
Number of petals	
Cohesion of petals	
Aestivation of petals	
Shape of corolla	

(iii) (a) Take a pistil, cut the ovary transversely and draw a well labeled diagram.

(b) Comment on the following features of C-41.

FEATURES	DESCRIPTION
Number of carpel	
Cohesion of carpel	
Shape of stigma	
Number of locules	

(iv) Take another sample of C-41 and with the help of a sharp razor blade, cut a longitudinal section of C-41. *Show the section to the Visiting Examiner.*

(v) Write the floral floral formula of C-41.

……

……

(vi) Write ***two*** economic importance of the family of C-41.

……

……

……

……

(vii) Mention the scientific names of any ***two*** plants belonging to the family of specimen C-41.

……

……

(b) Study specimens S-11 and S-22 and answer the questions that follow. **[4]**

(i) Identify the specimens S-11 and S-22.

……

……

(ii) Draw a well labeled diagram of each specimen.

(iii) Give ***two*** significant features of specimen S-11 and S-22 each.

……

……

……

……

……

……

……

……

……

……

……

……

Question 2. **[6]**

(a) 1. You are provided with the following materials:

Sample C-42, solutions A and B, glass slides, cover slips, brush, microscope, droppers, petri dish / watch glass and test tubes.

Carry out the experiment as given below:

(i) Remove a few square pieces of lower epidermis from C-42 with the help of forceps.

(ii) Cut it into small pieces measuring approximately 4 mm × 4 mm.

(iii) Take two clean dry glass slides and label them as A and B.

(iv) Drop solution A on slide A and solution B on slide B using different droppers.

(v) Transfer a piece of lower epidermis to slide A.

(vi) Repeat procedure (v) for slide B.

(vii) Mount both samples with cover slips and leave the slides undisturbed for 10-15 minutes. Observe under microscope and *show it to the Visiting Examiner.*

(viii) Draw a labeled diagram of the mount on '**slide B'** as seen under microscope.

(ix) Record your observation in the table given below.

Slides	**Observation**	**Tonicity of the solution**
A		
B		

2. Answer the following questions:

(i) What is the aim of the experiment?

……

……

……

……

(ii) State the principle on which the experiment works.

……

……

……

……

(iii) Write ***one*** similarity observed between slide A and slide B and comment on the observation made.

……

……

……

……

(iv) What will happen if a plasmolysed cell is placed in a hypotonic solution?

……

……

……

……

(v) What will happen if sample C-42 is replaced by a dry leaf?

……

……

……

……

……

……

(vi) Write ***one*** significance of this process in plants.

……

……

……

……

(b) 1. Make a temporary stained mount of the transverse section of the given specimen S-33. **[4]**

Follow the procedure given below:

(i) Cut thin transverse sections of S-33.

(ii) Select a good section and stain it.

(iii) Mount it on a slide. Observe under microscope and *show it to the Visiting Examiner*.

2. Answer the following questions.

(i) Which stain did you use? What is the purpose of staining?

……

……

……

……

……

(ii) Why do you use a cover slip when making a wet mount?

……

……

……

……

……

(iii) Explain ***two*** significances of using mounting medium in preparation of slides.

……

……

……

……

……

(iv) Write ***two*** precautions that you followed during the experiment.

……

……

……

……

(v) What is the advantage of preparing temporary slides over permanent slides?

……

……

……

……

……

……

……