



**FEDERAL BOARD OF INTERMEDIATE
AND SECONDARY EDUCATION
H-8/4, ISLAMABAD**



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NOTIFICATION

Assessment Frameworks for Practical Based Assessment (PBA) containing lists of experiments/practicals along with instructions and Model Question Papers (Composite) in the subjects of Physics, Chemistry, Biology and Computer Science at SSC and HSSC levels based on National Curriculum of Pakistan 2022-23 (Scheme of Studies 2006) are hereby notified for implementation with effect from Annual Examinations 2026 and onwards.

2. The Assessment Frameworks for Composite PBA (Scheme of Studies 2006) are available at FBISE website. The weblink is https://www.fbise.edu.pk/curriculum_model_paper.php.

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ASSESSMENT FRAMEWORK FOR PRACTICAL BASED ASSESSMENT (PBA) - COMPOSITE

BIOLOGY SSC LEVEL



NATIONAL CURRICULUM OF PAKISTAN (2022-23)

SCHEME OF STUDIES 2006

WE WORK FOR EXCELLENCE

**FEDERAL BOARD OF INTERMEDIATE AND SECONDARY
EDUCATION (FBISE), ISLAMABAD**



Table of Contents

<u>S. No</u>	<u>Contents</u>	<u>Page No.</u>
1.	Acknowledgement	1
2.	About the PBA Assessment Framework	2
3.	Guidelines/instructions for teachers/paper setters	3
4.	List of Experiments aligned with SLOs (Composite PBA)	4
5.	Model Question Paper Biology SSC (COMPOSITE)	6

ACKNOWLEDGEMENT

It is a great honour that we at the Federal Board of Intermediate and Secondary Education (FBISE) have developed the Assessment Framework (AF) for the Practical Based Assessment (PBA) of Biology at the Secondary School Certificate (SSC) level. The primary objective of the Assessment Framework is to optimize the Student Learning Outcomes (SLOs) of curriculum 2022-23 that are associated with practical concepts and laboratory work. This comprehensive framework has been crafted meticulously by subject matter and assessment experts who conducted an in-depth review of all learning outcomes of SSC level Biology curriculum.

This significant undertaking was the result of a series of extensive meetings and collaborative efforts of the subject and assessment experts. Their dedication and expertise have been instrumental in bringing this framework to fruition.

The Assessment Framework for Practical Based Assessment (PBA) will serve as a guiding document for students, teachers, and paper setters. Students will receive clear directions for preparing themselves for the PBA examinations. Similarly, teachers will use it as a guide to perform laboratory work and to prepare students for the final PBA examinations. Paper setters of PBA will also seek guidance from this document and prepare PBA paper accordingly for annual examinations. It may be noted that only those students will be able to attempt the PBA paper who have performed all the practicals in laboratory.

Following subject as well as assessment experts remained constantly engaged in the development of the Assessment Framework for PBA:

1. Dr. Muhammad Ilyas, Associate Professor, Islamabad Model College for Boys, G-10/4, Islamabad
2. Ms. Ruqayya Shaikh, Associate Professor, Islamabad Model College for Girls, F-6/2, Islamabad
3. Dr. Kashif Ali, Associate Professor, Islamabad Model College for Boys, F-7/3, Islamabad
4. Mrs. Samina Tahira, Associate Professor, Islamabad Model College for Girls, I-8/4, Islamabad
5. Dr. Abid Ali Mughal, Associate Professor, Islamabad Model College for Boys, H-9, Islamabad

The whole work was successfully accomplished under the able supervision and guidance of Dr. Ikram Ali Malik, Chairman, FBISE and due to the hard work and dedication of the staff of Research Section of FBISE, in particular, Syed Zulfiqar Shah, Deputy Secretary, Research and Academics who played pivotal role in finalizing the Assessment Framework for PBA.

MIRZA ALI
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ABOUT THE PBA ASSESSMENT FRAMEWORK

To ensure clarity and precision in the understanding of Practical Based Assessment (PBA) Question Paper, the Student Learning Outcomes (SLOs) have been categorized into two distinct groups: formative for PBA and summative for PBA in the separately composed Assessment Frameworks for Classes SSC-I and SSC-II. Subsequently, all the SLOs of SSC-I and SSC-II meant for summative PBA have been translated into workable and functional composite lists of major and minor experiments which are part of this booklet. This extraction of lists of experiments helps in effectively measuring student progress and understanding of the scientific concepts linked with laboratory work. These experiments must be performed by the students under the supervision of their teachers in the laboratories in order to prepare themselves for the PBA Examinations.

The Assessment Framework for Practical Based Assessment (PBA) will act as a comprehensive guide for students, teachers, and paper setters. Students will receive clear instructions in order to perform experiments in the laboratory and prepare themselves for the PBA examination. Teachers will use the same to strategize the optimal use of the laboratory for performing experiments (major and minor).

The Model Question Paper for Practical Based Assessment (PBA), along with clear instructions, has also been developed and made part of this booklet to provide a structured format for upcoming examinations. The model question paper ensures consistency and fairness, offering students a comprehensive understanding of PBA examination.

All the experiments have been aligned with their corresponding SLOs marked summative for PBA. The purpose of this alignment is to explain how the experiments relate with their corresponding summative SLOs for PBA.

Instructions for paper setters have also been included before the PBA model question paper, providing self-explanatory guidance on the selection and nature of each question which is part of the model paper.



PRACTICAL BASED ASSESSMENT (PBA)
COMPOSITE

Biology SSC Level for Annual Examination 2026 & onwards
Biology Curriculum (2022-23)-Scheme of Studies 2006



Guidelines/instructions for teachers/paper setters:

- i. The paper will consist of two sections i.e section A and B.
- ii. Section A will include Major Practicals. This section will have two questions, each question carrying 6 marks having parts in it, and each question will be performance / calculation/procedures/observations based encompassing a single practical.
- iii. Section B will include Minor Practicals. This section will also have two questions, each carrying 4 marks having parts in it. Each question may be based on single or multiple practicals.
- iv. The weightage of section A will be 60% i.e 12 marks, while that of section B will be 40 % i.e 8 marks.
- v. In Practical Based Assessment (PBA), there will be no marks for practical notebooks and viva voce. However, students may record procedures, observations, apparatus and calculation etc on any type of plain papers/work sheets / practical folders for their future memory of all aspects of practical performance in order to attempt the PBA Examination amicably.
- vi. It may be noted that performance of all the prescribed practicals is mandatory in the laboratory during the whole academic session because only those students will be able to attempt the PBA who have performed the practicals in the laboratory as per requirement of each practical.
- vii. MCQs will not be included/assessed in the Practical Based Assessment paper.
- viii. Questions carrying 0.5 marks will not be included/assessed as single part in any section of the PBA paper.



**List of Experiments aligned with SLOs (Composite PBA)
For SSC Annual Examination 2026 & onwards
Biology Curriculum (2022-23)-Scheme of Studies 2006**



Note: In the Practical-Based Assessment (PBA), questions will be taken/developed from the list of experiments provided below, aligned with the summative SLOs listed in the corresponding column.

Section A (60% of practical marks — 12 Marks)

No.	List of Experiments	Aligned SLOs
Major Practicals	<ol style="list-style-type: none"> 1. Qualitative tests for different types of energy food (Iodine test for starch, Benedict's test for glucose, Biuret test for protein, Emulsion test for fatty substance). 2. To study the effect of temperature and pH rate of enzyme-catalyzed reaction. 3. To study the rate of photosynthesis using hydrogen carbonate indicator/ disc method. 4. To study the effect of limiting factors (temperature and carbon dioxide) on rate of photosynthesis. 5. To study the effect of minerals ions (Nitrogen and magnesium) on growth of plants. 6. To study the process of transpiration in plants using cobalt chloride paper. 7. To investigate that exhaled air contains Carbon dioxide. 8. To study the effect of exercise on heart rate and breathing rate. 9. To study the tropic responses (phototropism and geotropism) in plants. 10. To study the reaction time response. 	<p>[SLO: B-09-10-X-02] Students should be able to carry out simple experiments of:</p> <ul style="list-style-type: none"> • food tests • rate of enzyme-catalyzed reaction • use of hydrogen carbonate indicator • photosynthesis • effect of mineral ions on plant growth • transpiration • respiration • heart rate and breathing rate • tropic responses • nervous responses

Section B (40% of practical marks — 8 Marks)

Minor Practicals	<ol style="list-style-type: none"> 1. To study factors affecting rate of diffusion. 2. To study osmosis using potato strips. 3. To dissect the seeds (Monocot and dicot seeds) 4. To dissect the flowers (Monocot and dicot seeds). 5. To study the germination of seeds (epigeal and hypogeal germination). 6. To study continuous and discontinuous variation (human height and tongue rolling) 	<p>[SLO: B-09-10-X-02] Students should be able to carry out simple experiments of:</p> <ul style="list-style-type: none"> • diffusion • osmosis • observation and dissection of seeds and flowers • germination • continuous and discontinuous variation • sampling techniques
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7. To study the ecosystem by using sampling technique (Quadrat method)	
8. Use of a microscope to study cells: Protista (Amoeba, Paramecium, Volvox and Euglena, Chlamydomonas), Animal cells (Human cheek cells), Plant cells (Onion epidermis) 9. To study animal tissue (epithelial, connective, muscle and nervous tissues) using prepared slides and charts. 10. To study plant tissues (Epidermal, vascular, photosynthetic and supporting tissues) using prepared slides and charts.	[SLO: B-09-10-X-03] Should be able to use of a microscope to examine biological specimens
11. Calculation of magnification, image size or actual size of specimen from provided data.	[SLO: B-09-10-X-04] Calculating the magnification of biological specimens (by using microscope)

Total Marks: 20

Time: 2 hours

Note: Attempt all questions and write answers within provided spaces on E-Sheet.

SECTION A (6 x 2 = 12)

Q.1 A student carried out biochemical tests on the given food material to find out its nutrient contents.

a) Re-draw table 1.1 on E-sheet and complete with required information. [3]

Table: 1.1		
Reagent	Used to test	Observations
Absolute ethanol and cold water		
	Protein	
Benedict's solution		

b) A student's test on food sample gives colour change with iodine. Does it indicate anything about the presence of glucose in the sample? If your answer is no, then, which biochemical test would the student have to perform to find out about the presence of glucose? [2]

c) Identify the enzyme catalyzing the reaction shown in figure 1.1? [1]

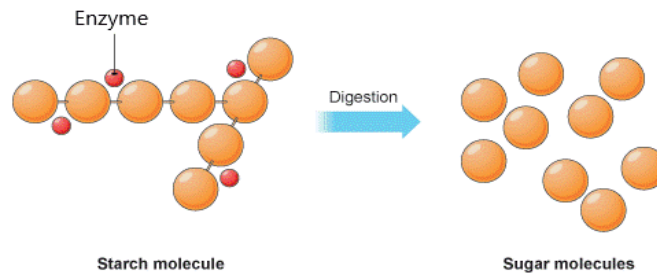


Figure: 1.1

Q2. A pot with a small plant was placed horizontally in dark condition. After few days, roots bended downwards and shoot grew upwards.

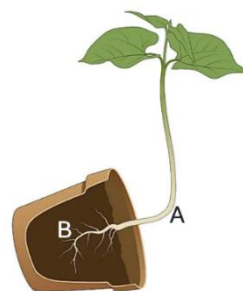


Figure: 2.1

a) Identify the plant movements shown at point A and B in figure 2.1 and define them? [2]

- b) Relate these movements shown in figure 2.1 with the type of stimuli. [1]
- c) Give one benefit of each type of movement to the plant shown in above figure? [2]
- d) Name any other type of tropic movement in plants. [1]

SECTION-B (8 Marks)

Q.3

- a) Identify which type of germination is shown in figure 3.1. Identify labelled parts A, B and C. [2]



Figure: 3.1

- b) Identify the organism shown in figure 3.2. [1]



Figure: 3.2

- c) Identify the type of plant tissue shown in figure 3.3. [1]

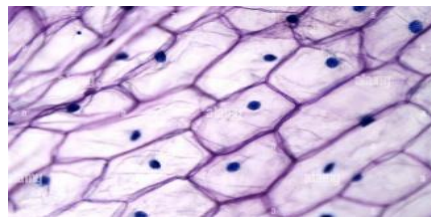


Figure: 3.3

Q.4

- a) The following diagram shows diffusion of ink in two glasses of water at different temperatures. Which glass will show faster diffusion? Give a reason for your answer. [2]

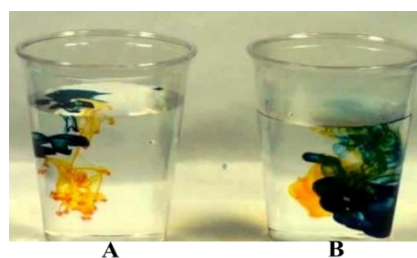


Figure: 4.1

- b) While recording the height of your classmates, you obtained the data given in table 4.1 and draw a histogram using your scale to represent this data. [2]

Height range in inches	Number of students
59-60	2
61-62	5
63-64	12
65-66	18
67-68	9
69-70	3
71-72	1



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