

## Plan of Written Examination

All the aspirants are informed as under with respect to the written test to be conducted for the recruitment of **Scientific Assistant**:-

- (i) The Exam will be conducted in MCQ (Multiple Choice Questions) format. OMR sheets will be used for answering the questions.
- (ii) There will be negative marking. Each question carries 1 mark. **For every wrong answer, 1/4<sup>th</sup> mark would be deducted. The question(s) not attempted will receive no credit or discredit.**
- (iii) The test would be of 2 hours duration.
- iv) Pattern of the written competitive examination is as follows:-

Sr. No.	Topic	No. of Questions	Marks (Each Question carries 1 mark)	Type of Questions
1.	Questions from the Subject (Part A of Syllabus)	90	90	MCQs (Multiple Choice Questions)
2.	Questions from General Knowledge, English, Punjabi, Logical Reasoning and Mental ability (Part B of Syllabus)	30	30	
<b>Total</b>		<b>120</b>	<b>120</b>	

- v) Tentative syllabus for the written examination for the recruitment of **Scientific Assistant** is annexed at Annexure-1 and 2

## **Annexure-I**

### **Syllabus Part-A**

#### **(Post- Scientific Assistant)**

- Origin and evolution of life: origin of primitive cell and eukaryotic cell. Types of cell, organization of prokaryotic and eukaryotic cells. Microscopic techniques: light and phase contrast microscopy, Electron microscopy (TEM and SEM), Fixation and staining techniques.
- Structure and function of cell organelles, ultrastructure of cell membrane, cytosol, Golgi bodies, endoplasmic reticulum (rough and smooth), ribosomes, cytoskeletal structures (actin, microtubules etc.), Mitochondria, chloroplasts, lysosomes, peroxysomes, nucleus (nuclear membrane, nucleoplasm, nucleolus, chromatin).
- Cell Division and Cell Cycle: mitosis, meiosis, stages of cell cycle, binary fission, Mitosis and its regulation.
- Molecular basis of life. Structure of DNA. DNA replication in both prokaryotes and eukaryotes, Transcription and translation. DNA recombination molecular mechanisms: prokaryotic and eukaryotic. Insertion elements and transposons, conjugation and transduction.
- Principles of living organisms; Elements of living organisms; Biomolecules Carbohydrates, Lipids, Proteins, Nucleic acid and vitamins, Classification of biomolecules; Structure and functions of various biomolecules.
- Bioenergetics and Metabolism: Different pathways (EMP, HMP, ED etc ) for catabolism of glucose, fixation of carbon by Calvin cycle. Enzymes: Nomenclature, Classification and Characteristics of enzymes, Enzyme Kinetics: Michaelis Menten equation, significance of  $K_m$  and  $V_{max}$  values, Enzyme inhibition: reversible and irreversible inhibition, Allosteric enzymes
- Introduction to Hematology: Definition and significance of hematology, Blood and its various components, • Immune response: antigens,

antibodies, cell mediated immunity, immune system T and B lymphocytes, generations of antibody diversity, monoclonal antibodies.

- Ecological interactions: commensalism, amensalism, symbiosis, parasitism and predation. Pathogens and control measures.

## Annexure-2

### Part B Syllabus

**General Knowledge, English, Punjabi, Logical Reasoning and Mental Ability.**

<b>Sr. No.</b>	<b>Indicative Contents of Syllabus</b>	<b>Weightage (Approx.)</b>
1	<p><b>General Knowledge and Current affairs of National and International importance including:</b></p> <ul style="list-style-type: none"><li>(i) Political issues,</li><li>(ii) Environment issues,</li><li>(iii) Current Affairs,</li><li>(iv) Science and Technology,</li><li>(v) Economic issues,</li><li>(vi) History of Punjab-14<sup>th</sup> century onwards</li><li>(vii) History of India with special reference to Indian freedom struggle movement.</li><li>(viii) Sports,</li><li>(ix) Cinema and Literature.</li></ul>	10
2	<p><b>Logical Reasoning &amp; Mental Ability:</b></p> <p>Verbal reasoning: Coding, Decoding, Analogy, Classification, Series, Direction sense test, relations, mathematical operations, time test, odd man out problems.</p> <p>Non Verbal reasoning: Series, Analogy and Classification.</p> <p>Basic numerical skills, Percentage, Number system, LCM and HCF, Ratio and Proportion, Number series, Average, Problems based on Ages, Profit &amp; Loss, Partnership and Mixture, Simple and Compound Interest, Work and Time, Time and Distance. Mensuration and Data Interpretation.</p>	10

3	<p><b>English:-</b></p> <p>Basic Grammar, Subject and Verb, Adjectives and Adverbs, Synonyms, Antonyms, One Word Substitution, Fill in the Blanks, Correction in Sentences, Idioms and their meanings, Spell Checks, Adjectives, Articles, Prepositions, Direct and Indirect Speech, Active and Passive Voice, Correction in Sentences, etc.</p>	5
4	<p><b>ਪੰਜਾਬੀ:-</b></p> <p>ਸ਼ੁੱਧ-ਅਸ਼ੁੱਧ, ਸ਼ਬਦਜੋੜ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ, ਸਮਾਨਾਰਥਕ/ਵਿਰੋਧੀ ਸ਼ਬਦ, ਨਾਂਵ, ਪੜਨਾਂਵ ਅਤੇ ਕਿਰਿਆ ਦੀਆਂ ਕਿਸਮਾਂ ਤੇ ਸਹੀ ਵਰਤੋਂ, ਲਿੰਗ ਅਤੇ ਵਚਨ, ਪੰਜਾਬੀ ਅਖਾਣ ਤੇ ਮੁਹਾਵਰੇ, ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ ਅਨੁਵਾਦ ਅਤੇ ਬਹੁਤੇ ਸ਼ਬਦਾਂ ਦੀ ਥਾਂ ਇੱਕ ਸ਼ਬਦ ਆਦਿ।</p>	5
	<b>Maximum Marks</b>	30

Note:-a) The distribution of marks/question in each section is indicative. It may vary slightly.

b) The syllabus is broadly classified as above but may vary to some extent.