Plan of Written Examination

*All the aspirants are informed as under with respect to the written test to be conducted for the recruitment for the post of **Research Assistant(Grade A) (Advt. No. 13 of 2023)** :-*

1. The Exam will be conducted in MCQ (Multiple Choice Questions) format. OMR sheet will be used for answering the questions.

2. The Exam would be of 2 hours duration.

3. The Exam will consist of two parts (Part A and Part B) as follows:-

Part	Topic	No. of Questions	Marks (Each Question carries 1 mark)	Type of Questions
A	Questions from General Knowledge and Current Affairs, Punjab History and Culture, Logical Reasoning and Mental ability, Punjabi, English, ICT, (Annexure-1)	40	40	MCQs (Multiple Choice Questions)
B	Questions from the Subject (Annexure-2)	80	80	MCQs (Multiple Choice Questions)
Total		120	120	

4. ***There will be negative marking. Each question carries 1 mark. For every wrong answer, 1/4th mark i.e. 0.25 mark would be deducted. The question(s) not attempted will receive no credit or discredit.***

5. *Syllabus for the written examination for the recruitment of **Research Assistant(Grade A) (Advt. No. 13 of 2023)** is annexed at Annexure-1 and Annexure-2.*

Annexure - 1

Part A - General Knowledge, *Punjab History and Culture*, Logical Reasoning Mental Ability, Punjabi, English and ICT.

Sr. No.	Indicative Contents of Syllabus	Weightage (Approx.)
1.	**General Knowledge and Current affairs of National and International importance including:** (i) Polity issues, (ii) Environment issues, (iii) Current Affairs, (iv) Science and Technology, (v) Economic issues, (vi) History of India with special reference to Indian freedom struggle movement. (vii) Sports, (viii) Cinema and Literature. (ix) Geography	10
2.	**Punjab History and Culture:-** Physical features of Punjab and its ancient history. Social, religious and economic life in Punjab. Development of Language & literature and Arts in Punjab, Social and culture of Punjab during Afgan/Mughal Rule, Bhakti Movement, Sufism, Teachings/History of Sikh Gurus and Saints in Punjab. Adi Granth, Sikh Rulers, Freedom movements of Punjab.	5
3.	**Logical Reasoning & Mental Ability:** (i) Logical reasoning, analytical and mental ability.(05 Marks) (ii) Basic numerical skills, numbers, magnitudes, percentage, numerical relation appreciation. (03 Marks) (iii) Data analysis, Graphic presentation charts, tables, spreadsheets. (02 Marks)	10
4.	**ਪੰਜਾਬੀ:-** ਸੁੱਧ-ਅਸੁੱਧ, ਸ਼ਬਦਜੋੜ, ਅਗੇਤਰ ਅਤੇ ਪਿਛੇਤਰ, ਸਮਾਨਾਰਥਕ/ਵਿਰੋਧੀਸ਼ਬਦ, ਨਾਂਵ, ਪੜਨਾਂਵ ਅਤੇ ਕਿਰਿਆ ਦੀਆਂ ਕਿਸਮਾਂ ਤੇ ਸਹੀ ਵਰਤੋਂ, ਲਿੰਗ ਅਤੇ ਵਚਨ, ਪੰਜਾਬੀ ਅਖਾਣ ਤੇ ਮੁਹਾਵਰੇ, ਅੰਗਰੇਜੀ ਤੋਂ ਪੰਜਾਬੀ ਅਨੁਵਾਦ ਅਤੇ ਬਹੁਤੇ ਸ਼ਬਦਾਂ ਦੀ ਥਾਂ ਇੱਕ ਸ਼ਬਦ ਆਦਿ।	5
5.	**English:-** 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.	5
6.	**ICT:-** Basics of computers, Network & Internet, Use of office productivity tools Word, Excel, Spreadsheet & PowerPoint.	5
	Maximum Marks	40

Part B - Subject Syllabus for the post of Research Assistant(Grade A)

Number of Questions 80   **Maximum Marks- 80**

1. PHYSICS

Units and Measurements, Mechanics, Electricity and Magnetism, Relativity and Electromagnetism, Electromagnetic Induction and alternating current, Vibration and Waves, Statistical Physics and Thermodynamics, Optics and lasers, Wave Optics, Quantum Mechanics, Atomic and Molecular Spectra, Dual nature of matter and radiation. Atoms and nuclei, Condensed Matter Physics, Electronics, Radiation and Particle Physics, Nuclear Physics, Kinematics, Motion in a plane, Laws of Motion, Motion of System of Particles and Rigid Body, Electrostatics, Current Electricity, Electronic Devices, Works Energy Power, Gravitation, Properties of Bulk Matter, Behaviour of perfect Gas and Kinetic Theory of gases, Oscillation and waves.

2. CHEMISTRY

Atomic Structure, Periodic Properties, Chemical Bonding & Molecular Structure, Chemical Thermodynamics, Equilibrium, Redox Reactions, Hydrocarbons, Solutions, Electrochemistry, Chemical Kinetics, s-Block Elements, p- Block Elements, d & f block elements, Ionic Solids, Mechanism of Organic Reaction, Alkanes, Alkenes and Alkynes, Alkyl and Aryl Halides, Cycloalkanes, Arenes and Aromaticity, Acid and Bases, Chemistry of Transition Elements, Gaseous. States, Liquid State, Colloidal State, Solutions, Dilute Solutions and Colligative Properties, Stereochemistry Organic Compounds, Alcohol, Phenols, Aldehydes and ketones, Thermodynamics, Equilibrium, Coordination Compounds, Non- Aqueous Solvents, Oxidation and Reduction, Chemistry of Lanthanide Elements, Chemistry of Actinides, Bioinorganic Chemistry, Carboxylic Acid, Carboxylic Acid Derivatives, Ether and Epoxides, Organic Compounds of Nitrogen, Organometalic Compounds, Heterocyclic Compounds, Metal- ligand Bonding in Transition Metal Complexes, Magnetic Properties of Transition Metal Complexes, Thermodynamic and Kinetic Aspects of Metal Complexes, Electronic Spectra of Transition Metal Complexes, Organometalic Compounds, Electrochemistry, Nuclear Chemistry, Spectroscopy, Rotational Spectrum, Vibrational Spectrum, Electronic Spectrum, Spectroscopy, Electromagnetic Spectrum, Problem Based on spectroscopy, Organosulphur Compounds, Synthetic Polymers, Organic

Synthesis via Enolates, Carbohydrates, Amino, Acids, Peptides, Proteins and Nucleic acids, Quantum Mechanics, Solid State, Photochemistry.

3. Mathematics

Algebra, Calculus and Trigonometry, Calculus and Differential Equations, Calculus, Analysis, Analytical Geometry, Statics and Vector Calculus, Solid Geometry, Dynamics, Number Theory, Linear Algebra, Numerical Analysis, Integrals, Application of Integrals Differential Equations, Vectors And Three Dimensional Geometry, Linear Programming, Coordinate Geometry, Sets and functions, relation and functions, Co-ordinate Geometry, Probability, Determinants.

4. Computer Awareness

(i) About Ms-excel.

(ii) Geographical Information System(Arc GIS, Google Earth and related Software).