

Final Plan of Written Examination

All the aspirants are informed as under with respect to the written test to be conducted for the recruitment of **Laboratory Technician (Fisheries Department) (Advt. No. 16 of 2022)** :-

1. The Exam will be conducted in MCQ (Multiple Choice Questions) format. OMR sheets will be used for answering the questions.
2. The Exam would be of 2 hours 30 minutes duration.
3. The Exam will consist of two parts (Part A and Part B) as follows:-

(a) **Part A:-** Qualifying test of Punjabi Language equivalent to Matriculation standard as per Notification No. G.S.R.72 / Const. / Art.309/Amd.(22)/2022, dated:28.10.2022.

Part	Topic	No. of Questions	Marks (Each Question carries 1 mark)	Type of Questions
A	Punjabi (Qualifying Nature) (Annexure-1)	50	50	MCQs (Multiple Choice Questions)

Note:- (i) There will be no negative marking in Part-A.

(ii) Part 'B' will be evaluated only if a candidate scores minimum 50% marks (i.e 25 marks) in Part 'A'.

(b) **Part-B:-** Part-B will consist of two sub-sections i.e Section (I) and Section (II) as following:-

Part	Section	Topic	No. of Questions	Marks (Each Question carries 1 mark)	Type of Questions
B	(I)	Questions from the Subject (Annexure-2)	70	70	MCQs (Multiple Choice Questions)
	(II)	Questions from General Knowledge, English, Logical Reasoning and Mental ability, Punjabi (Annexure-3)	30	30	
Total			100	100	

Note:-(i) There will be negative marking in Part-B. Each question carries 1 mark. For every wrong answer, 1/4th mark would be deducted. The question(s) not attempted will receive no credit or discredit.

(ii) The merit list of candidates, who will qualify Part-'A', will be prepared on the basis of marks secured by candidate in Part-B.

4. Tentative syllabus for the written examination for the recruitment of Laboratory Technician (Fisheries Department) is annexed at Annexure-1,2 and 3.

Annexure-1 (Punjabi Syllabus)
Part-A (Punjabi Qualifying Exam)

1. ਜੀਵਨੀ ਅਤੇ ਰਚਨਾਵਾਂ ਨਾਲ ਸਬੰਧਤ ਪ੍ਰਸ਼ਨ:-
ਸ੍ਰੀ ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਜੀ, ਸ੍ਰੀ ਗੁਰੂ ਅੰਗਦ ਦੇਵ ਜੀ, ਸ੍ਰੀ ਗੁਰੂ ਰਾਮਦਾਸ ਜੀ,
ਸ੍ਰੀ ਗੁਰੂ ਅਰਜਨ ਦੇਵ ਜੀ, ਸ੍ਰੀ ਗੁਰੂ ਤੇਗ ਬਹਾਦਰ ਜੀ, ਸ੍ਰੀ ਗੁਰੂ ਗੋਬਿੰਦ ਸਿੰਘ ਜੀ।
2. ਵਿਰੋਧਾਰਥਕ ਸ਼ਬਦ, ਸਮਾਨਾਰਥਕ ਸ਼ਬਦ।
3. ਮੁਹਾਵਰੇ।
4. ਅਖਾਣ।
5. ਸ਼ਬਦ ਦੇ ਭੇਦ।
6. ਅਗੇਤਰ/ਪਿਛੇਤਰ।
7. ਵਚਨ ਬਦਲੇ ਤੇ ਲਿੰਗ ਬਦਲੇ।
8. ਵਿਸ਼ਰਾਮ ਚਿੰਨ੍ਹ।
9. ਸ਼ਬਦਾਂ / ਵਾਕਾਂ ਨੂੰ ਸੁੱਧ ਕਰਕੇ ਲਿਖੋ।
10. ਅੰਗਰੇਜ਼ੀ ਸ਼ਬਦਾਂ ਦਾ ਪੰਜਾਬੀ ਵਿੱਚ ਸੁੱਧ ਰੂਪ।
11. ਅੰਕਾਂ, ਮਹੀਨੇ, ਦਿਨਾਂ ਦਾ ਸੁੱਧ ਪੰਜਾਬੀ ਰੂਪ।
12. ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨਾਲ ਸਬੰਧਤ ਪ੍ਰਸ਼ਨ।
13. ਪੰਜਾਬ ਦੇ ਇਤਿਹਾਸ ਨਾਲ ਸਬੰਧਤ ਪ੍ਰਸ਼ਨ।
14. ਪੰਜਾਬ ਦੇ ਸਭਿਆਚਾਰ ਨਾਲ ਸਬੰਧਤ ਪ੍ਰਸ਼ਨ।

Annexure-2

Part B (I)-Subject Syllabus (Laboratory Technician) (Fisheries Department)

Anatomy and Physiology

Skeletal system, Digestive system, Respiratory system, Cardio-vascular system, Excretory System, Reproductive System, Nervous System, Endocrine System of Fish and Shellfish.

Biochemistry

Introduction and scope of Biochemistry, cleaning and care of laboratory glass ware and equipments, preparation and storage of distilled water, analytical balance, calorimeter, spectrophotometer, pH Meter, flame photometer, S.I unit of measurement, Preservation and disposal of biological sample, Basic statistic- mean, median, modes, SD, CV, normal reference ranges. Acid and base, pH, buffer solution, indicator, standard solution, storage of chemicals, water electrolytes, acid base balance .

- Carbohydrate, Lipids, Proteins Amino acids, Nucleic Acids, Enzymes, Co-Enzymes , Amino acid, Vitamins, Mineral- classification, definition, biological role, deficiency state, functions.
- Glycolysis, TCA-cycle, Electron transport chain, Pentose Phosphate Pathway, Glyconeogenesis, Gluconeogenesis, Cori-cyle, Blood sugar and its regulation.
- Fatty acid, cholesterol, lipoproteins, purine ribonucleotide-biosynthesis utilization, ketone bodies formation and its utilization.
- Transamination, Deamination, Biological importance of catecholamine, GABA, Serotonin, Histamine, Melanin.
- Qualitative and Quantitative test for - Carbohydrates, lipids, proteins.
- Estimation of Serum electrolytes and bicarbonates Blood Sugar.

Radio Immuno Assay (RIA)

- Enzyme Link Immunosorbent Assay (ELISA)
- Chromatography (thin layer paper, gas, liquid Electrophoresis, (gel electrophoresis, liquid electrophoresis)

Microbiology

- Origin of microbial life - theory of spontaneous generation.
- Safety measures in microbiology
- Classifications and nomenclature of bacteria (five kingdom concept)
- Sterilization-Principle, methods, antiseptic, disinfect.
- General characteristic and anatomy of bacteria (shape, size, components)
- Growth and nutrition of bacteria, classification of bacteria on the basis of nutritional requirement, measurement of cell mass and factor affecting growth.
- Cultivation of microbes (Bacteria)
- Culture technique (media preparation and inoculation)
- Isolation of Pure culture (streak plate, spread plate , pours plate, serial dilution)
- Bacteriology, Normal Micro flora of human body, Germ theory of diseases, microbial infection (types, sources and transmission)

- Bacterial toxin (Endotoxin & exotoxin)
- Bacterial morphology, isolation, identification , pathogenicity , lab diagnosis
- Collection, preservation, transportation of clinical specimens for microbial investigation, bacteriological methods of examination of fish blood.
- Antibiotic sensitivity test (Disc diffusion and broth dilution methods)

Instruments & Glass ware :

- Autoclave , Incubator , Laminar Airflow , Hot air oven , Water bath , Vortex shaker ,
Petri dish , Test tube , Screw cap tube , Glass spreader/L - rods ,
Pasteur pipettes .

Medical Mycology :

- Classification and nomenclature of fungi,
- General characteristics, structures, reproduction, cultivation
- Medically important Division of fungi
- Morphology, culture characteristics, Pathogenicity, Lab diagnosis of common pathogenic fungi

Immunology:

- Introduction, Antigens (Types and properties) Antibodies / Immuno globin types and properties), Antigen- antibody reactions and their applications (Agglutination, precipitation, complement fixation and neutralization tests)
- Immunity (Innate & Acquired)
- Immunodeficiency diseases

Medical Virology:

- Classification, nomenclature, general characteristics (Morphology , chemical , biological properties and multiplication)
- Cultivation of viruses (cell culture and animals)
- Bacteriophages (lytic and lysogenic cycles)
- Morphology , Cultural characteristics , Pathogenicity

Molecular Biology:

- DNA & RNA
- Isolation of DNA (Genomic & Plasmid)
- Plasmids (types and Importance)
Principles , methods and application of
- ELISA , Immunofluorescence test , Western Blot
- PCR

Haematology :

- Introduction to haematology
- Blood components , collection , anticoagulants , preparation of smears & quality
- Haemoglobin, TLC, DLC with absolute count, WBC, Red cell indices, Reticulocytes (methods of estimation , clinical significant)
- RBC - structure , erythropoietin , functions
- WBC - Physiology , pathological variation

- Platelets - functions, purpuras , investigation of disorders , thrombocytosis , thrombocytopenia
- Staining- Leishman's stain, MGG, Giemsa's, PAS, Sudan B-Black, Iron, Fats, Nap Acid Phosphates, Esterase (Principle, composition, methods & results)

Histopathology-Basic & Technique:

- Cells and tissues - definition, cells and its organelles, function, cell cycle, mitosis meiosis.
- Histology of different systems & Organs-Respiratory system, Alimentary system Excretory systems, Reproductive system (male & female), Endocrine system.

Cytology (Basic, Technique)

- Definition of cytology, material of operation and establishment of cytology laboratory, role of cytology in the diagnosis, branches of cytology.
- Quality controls (internal & external definition, methods, advantage.

Annexure-3

Part B(II)--General Knowledge, Logical Reasoning and Mental Ability, English, Punjabi

Sr. No.	Indicative Contents of Syllabus	Weightage (Approx.)
1	<p>General Knowledge and Current affairs of National and International importance including:</p> <ul style="list-style-type: none"> (i) Political issues, (ii) Environment issues, (iii) Current Affairs, (iv) Science and Technology, (v) Economic issues, (vi) History of Punjab-14th century onwards (vii) History of India with special reference to Indian freedom struggle movement. (viii) Sports, (ix) Cinema and Literature. 	10
2	<p>Logical Reasoning & Mental Ability:</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 & Loss, Partnership and Mixture, Simple and Compound Interest, Work and Time, Time and Distance. Mensuration and Data Interpretation.</p>	10
3	<p>English:-</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>ਪੰਜਾਬੀ:-</p> <p>ਸ਼ੁੱਧ-ਅਸ਼ੁੱਧ, 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।</p>	5
	Maximum Marks	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.