

**ODISHA STAFF SELECTION COMMISSION**

Barrack No.1, Unit – V, Bhubaneswar – 751054

No.IIE-64/2021-1557/OSSC;

Date: 21.03.2022

**Notice**

Pursuant to **Advertisement No.4347/OSSC; dated 24.12.2021**, it is for information of all concerned that the ONLINE APPLICATION FORM for combined recruitment against **67 vacancies in the post of Junior Fisheries Technical Assistants as Initial Appointees under Directorate of Fisheries, Govt. of Odisha** shall be made available in the official website of the Commission "[www.osscc.gov.in](http://www.osscc.gov.in)" as per the following programme:-

	Starting Date	Closing Date
Online Registration	22.03.2022	22.04.2022
Online Payment of Examination Fees	22.03.2022	22.04.2022
Submission of Online Application Form	22.03.2022	30.04.2022
Mode of apply	Online Mode only through the website <a href="http://www.osscc.gov.in">www.osscc.gov.in</a> . No Physical copy/Hard copy of the online application form need to be submitted by the applicant.	

The candidates may go through the Detailed Advertisement available in the "**What's New**" section of the above website and apply for the post through online mode only within the above stipulated dated by clicking on the "**Apply online**" tab available in the Home page.

Further, pursuant to Odisha Civil Service (Fixation of upper age Limit) Amendment Rules, 2022 issued vide Government in GA & PG Department Notification No.771/Gen. dated 11.01.2022, the maximum age as mentioned in **Clause-4(i) under 'Eligibility' head of the Indicative Advertisement No.4347/OSSC dated 24.12.2021** shall be read as **38 years as on 01.01.2021 in place of 32 years** with usual age relaxation for SC, ST, SEBC, PwD, Women, Ex-servicemen & In-service Contractual employees.

Other stipulations of the Indicative advertisement remain unaltered.

By order of the Commission

*[Signature]*  
Secretary 21.03.2022



**ODISHA STAFF SELECTION COMMISSION**

Barrack No.1, Unit – V, Bhubaneswar – 751054

Website-“[ossc.gov.in](http://ossc.gov.in)”

Advt. No.IIE-64/2021/4347/OSSC;

Date: 24.12.2021

Selection of 67 posts for recruitment to the post of Junior Fisheries Technical Assistants as “Initial Appointees” under Directorate of Fisheries, Govt. of Odisha

(Post Code: JFTA/173)

**DETAILED ADVERTISEMENT****IMPORTANT:**

- Online Applications are invited from intending candidates to fill up 67 posts of Junior Fisheries Technical Assistants as “Initial Appointees” under Directorate of Fisheries, Govt. of Odisha.

	Starting Date	Closing Date
Online Registration	22.03.2022	22.04.2022
Online Payment of Examination Fees	22.03.2022	22.04.2022
Submission of Online Application Form	22.03.2022	30.04.2022
Mode of apply	Online Mode only through the website <a href="http://www.ossc.gov.in">www.ossc.gov.in</a> . No Physical copy/Hard copy of the online application form need to be submitted by the applicant.	

- Candidates must register their valid e-Mail Id and Mobile number while applying for the post and keep the same active till completion of this recruitment process to receive important messages from the Commission relating to the recruitment.
- Before applying for the post, the Candidates must go through this detailed advertisement and on satisfying the eligibility criteria prescribed there in, may apply for the post through online mode only. Application(s) received through any other mode shall not be entertained by the Commission.
- The candidate must have possessed +2 Vocational (Fisheries) from CHSE/University. Candidates possessing +2 Science qualifications are also eligible to apply for the post. But when candidates possessing +2 Vocational (Fisheries) qualifications are not available, then only candidates with +2 Science qualifications will be considered for selection. Applicants must know swimming well.
- The appointment will be initially on contractual basis carrying a consolidated remuneration of Rs.13, 100/- per month (for 1<sup>st</sup> year) as per Odisha Group-C & D Posts (Contractual Appointment) Rules, 2013 and amended up to date.
- Candidate must not be below 21 Years and must not exceed 38 years of age as on 1<sup>st</sup> January 2021 to be eligible to apply for the post (refer to Clause-6(a) of this Advertisement) with usual age relaxation for ST/SC/SEBC/Women/ Ex-Servicemen/PwD and In-Service contractual candidates as per relevant rules of Govt. in force.
- In-service contractual candidates appointed before 17.01.2014 in Group-B post/services or before 18.11.2013 in Group-C&D posts/services & claiming benefits under the Contractual Appointment Rules shall have to follow the advisory notice published vide No.3568/ dtd.01.11.2019 available in the Commission's website.



- The Commission may conduct the Preliminary examination and the Main Written examination with objective papers through CBRE (Computer Based Recruitment Examination) Mode. In case of CBRE mode examination is conducted in more than one session, Commission will adopt normalization process as per the advisory Notice No.2444/OSSC dated 02.09.2021(available in the website of the Commission i.e. [www.osscc.gov.in](http://www.osscc.gov.in)) for processing the result so as to offset the difficulty level that may arise in such use of multiple set of question papers in the said examination.
- The candidate must submit correct data /information in the Online Application Form basing on which he/she shall be allowed to appear the examination. If at any stage of recruitment or thereafter, it is found that any information furnished by the candidate in his/her online application is false/incorrect or the candidate has suppressed any relevant information or the candidate otherwise does not satisfy the eligibility criteria prescribed for the post, his/her candidature for the post will be cancelled forthwith.

## 2. How to apply:

- The applicants have to go through the Detail Advertisement before filling up the online application form.
- Aspirants have to apply online using the official website of the Commission [www.osscc.gov.in](http://www.osscc.gov.in).
- All eligible candidates have to register themselves by clicking on “**APPLY ONLINE**” button in the Home page of the Commission’s website [www.osscc.gov.in](http://www.osscc.gov.in).
- Those candidates who are applying for the first time have to register for the post by clicking on “**NEW USER**” button shown on the screen. On submitting the registration form a User Id and Password will be generated.
- On clicking “New user” or “Registered User” instruction for filling up the Online Registration/ Re-registration and filling up the online Application Forms shall appear on the computer screen. These instructions are to be read carefully before proceeding for filling up the online Application Form.
- Step by step procedure for registration/re-registration can be viewed by clicking on “**Instruction to fill up Online Application Form**”.

## 3. Pre-requisites for filling up online Application Form

- Applicants should possess and maintain an e-Mail Id and Mobile Number for accessing the OSSC web portal and to make Online Registration/Re-Registration and to fill up the online Application Form. **Candidates should keep that e-mail Id and Mobile Number (given during registration) active to receive all important communication relating to this recruitment till publication of the final result.**
- Recent Passport size Colour Photograph of the Applicant, scanned in “jpg/jpeg” format between ranges of 20 kb to 100kb shall be kept handy for uploading during Registration for any post.
- Full Specimen Signature & Left /Right Thumb Impression of the Applicant, scanned in “jpg/jpeg” format between ranges of 20 kb to 50kb shall be kept handy for uploading during Registration.





- d. Applicant shall keep their Certificates, Mark sheets & other documents ready as per Clause-9 of the advertisement while filling in the details of the educational qualification & other claims during filing of Online Application Form.
- e. Applicants should enter the Aadhar number in the appropriate field in the online application form.
- f. SC/ST/SEBC category candidates need to submit detail information of online Caste Certificate issued by competent Authority in the online application form. But if the valid online Caste Certificate issued by the competent Authority is not in possession with the candidate at the time of submission of the online application form, he/she must give self declaration in the format appended to the online application form.
- g. Candidate claiming reservation/age relaxation under "**Ex-Serviceman**" category need to upload any one of the Ex-Servicemen Documents i.e. **Discharge Certificate/ Identity card/ PPO (wherein the date of entry, date of discharge and period of service rendered in Defence Forces have been reflected)**. Ex-Servicemen who are going to retire within six months from the closing date of online application may apply for the post by obtaining relevant "No Objection Certificate" from the appropriate authority mentioning therein the date of appointment, date of retirement and years of service rendered in Defence Forces. However such candidates have to submit the discharge certificate on the date of certificate verification on the date of certificate verification for considering their claims under Ex-Serviceman category. The scanned document must be in "Pdf" format between ranges of 100kb to 500 kb.
- h. Candidates claiming reservation/ age relaxation under "**PwD (Persons with Disabilities)**" category need to upload a valid online **PwD** certificate issued by **Unique Disability Identification (UDID)**. The scanned document must be in "Pdf" format between ranges of 100kb to 500 kb.
- i. **In-service contractual employees of Government Offices** claiming age relaxation (maximum age limit 45 years as on 01.01.2021) as per Govt. in G.A. Department Notification No.GAD-SC-Rules-0061-2013-1147/Gen dtd.17.01.2014 (for the candidates in Group-B Post& Services) & Notification No.GADSC-Rules-0009-2013/32010/Gen dtd.18.11.2013 (for Group-C & D Post & services) and who have completed minimum one year of continuous service prior to commencement of the above Rules must possess the required certificate issued by the concerned employer in the proforma prescribed by the Commission vide Advisory Notice No.3568/OSSC dated 01.11.2019 available in the website of the Commission [www.osscc.gov.in](http://www.osscc.gov.in). They shall have to fill the detail information like Name of the Employer, Scheme of appointment, date of appointment, whether covered under Category-I/Category-II (as per clause-8 of Odisha Group-B/Group-C & D Contractual Appointment Rules-2013), FD Approval/Concurrence No. in the online application form and candidate has to produce the relating originals documents during Certificate Verification for consideration of their claim under Contractual in-service benefits.

**The candidate should ensure that the scanned Photograph and full Signature, Left/Right Hand Thumb Impression and other relevant documents must be clearly identifiable/ visible, otherwise the registration and application shall be liable for rejection and no correspondence on this account shall be entertained.**



Candidates must submit correct data /information in the Online Application Form basing on which the candidate shall be allowed to appear the examination. If at any stage of recruitment or thereafter, it is found that any information furnished by the candidate in his/her online application is false/incorrect or the candidate has suppressed any relevant information or the candidate otherwise does not satisfy the eligibility criteria prescribed for the post, his/her candidature for the post will be cancelled forthwith.

**4. Vacancy position:-**

**(a) Number of posts for Junior Fisheries Technical Assistants & reservation thereof:-**

As per requisition received from Directorate of Fisheries, Odisha, Cuttack, the category-wise break-up of the total no. of vacancies and posts reserved for women in each category including special category vacancies to be filled up through this recruitment is as follows:-

UR (Out of which women)	SEBC (Out of which women)	SC (Out of which women)	ST (Out of which women)	Total (Out of which women)	PwD With Benchmark disability to be reserved	Ex-Servicemen (ESM)	Sports Person (SP)
14 (W-04)	13 (W-04)	11 (W-04)	29 (W-10)	67 (w-22)	LV/Partially Blind-01 HI(with suitable aid)-01 <u>LD(OL,OA,BL)-01</u> Total-03	02	01

**PWD Reservation:** The PwD candidates in the following categories with type of disabilities mentioned against each are eligible to apply for the post. The type of disabilities of PwD as mentioned eligible to get reservation is detailed below:-

Category	Benchmark Disability
I	LV ( Low Vision)
II	Partially Deaf – With suitable Aid)
III	Loco Motor Disability with OL (One Leg) affected or OA (One Arm) affected, BL(Both Legs) affected (Mobility not restricted)

**Physical Requirement:-**

Code	Function
H	Work performed by hearing/speaking
SE	Work performed by seeing
ST	Work performed by standing
S	Work performed by sitting (on bench or chair)
W	Work performed by walking

**Note:** The number of vacancies and other conditions of vacant posts to be filled up on the basis of this recruitment are subject to change without any prior notice as per discretion of the Commission /the Requisitioning Authorities/the Government.



#### **4. (b) Provision of assistance of Scribe**

PwD candidates who have not less than 40% permanent disability and have limitation in writing shall have the option to use his/her own scribe with due permission of the Commission. The intending candidates have to give option for scribe in the online application form. They have to submit the required information in the prescribed format as per Appendix-I and Appendix-II of the Advisory Notice No.3453/OSSC Dtd.24.10.2019 (available in the Commission's website) when asked to do so by the Commission.

#### **5. Remuneration of the post and Condition of service:**

The appointment to the post will be initially on contractual basis carrying remuneration of Rs.13, 100/- per month (for 1<sup>st</sup> year) as per Govt. In GA & PG Department Notification No.28621/Gen. Dated 27.10.2021 and conditions of service shall be guided as per Odisha Group-C & Group-D posts (Contractual Appointment) Rules, 2013 amended update as well as Odisha Sub-Ordinate Fisheries Service (Recruitment & Conditions of Services) Rules, 2013.

#### **6. Eligibility:**

##### **(a) Age:**

(i) The minimum age for the post is 21 years and the maximum age is 38 years as on 01-01-2021. The upper age limit is relaxable by 5 years for candidates belonging to SEBC, SC, ST & all Women candidates, 10 years for candidates belonging to PwD category & the total period of service rendered in Defence Service in case of Ex-servicemen. PwD candidates in the ST & SC category shall be entitled to **cumulative age relaxation** of ten years over & above the normal relaxation specified for the category. However, a candidate can only avail one type of age relaxation most beneficial to him/her as per rule. To be eligible, candidates not enjoying any relaxation of upper age limit must not have been born earlier than 2<sup>nd</sup> January, 1983 and not later than 1<sup>st</sup> January 2000. The persons in Defence Forces not having more than six months to retire/ discharge from the forces as on the last date of the submission of online application are eligible to apply as ex-serviceman for the post. However such candidates have to submit the discharge certificate on the date of certificate verification for considering their claims under Ex-Serviceman category.

**Border Security Force, Indian Coast Guard, CRPF and other Para Military Forces are not within the definition of Ex-Servicemen.**

**Note:** Once an Ex-Serviceman has joined the Govt. Service in civil side after availing the benefit as an Ex-Serviceman for his re-employment, his ex-serviceman status for the purpose of re-employment in Govt. Jobs shall cease to exist. He can avail age relaxation only. However as per clause-4 of the O.M. No. 36034/2014-Estt.(Res) dt.14 August,2014 of Ministry of Personnel, Public Grievances and Pensions, Department of Personnel & Training, Government of India, if an Ex-Serviceman applies for various posts before joining any civil employment, he/she can avail of the benefit of reservation as ex-serviceman for any subsequent employment, provided the applicant as soon as joins any civil employment, should give self-declaration/undertaking to the concerned employer about the date-wise details of application for various posts for which he/she had applied for before joining. The applicant should furnish the copy of above declaration duly endorsed by the employer on the date of Document Verification for consideration of the claim of reservation under Ex-Serviceman category.



However, the upper age limit is relaxable for in-service contractual employees engaged by the Govt. or through manpower service provider agencies in the State Govt. offices or the State Govt. of Odisha who have completed at least one year of continuous service prior to commencement of the said rules as per provision of "Odisha Group-C & D posts (Contractual appointment) Rules, 2013" shall get age relaxation. As such they must be less than 45 years as on 01.01.2021. They should submit the required proof from their employer (as furnished in detail in Clause-9) for availing the age relaxation at the time of certificate verification.

**6(b)** Date of birth entered in the High School certificate Examination by the Board of Secondary Education, Odisha or equivalent Certificate issued by the recognised Board/Council/ by an Indian University as equivalent there to shall only be acceptable to the Commission.

**7. (a) Educational Qualification:-**

The candidate must have possessed +2 Vocational (Fisheries) from CHSE/University and must know swimming well. Candidates possessing +2 Science qualifications will also be eligible to apply for the post. But when candidates possessing +2 Vocational (Fisheries) qualifications will not be available, candidates with +2 Science qualifications will be considered for selection.

**7 (b).** The candidates must know swimming well. He/She has to declare to this effect in the online application form.

**7(c) General Eligibility Criteria**

In order to be eligible for appearing in the examination a candidate must satisfy the following conditions.

- (i) The candidate must be a citizen of India.
- (ii) Be able to speak, read & write Odia.
- (iii) Be of good moral character & conduct.
- (iv) Be of good mental condition and bodily health and free from any physical defect likely to interfere with the discharge of his duties in the service. A candidate, who after such medical examination as the Government may prescribe is not found to satisfy these requirements shall not be appointed to the service.
- (v) If married, must not have more than one spouse living. Provided that Government may, if satisfied that such marriage is permissible under Personal Law applicable to such person or there are other grounds for doing so, exempt any person from the operation of this rule.
- (vi) Candidate must have passed Middle School Examination with Odia as a language subject, or have passed High School Certificate Examination or equivalent examination with Odia as a subject/medium of examination in non-Language subject, or have passed in Odia as a language subject in the final examination of Class VII or above or have passed a test in Odia in M.E. School Standard conducted by the School & Mass Education Department.

**NB: Not fulfilling of any of the eligibility criteria shall render the applicant's candidature invalid & rejected.**



### **8. Examination Fee:**

The candidates other than SC/ST/PwD (having Permanent Disability) category have to pay a non-refundable examination fee of Rs. 200/-. The fees can be deposited only through online mode using Internet Banking/Debit Card/Credit card/other available payment methods linked with the online application form. Candidates are advised to keep with them the copy of the e-receipt as a token successful payment of required examination fee for future reference.

Applications without payment of examination fees (except SC/ST/PwD (having Permanent Disability) candidates will be taken as incomplete and shall be liable for rejection.

### **9. Certificates / documents to be submitted at the time of Certificate verification:-**

The certificates/documents as listed below have to be submitted in original along with a set of self-attested xerox copies of the same and duly ink signed the copy of the Online Application Form during certificate verification.

- Copy of the Online Application Form.
- HSC or equivalent pass certificate & mark sheet.
- +2 vocational (Fisheries) or +2 (Science) pass certificate and mark sheets.
- Recent valid caste certificate issued through online mode by competent authority to get reservation/ age relaxation under SEBC/SC/ST category.
- Certificate of passing HSC examination with Odia as a compulsory subject, or in lieu thereof a certificate of passing a language test in Odia in final examination of Class-VII issued by Principal/Head Master or any Educational Institution duly recognised by Govt. of Odisha/ Central Govt. or other competent authority.
- Certificate of disability issued online by Competent Authority along with UDID (Unique Disability Identification Card) in case of PwD candidates with 40% or above permanent disability claiming reservation for the post.
- Candidates claiming age relaxation under Ex-servicemen (ESM) category must submit Discharge certificate, identity Card & P.P.O issued by the appropriate Authority where in the Date of Entry, Date of Discharge & Period of Service rendered in Defence forces etc are mentioned. The persons in Defence Forces having more than six months to retire/ discharge from the forces as on the date of the submission of online application are not eligible to apply as ex-serviceman for the post. Ex-Servicemen who are going to retire within six months from the last date of submission of online application may apply for the post by obtaining relevant **"No Objection Certificate"** from the appropriate authority mentioning therein the date of appointment, date of retirement and years of service rendered in Defence Forces. However, such candidates have to submit the discharge certificate on the date of certificate verification for considering their claims under Ex-Serviceman category. ESM candidates also have to furnish declaration in the prescribed format to the effect that they have not taken the benefits of ESM earlier in civil post.





- In-Service contractual employees claiming age relaxation and contractual In-service benefits must submit a Certificate from employer as per proforma prescribed by the Commission vide the **Advisory Notice No.3568/OSSC dated 01.11.2019** available in the website of the Commission. Further the candidates shall have to furnish the detail information/documents like Name of the Employer, Scheme of appointment, date of appointment, whether covered under Category-I/Category-II (as per clause-8 of Odisha Group-B/Group-C & D Contractual Appointment Rules-2013), FD Approval/Concurrence No. as filled in the online application form for Verification.

**10 (a). Plan, pattern & syllabus of Examination:**

The recruitment to this post will comprise of two stages

1. Written Examination
2. Certificate Verification

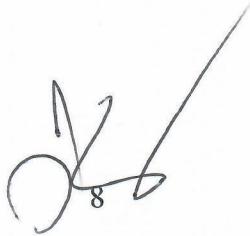
1. Written Examination	Subject & Mark distribution	Duration of Examination	Remarks
Objective Type test with Multiple Choice Based Questions from the Subject +2 Vocational Fisheries and +2 Science (Chemistry & Biology)	+2 Vocational Fisheries- (50 questions)-50marks +2 Chemistry- (20 questions)-20 marks +2 Biology- (30 questions)-30 marks <b>Total</b> (100 questions)-100 marks	1 & ½ hours (90 minutes)	1. The written examination will be conducted through Computer Based Examination (CBRE).  2. There shall be negative marking @ 0.25 marks for each wrong answer.
2. Certificate verification	Candidates numbering about 2(two) times of the vacancies, in order of merit, category wise from +2 Vocational Fisheries will be shortlisted for certificate verification basing on their performance in the written examination.  <b>However, if required number of candidates in +2 vocational Fisheries are not available then candidates from +2 Science shall be shortlisted for certificate verification.</b> Certificate verification will be done to determine their eligibility for the post with reference to their Original certificates/documents. The candidature of the candidates will be rejected who will remain absent in certificate verification.		

There shall be no career marking and no viva-voce test as per Govt. in G.A. & P.G. Department Notification No. 5898 dtd22.02.2021 & Notification No. 19114 dtd.21.08.2020 respectively.

**10(b). Detail Syllabus of written Examination:-**

Syllabus of +2 Vocational Fisheries and +2 Science (Chemistry & Biology) are appended as **Annexure-I, Annexure-II and Annexure-III to this advertisement.**

**Note:** It is binding on the candidate to appear every stage of examination. The candidature of the candidate shall be rejected if he/she fails to appear in any of the stages of recruitment examination.





### **11. Place, Date, Venue of Written Examination:**

The Date, Time, Venue of the Computer Based Recruitment Examination (CBRE) & certificate verification will be informed to the candidates in the Admission Letter, which will be made available in the website of the Commission. The Admission Letter will be carrying the photograph and signature of the candidate and facsimile signature of Secretary of the Commission. The Admission Letter will also contain instructions to the candidates which should be followed strictly by the candidates. Any deviation made by the candidate during the examination will forfeit his/her candidature for the post. The Admission Letters will be made available in the official website of the Commission prior to the holding of the CBRE & certificate verification. Alert message will be sent to the candidates through their registered Mobile Number/ e-mail Id. while the Admission Letters is made available in the Commission's website. Candidates are therefore advised to keep their e-Mail Id and Mobile number active till completion of the recruitment process. Each candidate shall have to download his/her Admission Letters well before the date of the examination. The candidates are also advised to regularly visit the website of the Commission to know the status of each examination/tests etc. No Admission letter will be sent through post.

### **12. SELECT LIST:**

- Two separate merit lists one for +2 vocational Fisheries and another for +2 Science will be prepared after certificate verification basing on the mark secured in the Written Examination from among the candidates who are found suitable and eligible in all respect for the post as per the terms of the advertisement. In the select list, candidates having +2 Vocational (Fisheries) as qualification will be considered first and only after its exhaustion candidates from the second merit list having +2 Science as their qualification will be considered.
- The select list shall be prepared by the Commission in order of merit category wise basing on the mark secured in the Written Examination equal to the number of vacancies notified in the advertisement and the select list will be submitted to the Director, Fisheries, Odisha. The Director shall finalize the select list on recommendation of the Commission with approval of Government. The final select list shall be published by the Commission.

### **Note:**

- The candidates are required to visit the official website of the Commission '[www.osscc.gov.in](http://www.osscc.gov.in)' regularly for detailed information about the programme of the examination other important notices etc. and also keep track of publication of various notices of this recruitment to be published in the leading local daily newspapers.
- The candidate should furnish correct Mobile Number and e-Mail Id for sending SMS and other relevant information relating to this recruitment. The Mobile No. & e-Mail Id should remain active till completion of the recruitment process to avoid any communication gap.



**WARNING**

Mobile phone or any other electronics devices are strictly prohibited in the premises of the examination centre. The candidates are advised not to bring any such banned items to the examination centre. Any infringement of these instructions might entail debarment of the concerned candidate from the examination.

By order of the Commission

  
Secretary

\*\*\*



**INLAND FISHERIES (IF)****Introduction to Inland Fisheries****Unit-I**

Introduction to fisheries; importance of fish, present status (global, India and Odisha context). Types of fisheries: freshwater, brackish water, estuaries, riverine, reservoirs, lakes, etc.

**Unit-II**

Inland fisheries resources, Freshwater resources, Riverine resources, reservoirs, lakes, bheels, wetlands, ponds, tanks and canals. Brackish water resources, lakes, lagoons, estuaries, mudflats, backwaters. Inland fishery resources of Odisha.

**Unit-III**

Species contributing to inland fisheries: A general account of economically important freshwater and brackish water fin and shell fishes and their distinguishing characters for identification, food and feeding habits, growth, reproduction and migration.

**Unit-IV**

Fisheries of reservoirs and lakes, conservation of fish stocks, stocking with fish culture and capture management. Floodplain wetlands as capture fishery resources, present status of their exploitation and management. Fisheries resources of Chilika lake and Ansupa.

**Unit-V**

Coldwater fisheries status, important species, cold water fishery resource management. Fish catching devices, common inland fishery crafts and gears their usefulness, operation, restriction of use, fish aggregating devices.



## **INTRODUCTION TO AQUACULTURE**

### **Unit-I**

History of aquaculture, present global and national scenario, principles of aquaculture, importance of aquaculture, culture practices, conventional monoculture, composite fish culture, mixed culture, integrated aquaculture, criteria for selection of candidate species for aquaculture, sewage fed fisheries, waste water aquaculture. Method of culture: traditional/extensive, semi-intensive, intensive aquaculture in inland water bodies.

### **Unit-II**

Types of fish farms: freshwater/brackish water, type of ponds- nursery, rearing, grow-out. Layout design and construction of fish farm. Soil types, properties, classification, sampling methods and texture analysis, effects of seepage and their control, location, design and construction of hatcheries, design and construction of cage and pens for fish culture.

### **Unit-III**

Freshwater aquaculture resources- ponds, tanks, lakes and reservoirs. ursery, rearing and grow out pond preparation and management, control of aquatic weeds, predatory and weed fishes, algal blooms, liming, fertilization/manuring, use of bio-fertilizers, stocking, feeding to fishes, pond environment management, fish health management, harvesting.

### **Unit-IV**

Freshwater prawn culture and important species for culture, seed stocking and culture practices, brackish water aquaculture, important finfishes and shellfishes for



1109

culture, collection of seed, stocking, important species for culture, seed stocking, culture practices.

#### **Unit- V**

Ornamental fish culture, important indigenous and exotic ornamental fishes, preparation of indoor system for culture and their rearing management. Catfish and air breathing fish culture. Important species for culture, seed stocking and culture practices. Integrated aquaculture principle, fish cum poultry, fish-cum-duck culture and fish cum cattle rearing.



# ANNEXURE - II

## CHEMISTRY

### Unit I: Some Basic Concepts of Chemistry

Atomic and molecular masses and equivalent mass of elements, acid, base, and salt, oxidants, reductants, and mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry, expression of concentration of solutions.

### Unit II: Structure of Atom

Atomic number, isotopes, isobars, Rutherford's model and its limitations, Bohr's model and its limitations, concept of shells and subshells, dual nature of matter and light, de Broglie's relationship, Heisenberg uncertainty principle, concept of orbitals, quantum numbers, shapes of s, p and d orbitals, rules for filling electrons in orbitals – Aufbau principle, Pauli's exclusion principle and Hund's rule, electronic configuration of atoms, stability of half filled and fully filled orbitals.

### Unit III: Classification of Elements and Periodicity in Properties

Modern periodic law and the present form of periodic table, periodic trends in properties of elements - atomic radii, ionic radii, inert gas radii, ionization enthalpy, electron gain enthalpy, electronegativity, valency and oxidation state. Nomenclature of elements with atomic number greater than 100.

### Unit IV: Chemical Bonding and Molecular Structure

Valence electrons, ionic bond, covalent bond; bond parameters, Lewis structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridization, involving s, p and d orbitals and shapes of some molecules, molecular orbital theory of homonuclear diatomic molecules (qualitative idea only), hydrogen bond.

### Unit V: States of Matter: Gases and Liquids

Role of gas laws in elucidating the concept of the molecule, Boyle's law, Charles law, Gay Lussac's law, Avogadro's law, ideal behaviour, empirical derivation of gas equation, Avogadro's number, ideal gas equation. Deviation from ideal behaviour, liquefaction of gases, critical temperature, kinetic energy and molecular speeds (elementary idea).

### Unit VI: Chemical Thermodynamics

Concepts of System and surroundings and types of system, surroundings, work, heat, energy, extensive and intensive properties, state functions.

First law of thermodynamics - Internal energy and enthalpy. Hess's law of constant heat summation, enthalpy of bond dissociation, combustion, formation, neutralization, atomization, sublimation, phase transition, ionization, solution and dilution, Second law of



107  
172

Thermodynamics (brief introduction). Introduction of entropy as a state function, Gibb's energy change for spontaneous and non-spontaneous processes, criteria for equilibrium. Third law of thermodynamics (Statement only).

#### **Unit VII : Equilibrium**

Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass action, equilibrium constant ( $K_c$ ,  $K_p$  and  $K_x$  and their relationship), factors affecting equilibrium, Le- Chatelier's principle, ionic equilibrium, ionization of acids and bases, strong and weak electrolytes, degree of ionization, concept of  $P_H$ , hydrolysis of salts (elementary idea), buffer solution, Henderson Equation, solubility, product, common ion effect (with illustrative examples) numerical problems.

#### **Unit VIII : Redox Reaction**

Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions, in terms of loss and gain of electrons and change in oxidation number.

#### **Unit IX : Hydrogen**

Position of hydrogen in periodic table, occurrence, isotopes, preparation, properties and uses of hydrogen, hydrides-ionic, covalent and interstitial; physical and chemical properties of water, heavy water and use of hydrogen as a fuel.

#### **Unit X : s-Block Elements (Alkali and Alkaline Earth Metals)**

##### **Group 1 and Group 2 Elements**

General introduction, electronic configuration, occurrence, anomalous, properties of the first element of each group, diagonal relationship, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen and halogens, uses.

##### **Unit XI : Some p- Block Elements**

##### **General Introduction to p- Block Elements**

**Group 13 Elements :** General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous properties of first element of the group, Boron - physical and chemical properties.

**Group 14 Elements :** General introduction, electronic configuration, occurrence, variation of properties, oxidation states, trends in chemical reactivity, anomalous behaviour of first elements. Carbon-catenation, allotropic forms, physical and chemical properties; uses of some important compounds: oxides. Important compounds of Silicon, Silicones, Zeolites and their uses.

##### **Unit XII : Organic Chemistry - Some Basic Principles and Technique**

General introduction, classification and IUPAC nomenclature of organic compounds. Electronic displacements in a covalent bond, inductive effect, electromeric effect, resonance and hyperconjugation. Homolytic and heterolytic fission of a covalent bond free radicals, carbocations, carbanions, electrophiles and nucleophiles, types of organic reactions.

##### **Unit XIII : Hydrocarbons**

Classification of Hydrocarbons

Aliphatic Hydrocarbons :

Alkanes - Nomenclature, isomerism, conformation (ethane only), methods of preparation from unsaturated hydrocarbons, alkyl halides, carboxylic acids (Decarboxylation and Kolbes electrolytic method), physical properties, chemical reactions: including free radical mechanism of halogenation, combustion, controlled oxidation, isomerisation, aromatisation, with steam and pyrolysis.

Alkenes - Nomenclature, structure of double bond (ethene), geometrical isomerism, methods of preparation from alkynes, alkyl halides, vicinal dihalides, alcohols, physical properties, chemical reactions: addition of hydrogen, halogen, water, hydrogen halides, sulphuric acid (Markownikoff's addition and peroxide effect), ozonolysis, oxidation, polymerisation and mechanism of electrophilic addition reaction.

Alkynes - Nomenclature, structure of triple bond (ethyne), methods of preparation, from calcium carbide, vicinal dihalides, physical properties, chemical reactions : acidic character of alkynes, addition of hydrogen, halogens, hydrogen halides, water, and polymerisation.

Aromatic Hydrocarbons : Introduction, IUPAC nomenclature, benzene : resonance, aromaticity, preparation of benzene from acetylene, phenol and aromatic acids, chemical properties: mechanism of electrophilic substitution, nitration, sulphonation, halogenation, Friedel Craft's alkylation and acylation, addition of hydrogen, addition of chlorine, combustion.



ANNEXURE - III

**Biology**

Unit I : Diversity in living world

Unit II: Structural organization in animals and plants

Unit III: Cell structure and function

Unit IV: Plant physiology

Unit V: Human physiology

**Biology**

**2nd year Science(Theory)**

Unit I: Reproduction

Unit II: Genetics and Evolution

Unit III: Biology and Human Welfare

Unit IV: Biotechnology and its applications

Unit V: Ecology and Environment