1.3 Curriculum Enrichment

Session-2022-2023

Supporting Documents

Metric No.	Sr. No.	Content / File Description	Document Link
1.3.2.	B	Courses Featuring Experiential Learning: Project Work, Field Work, Internship	

Principal
Arts & Commerce College,
Warvat Bakal Dist.Buldana

SATPUDA EDUCATION SOCIETY, JALGAON JAMOD'S

Arts & Commerce College

Warwat Bakal Tq. Sangrampur Dist - Buldhana (M.S.)

NAAC Reaccredited with 'B' Grade

College Code : 327

- Principal -
Dr. Shriram Yerankar
M.A., M.Phil, Ph.D.
9423722316

- President -
Shri. Krushnarao Ingle
(Ex. M.L.A.)
07266-221449

Website : www.acscwb.co.in

E-mail : 327accwb@gmail.com

CERTIFICATE

This is to certify that the documents attached as supporting documents for Criterion I: Curricular Aspects are verified from the college record and found to be correct to the best of my knowledge.

Principal
Arts & Commerce College,
Warvat Bakal Dist.Buldana

Department of Chemistry

Number of Students under Taking Project Work

Session: 2022-2023

Class: B.Sc.

Subject: Chemistry

Years	Semester	Winter/ Summer	No. of students who completed Project
2022-2023	Sem III	Winter – 2022	71
	Sem V	Winter -2022	80
	Sem IV	Summer - 2023	71
	Sem VI	Summer - 2023	80

Arts & Commerce College ★ Warvat Bakal ★

Principal
Arts & Commerce College,
Warvat Bakal Dist.Buldana

Department of Botany

Number of Students under Taking Project Work

Session: 2022-2023

Class: B.Sc.

Subject: Botany

Years	Semester	Winter/ Summer	No. of students who completed Project
2022-2023	Sem VI	Summer – 2023	65

Arts & Commerce College ★ Warvat Bakal ★

Principal
Arts & Commerce College,
Warvat Bakal Dist.Buldana

Department of Zoology

Number of Students under Taking Project Work

Session: 2022-2023

Class: B.Sc.

Subject: Zoology

Years	Semester	Winter/ Summer	No. of students who completed Project
2022-2023	Sem I	Winter – 2022	103
	Sem III	Winter – 2022	48
	Sem V	Winter – 2022	65
	Sem II	Summer – 2023	103
	Sem IV	Summer – 2023	49
	Sem VI	Summer – 2023	65

Commerce College ★ Warvat Bakal ★ Arts &

Principal
Arts & Commerce College,
Warvat Bakal Dist.Buldana

Department of Commerce

Number of Students under Taking Project Work

Session: 2022-2023

Class: B.Com. III Semester (V&VI)

Subject: E-Commerce

Years	Admission	Winter/ Summer	No. of students who completed Project
2022-2023	94	Winter – 2022	94
		Summer -2023	94

Arts & Commerce College * Warvat Bakal *

Principal
Arts & Commerce College,
Warvat Bakal Dist.Buldana

Syllabus of the courses that include experiential learning through project work

Environmental Studies (B.A, B.com, B.sc. II)

%SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI
ORDINANCE NO. 42 OF 2005

Examination in Environmental Studies leading to Bachelor Degree, Ordinance, 2005

Whereas it is expedient to frame an Ordinance relating to Examination in Environmental Studies leading to Bachelor Degree level, hereinafter appearing, the Management Council is hereby pleased to make the following Ordinance.

1. This Ordinance may be called "Examination in Environmental Studies leading to Bachelor Degree, Ordinance, 2005."

2. This Ordinance shall come into force from the Academic session 2005-06.

3. In this Ordinance and in other ordinances relating to the examination, unless there is anything repugnant in the subject or context :-

   (i) "Academic session" means a session commencing on such date and ending with such date of the year following as may be appointed by the Management Council.

   (ii) "Admission to an examination" means the issuance of an admission card to a candidate in token of his having complied with all the conditions laid down in the relevant ordinance, by a competent officer of the University.

   (iii) "Applicant" means a person who has submitted an application to the University in the form prescribed for admission to an examination.

   (iv) "Candidate" means a person who has been admitted to an examination by the University.

   (v) "Regular Candidate" means an applicant who has applied for admission to a University examination through an affiliated college, Department or Institute in which he/she has prosecuting a regular course of study.

   (vi) "Examinee" means a person who present himself/herself for an examination to which he/she has been admitted.

   (vii) "Examination" means an examination prescribed by the University under the relevant Ordinance.

   (viii) "External Candidate" means a candidate who is allowed to take a University examination in accordance with the provision of Original Ordinance No. 151.

   (ix) "Non-Collegiate Candidate" means a candidate who is not a collegiate candidate.

% Amended by Ordinance No. 7 of 2006, and 10 of 2007.

   (x) An "Ex-student" is a person who having once been admitted to an examination of this University, is again required to take the same examination by reason of his failure or absence thereat and shall include a student who may have joined a college, Department or Institute again in the same class.

   (xi) "Bachelor Degree Examination" means a examination leading to Bachelor Degree of the University.

   (xii) "Previous Year" means a year following by final year of Bachelor Degree.

4. Save as otherwise specifically provided, the conditions prescribed for admission to the examination under this Ordinance shall apply to all persons who wish to take the examination to the Degrees of the University mentioned in para 5 below.

5. The conditions prescribed for admission to examination under this Ordinance shall apply to following degrees of the University :-

   1) Bachelor of Arts
   2) Bachelor of Performing Arts
   3) Bachelor of Fine Arts
   4) Bachelor of Mass Communication
   5) Bachelor of Social Work
   6) Bachelor of Commerce
   7) Bachelor of Business Administration
   8) Bachelor of Science
   9) Bachelor of Computer Science
   10) Bachelor of Computer Applications
   11) Bachelor of Pharmacy
   12) Bachelor of Science (Home Science)
   13) Bachelor of Technology (Cosmetics)
   14) Bachelor of Engineering
   15) Bachelor of Engineering (Part Time) (Civil)
   16) Bachelor of Textile
   17) Bachelor of Technology (Chemical Technology)
   18) Bachelor of Technology (Chemical Engg.)
   19) Bachelor of Architecture, and
   20) Bachelor of Laws (Five Year Course)

6 i) Environmental Studies shall be a compulsory subject for a previous year examination of the following Bachelor Degrees of the University,

1) Bachelor of Arts

2) Bachelor of Performing Arts

3) Bachelor of Fine Arts

4) Bachelor of Mass Communication

5) Bachelor of Social Work

6) Bachelor of Commerce

7) Bachelor of Business Administration

8) Bachelor of Science

9) Bachelor of Computer Science

10) Bachelor of Computer Applications

11) Bachelor of Pharmacy

12) Bachelor of Science (Home Science)

13) Bachelor of Technology (Cosmetics)

14) Bachelor of Engineering (Part Time) (Civil)

ii) Environmental Studies shall be a compulsory subject for IIIrd & IVth Semester of the following Bachelor Degrees of the University,

1) Bachelor of Engineering

2) Bachelor of Textile

3) Bachelor of Technology (Chemical Technology)

4) Bachelor of Technology (Chemical Engineering)

5) Bachelor of Architecture, and

iii) Environmental Studies shall be a compulsory subject for Vth & VIth Semester of the Degree of Bachelor of Laws (Five Year Course)

iv) Students admitted to Second Year/Third Year/IVth Semester/Vth Semester of various degree examination courses in different faculties a the academic session 2005-06 or thereafter shall have to appear for examination in the subject Environmental studies.

7. The main Examination leading to Environmental Studies shall be held in Summer and Supplementary examination in Winter every year, at such places and on such date as may be appointed by the Board of Examinations.

Explanation :- Examination shall be conducted on the basis of one common question paper for all Bachelor Degree examination courses irrespective of annual or semester pattern.

8. Scope of the subject for annual pattern examination and or semester pattern examination shall be as provided under the syllabus.

9. Common question paper for all courses covered under this Ordinance alongwith answer books shall be supplied by the University to the Colleges, Departments and Institutes for conducting the examination of the subject.

10. Valuation of the answer books relating to this subject shall be done at College/Department/Institution level only. Remuneration for valuation of answer books shall not be paid by the University.
Provided that prescribed evaluation fee for evaluation of each answer Book/s of an external examinee's appeared from the examination centre shall be paid to each examination centre.

11. It shall be obligatory on the part of the College/Department/Institute to submit candidate wise following information to the University on or before the date as may be prescribed by the University :-

Sr.No.	Grade/Category	Marks secured
1.	"A"	- 60 and above
2.	"B"	- 45 to 59
3.	"C"	- 35 to 44
4.	"D"	- 25 to 34
5.	"Fail"	- 24 and below
6.	"Absent"	

12. For the purposes of teaching, leaning and examination, the Committee consisting of three teachers shall be appointed by the Principal/ Head of the Department/Head of the Institution under his/her Chairmanship/ Chairpersonship. While appointing three teachers on the said committee, the Principal shall take care that the teachers to be appointed on the committee, if necessary, shall be from different faculty.

13. i) Duration of theory examination of this subject shall be three hour.

ii) For all Bachelor Degree examinations, common question paper of 100 marks shall be provided by the University.

iii) Distribution of these 100 marks shall be as follows :-

a) Part-A, Short Answer Pattern	-	25 Marks
b) Part-B, Essay type with inbuilt choice	-	50 Marks
c) Part-C, Essay on Field Work	-	25 Marks

27. ENVIRONMENTAL STUDIES

Total Marks : 100

PART-A

SHORT ANSWER PATTERN — 25 Marks

1. **The Multidisciplinary nature of environmental studies**
   - Definition, scope and importance.
   - Need for public awareness.

(2 lecture hours)

2. **Social Issues and the Environment**
   - From Unsustainable to Sustainable development
   - Urban problems related to energy
   - Water conservation, rain water harvesting, watershed management
   - Resettlement and rehabilitation of people: its problems and concerns. Case studies.
   - Environmental ethics : Issues and possible solutions.
   - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies.
   - Wasteland reclamation.
   - Consumerism and waste products.
   - Environment Protection Act.
   - Air (Prevention and Control of Pollution) Act.
   - Water (Prevention and Control of Pollution) Act.
   - Wildlife Protection Act.
   - Forest Conservation Act.
   - Issues involved in enforcement of environmental legislation.
   - Public awareness.

(7 lecture hours)

3. **Human Population and the Environment**
   - Population growth, variation among nations.
   - Population explosion - Family Welfare Programme.
   - Environment and human health.
   - Human Rights.
   - Value Education.
   - HIV / AIDS.
   - Women and Child Welfare.
   - Role of Information Technology in Environment and human health.
   - Case Studies.

(6 lecture hours)

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PART-B

ESSAY TYPE WITH INBUILT CHOICE — 50 Marks

4. **Natural resources :**
   - **Renewable and non-renewable resources :**
     - Natural resources and associated problems.
       - Forest resources : Use and over exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
       - Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
       - Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
       - Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer - pesticide problems, water logging, salinity, case studies.
       - Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, Case studies.
       - Land resources : Land as a resource, land degradation, man induced landslides, soil erosion and desertification.
   - Role of an individual in conservation of natural resources.
   - Equitable use of resources for sustainable lifestyles.

(8 lecture hours)

5. **Ecosystems**
   - Concept of an ecosystem.
   - Structure and function of an ecosystem.
   - Producers, consumers and decomposers.
   - Energy flow in the ecosystem.
   - Ecological succession.
   - Food chains, food webs and ecological pyramids.
   - Introduction, types, characteristic features, structure and function of the following ecosystem :-
     - Forest ecosystem
     - Grassland ecosystem
     - Desert ecosystem
     - Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

(6 lecture hours)

6. Biodiversity and its conservation

- Introduction - Definition: genetic, species and ecosystem diversity.
- Biogeographical classification of India.
- Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.
- Biodiversity at global, National and local levels.
- India as a mega-diversity nation.
- Hot-spots of biodiversity.
- Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

(8 lecture hours)

7. Environmental Pollution

- Definition
- Causes, effects and control measures of:-
  - Air pollution
  - Water pollution
  - Soil pollution
  - Marine pollution
  - Noise pollution
  - Thermal pollution
  - Nuclear hazards
- Solid Waste Management: Causes, effects and control measures of
- Role of an individual in prevention of pollution.
- Pollution case studies.
- Disaster management: floods, earthquake, cyclone and landslides.

(8 lecture hours)

PART-C

ESSAY ON FIELD WORK **25 Marks**

8. Field work

- Visit to a local area to document environmental assets - river / forest / grass land / hill / mountain
- Visit to a local polluted site - Urban / Rural / Industrial / Agricultural
- Study of common plants, insects, birds.
- Study of simple ecosystems - pond, river, hill slopes, etc.

(5 lecture hours)

(Notes : i) Contents of the syllabys mentioned under paras 1 to 8 shall be for teaching for the examination based on Annual Pattern.

ii) Contents of the syllabys mentioned under paras 1 to 4 shall be for teaching to the Semester commencing first, and

iii) Contents of the syllabys mentioned under paras 5 to 8 shall be for teaching to the Semester commencing later.

LIST OF REFERENCES :-

1) Agarwal, K.C., 2001, Environmental Biology, Nidi Publ. Ltd., Bikaner.
2) Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad - 380 013, India, Email : mapin@icenet.net (R)
3) Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p
4) Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
5) Cunningham, W.P.Cooper, T.H.Gorhani, E & Hepworth, M.T., 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai, 1196p.
6) De A.K., Environmental Chemistry, Wiley Eastern Ltd.
7) Down to Earth, Centre for Science and Environment (R)
8) Gleick, H.P. 1993, Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press. 473p.
9) Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Mumbai (R)
10) Heywood, V.H. & Watson, R.T. 1995, Global Biodiversity Assessment, Cambridge Univ. Press 1140p
11) Jadhav, H & Bhosale, V.M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Delhi. 284 p.
12) Mckinney, M.L. & Schock, R.M. 1996, Environmental Science Systems & Solutions, Web Enhanced Edition. 639 p.
13) Mhaskar A.K., Matter Hazardous, Techno-Science Publications (TB)
14) Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co. (TB)
15) Odum, E.P., 1971, Fundamentals of Ecology, W.B.Saunders Co., U.S.A., 574p.
16) Rao M.N. & Datta A.K.,1987, Waste Water Treatment, Oxford & IBH Publ. Co. Pvt. Ltd. 345 p.
17) Sharma B.K., 2001, Environmental Chemistry, Goel Publ. House, Meerut.
18) Survey of the Environment, The Hindu (M)
19) Townsend C., Harper J., and Michael Begon, Essentials of Ecology, Blackwell Science (TB)

B.Com. (E- Commerce)

Appendix - P

B.Com. III
Semester V
e-COMMERCE - 1

Time : 3 Hours **Marks: 60**

Objective: The objective of the course is to familiarize the students with the essentials of internet based e-commerce and to make them comprehend its practical aspects as well as growth potential of e-commerce in India.

Unit I: Basics of e-commerce:

Meaning of e-commerce, Essential components of e-commerce, four basic models/ concepts of e-commerce, Operational scheme of e-commerce, Benefits of e-commerce, Limitations of e-commerce and e-commerce v/s traditional commerce

Unit II: e-commerce in India:

History of Internet, Initiation of internet in India, Growth of internet users in India, Current scenario of e-commerce in India, Government FDI policy about e-commerce in India, Future of e-commerce in India

Unit III: Retail e-commerce:

Concepts of Business to Consumer (B2C), Consumer to Business (C2B) and Consumer to Consumer (C2C) e-commerce, Consumers shopping procedure on internet, Disintermediation and re-intermediation in B2C, E-auction procedure and benefits

Unit IV: B2B e-commerce:

Meaning and characteristics of Business to Business (B2B) e-commerce, Key technologies for B2B e-commerce, E- Marketplace models of B2B- Supplier oriented marketplace, Buyer oriented marketplace and Intermediary oriented marketplace

Unit V: e- Payment and e- Banking:

Indian Payment Models, e-payments options, Electronic fund transfer (EFT), Credit cards and debit cards based payment, Use of mobile applications (apps) for e-payment, Meaning of electronic banking, online banking services, benefits of online banking, Future of online financial services in India

Books Recommended

1. Agrawala Kamalesh N and Agrawal Deeksha :
   Bride to Online Storefront, Macmillon India, New Delhi.
2. Agarwala Kamalesh N. and Agrawal Deeksha:
   Business on the Net- Introduction toe- Commerce; Macmillon India, New Delhi
3. Agarwala Kamalesh N. and Agrawal Deeksha:
   Bulls, Bears and The Mouse-An Introduction to Online Stock Market Trading; Macmillillon India, New Delhi.
4. Tiwari Dr. Murli Dr.:
   Education and E-Governance; Macmillon India, New Delhi.
5. Afuah A.and Tucci C.:
   Internet Business Models and Strategies; Mc Graw Hill, New York.

Internal Assessment Scheme

1. Theory paper will carry 60 marks and internal assessment 40 marks
2. 40 % Marks will be based on continue evaluation of the student assignment, class test, seminar and web-site visit /Industrial visit and project report.
3. Student will have to work under the guidance of the teacher and submit project report before fifteen days of the commencement of the theory examination.

Appendix - AF

B.Com. III
Semester VI
e-COMMERCE- II

Time : 3 Hours **Marks: 60**

Objective: The objective of the course is to acquaint the students with the internet- based e-commerce business models, internet marketing and e-governance.

Unit I: Internet e-commerce Business Models:

Social media model, advertising model, retail model, hybrid model, merchant model, informational model, drop-shipping model and revenue model.

Unit II: B2C Internet Marketing

Meaning of online marketing or internet marketing, online marketing strategies, marketing channels, internet branding, online publishing and advertising.

Unit III: B2B Online Marketing

Use of internet based electronic data interchange (EDI), Benefits of online marketing in B2B e-commerce, procurement reengineering, just in time delivery, online marketing issues.

Unit IV: E-governance:

Meaning of e-governance and e-government, Objectives of E-governance, Private sector interface in E-Governance, Concepts of government to Business (G2B), Business to Government (B2G), Citizen to Government (C2G),

Unit V: E- Governance Models

Application of Internet EDI in E-governance, E-governance in India, E-Governance Models, Comparative Analysis Model, Wider Dissemination Model, Critical Flow Model, E-advocacy Model

Books Recommended

1. Agrawala Kamalesh N and Agrawal Deeksha :
   Bride to Online Storefront, Macmillon India, New Delhi.
2. Agarwala Kamalesh N. and Agrawal Deeksha:
   Business on the Net- Introduction to e- Commerce; Macmillon India, New Delhi
3. Agarwala Kamalesh N. and Agrawal Deeksha:
   Bulls, Bears and The Mouse-An Introduction to Online Stock Market Trading; Macmillillon India, New Delhi.
4. Tiwari Dr. Murli Dr.:
   Education and E-Governance; Macmillon India, New Delhi.
5. Afuah A.and Tucci C.:
   Internet Business Models and Strategies; Mc Graw Hill, New York.

Internal Assessment Scheme

1. Theory paper will carry 60 marks and internal assessment 40 marks
2. 40 % Marks will be based on continue evaluation of the student assignment, class test, seminar and web-site visit /Industrial visit and project report.
3. Student will have to work under the guidance of the teacher and submit project report before fifteen days of the commencement of the theory examination.

Botany

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13. BOTANY

There shall be following paper and practical for B. Sc. Part – I Semester one examination. The syllabus is based on six theory periods and six practical periods per week (Total 75 – 80 theory sessions and 25 practical sessions per complete semester). There shall be one compulsory paper of 3 hours duration, in theory as stated below and practical examination extending for 4 hours. Every examinee shall offer the following paper of 100 marks (out of which 80 marks will be for written examination and 20 marks for internal assessment) and practical examination of 50 marks. Candidates are required to pass separately in theory and practical examinations.

1.	Paper – I		Marks
	a. Theory	-	80
	b. Internal Assessment	-	20
2.	Practical	-	50
	Total		**150 Marks**

13 – BOTANY

Diversity & Applications of Microbes and Cryptogams

UNIT-I : Plant Diversity **(15)**

1.1 Cyanobacteria and its impact on origin of life
1.2 Introduction to Plant Kingdom Cryptogams
1.3 Diversity of plants with respect to habitat, form, nutrition and ecological status
1.4 General Account of Viruses and structure of TMV and HIV
1.5 Bacteria: structure, Nutrition and reproduction
1.6 Role of microbes in Agriculture, Medicine and Industries

UNIT-II: Algae **(15)**

2.1. Classification according to F. E. Fritsch and G. M. Smith up to classes
2.2. General characters of algae with reference to Habitat, Thallus Cytologies

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UNIT-III : Fungi **(15)**

3.1. Classification according to Ainsworth (1973)
3.2. General characteristics of following classes with special reference to examples mentioned –
3.2.1. Mastigomycotina : Albugo (Cystopus)
3.2.2. Ascomycotina : Aspergillus
3.2.3. Basidiomycotina : Puccinia graminis-tritici
3.2.4. Deuteromycotina : General characters
3.3 Lichen-Types & Economic importance

Unit-IV : Bryophyte **(15)**

4.1. Classification according to G. M. Smith
4.2. General characters, thallus organization and life cycle of –
1.2.1. Hepaticopsida – Marchantia
1.2.2. Bryopsida – Funaria
4.3. Evolution of sporophyte in bryophytes
4.4. Affinities of bryophytes with algae and pteridophytes
4.5. Brief Account on some Indian Bryologist.

Unit-V : Pteridophyta **(15)**

5.1. Pteridophytes as First Vascular Plants.
5.2. Classification according to G. M. Smith
5.3. General characters of the following classes with special reference to examples mentioned –
5.3.1. Sphenopsida – Equisetum
5.3.2. Filicopsida – Marsilea
5.4. Stele types in pteridophytes
5.5 Heterospory and Seed Habit in Pteridophytes

Unit-VI : Application of Microbes Cryptogams **(15)**

6.1. Economic Importance of Algae with special reference to Food, Industries, Agriculture and Harmful aspects
6.2. Mycorrhiza – Types and Application.

(2) Study of Crustose, Fruticose & Foliose Lichen
(3) Study of symptoms of fungal, viral, bacterial and Mycoplasmal diseases
(4) Collection of fungal specimen & infected plant part from local region
(6) Demonstration of Mushroom Cultivation Technology

III. BRYOPHYTES

Study of external and anatomy features of vegetative and reproductive parts of following genera - Marchantia, Anthoceros, Funaria, Polytrichum and Sphagnum

IV. PTERIDOPHYTES

Study of Pteridophyte external and anatomy features of vegetative and reproductive parts of following genera -Lycopodium, Equisetum, Osmunda, Selaginella, Adiantum, Marsilea and any one fossil specimen

Note: 1. Omit the details of development of sex organs and sporophyte.
2. Botanical excursion (Two local and one outside the state is compulsory)
3. Common algal, fugal, pathological, bryophytic and pteridophytic collection and excursion report must be submitted at the time of practical examination.

BOOKS RECOMMENDED

1. Dube, H. C. (1990). An Introduction to Fungi. Vikas Pub. House Ltd. New Delhi.
2. Gangulee, H. C. and Kar, A.K. (2001). College Botany Vol. II. Books and Allied Press Ltd. Kolkata.
3. Krishnamurthy, K. V. (2007). An advanced Text Book on Biodiversity. Principles and Practice. Oxford and IBH Publishing Kumar, H.D. (1988). Introductory Phycology. Affiliated East-West Pres Ltd. New Delhi.
4. Kumar, H. D. and Singh, H.N. (1976). A Text Book of Algae. Affiliated East-West Pres Ltd. New Delhi.
10. Pathar, N.S. (1977). Biology and Morphology of Pteridophytes. Central Book Depot, Allahabad.
11. Parihar, N.S. (1984). An Introduction To Embryophyta Vol. I Bryophyta. Central Book Depot, Allahabad
12. Rashid, A. (1996). An Introduction To Bryophyta. Vikas Publishing House Ltd. New Delhi.
13. Saxena, A.K. and Sarbhai, R.M.(1992). A Text Book of Botany Vol.II Embryophyta. Ratan Prakashan Mandir, Agra.
14. Sharma, O.P. (1989). A Text Book of Fungi. Tata Mc Graw-hill Publishing Company Limited, New Delhi.
15. Sharma, O.P. (1990). A Text Book of Algae. Tata Mc Graw-hill Publishing Company Limited, New Delhi.
16. Smith, G.M. (1995). Cryptogamic Botany. Vol. II (Bryophytes and Pteridophytes). Mc Graw-Hill Book Company, New York and London.
17. Sporne, K.R. (1995). The Morphology of Pteridophyta. The Hutchinson University Library, London, U.K.
18. Varma, P. S. and Agrawal, V. K. (2000). Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand and Company (P.) Ltd. New Delhi.
19. Vashishta, B.R. (1997). Botany For Degree Students-Bryophyta. S. Chand and company (P.) Ltd. New Delhi.
20. Vashishta, P.C. (1984). Pteridophytes. S. Chand and company (P.) Ltd. New Delhi.
21. Sharma, P.D. (1998). The Fungi. Rastogi Publications, Meerut.
22. Smith, G.M. (1995). Cryptogamic Botany. Vol. I (Algae and Fungi). McGraw-Hill Book Company, New York and London.
23. Vashishta, B.R. (1995). Botany for Degree Students-Algae. S. Chand and Company (P.) Ltd. New Delhi.

7. BOTANY

3S-BOTANY

ANGIOSPERM SYSTEMATICS, ANATOMY & EMBRYOLOGY

UNIT I: **Angiosperm Systematics and Biodiversity.**

1.1 Angiosperms: Origin and Evolution (**Pteridospermous and Bennettitalean Theory**)

1.2 Botanical Nomenclature: Principles of rules, Taxonomic Ranks, Type concept, Valid publication.

1.3 Herbarium - Concept & significance, Royal Botanical Garden, Kolkata.

1.4 Concept of biodiversity, Ex situ and In situ conservation

1.5 Concept & importance of Biodiversity.

UNIT II: **Angiosperm Systematics**

2.1 Systems of Classification: Bentham and Hooker's System, Engler and Prantle's system.

2.2 Systematic studies & economic importance of following Families

Dicotyledons (Polypetalae) : Malvaceae, Brassicaceae, Leguminosae, Apiaceae,

UNIT III: **Angiosperm Systematics**

3.1 Systematic studies & economic importance of following Families

Dicotyledons (Gamopetalae): Asteraceae, Asclepiadaceae, Apocynaceae, Solanaceae, Verbenaceae, Lamiaceae.

3.2 Dicotyledons (Monochlamydeae): Euphorbiaceae.

3.3 Monocotyledons: Liliaceae, Poaceae.

UNIT IV: **Anatomy**

4.1 Types of Tissues:

Meristematic - Types of meristems

Permanent - Simple and complex.

4.2 Characteristics of growth rings, Soft wood and Hard wood.

4.3 Anatomy of root: Primary structure in dicot and monocot root, normal secondary growth in dicot root.

stem, normal secondary growth in dicot stem.

5.2 Anomalies in primary structure in *Boerhhavia* stem, secondary structure in *Bignonia* and *Dracaena* stem.

5.3 Leaf Anatomy: Internal structure in *Nerium* and Maize leaf.

UNIT VI : **Embryology**

5.1 Microsporangium, microsporogenesis, development of male gametophyte.

5.2 Megasporangium, types of ovules, megasporogenesis, development of female gametophyte (monosporic, Bisporic & tetrasporic).

5.3 Double fertilization and triple fusion.

5.4 Embryo - Classification of embryo.

5.5 Endosperm types & significance, Suspended animation

LABORATORY EXERCISES

1) Embryology of Angiosperms:
   i) Observation of wide range of flowers available in the locality and methods of their pollination.
   ii) Study through permanent slides of T.S. of anthers, microsporogenesis, L.S. of ovule, types of endosperms and embryo of Capsella.
   iii) Mounting of T.S. of anthers, Pollen grains and pollinia.
2) Anatomy of angiosperms : Preparation of double stained slides of root, stem and leaves of angiosperms mentioned in the syllabus.
3) Taxonomy : Description of ten plants belonging to different families in technical language and identification upto family level.
4) Long and short excursion is essential

Note: Field tour reports should be supported by exhaustive field notes and photographic representation of plant species studied

Brassicaceae- *Brassica*, **Malvaceae-** *Hibiscus, Sida, Malvastrum*, **Fabaceae-** *Crotalaria, Indigofera, Tephrosia*, **Caesalpinoidae-** *Caesalpinia, Cassia*, **Mimosoidae-** *Prosopis, Acacia*, **Apiaceae-** *Coriandrum*,

Apocynaceae- *Vinca, Thevetia*, **Asclepiadaceae-** *Cryptostegia Calotropis*, **Solanaceae-** *Datura, Solanum, Withania*,

14. Sabins, F.F. (2000) Remote Sensing Principles and Interpretations. W.H. Freeman and Company, USA.
15. Lillesand, T.M. and Kiefer, R.W.(2000) Remote Sensing and Image Interpretation. John Wiley and Sons Inc., New York.
16. Drury, S.A. (1997) Image Interpretation in Geology. Chapman and Hall, London.
17. Todd, D.K. (1980) Ground Water Hydrology. John Wiley and Sons Inc. New York.
18. Karanth, K.R. (1989) Hydrogeology. Tata McGraw Hill Pub.Co.Ltd., New Delhi.
19. Nagabhushanlah, H.S. (2001) Groundwater in Hydrosphere (Groundwater Hydrology) CBS Publisher, New Delhi.
20. Karanth K.R. Groundwater, Assessment, Development and Management. Tata McGraw Hill Pub. Co. Ltd., New Delhi.
21. Raghunath : Ground Water Hydrology, New Age Publication, Pune

5S - BOTANY

PLANT PHYSIOLOGY AND ECOLOGY

Unit - I: Plant Water Relations

1.1 Importance of water to plant life. Imbibition , Diffusion,Osmosis, Plasmolysis.

1.2 Active and passive Absorption of water.

1.3 Ascent of sap - Root Pressure and Transpiration Pull Theory.

1.4 Transpiration - Types of transpiration, Stomata movements, Mechanism of transpiration (Starch Sugar hypothesis), Significance. Antitranspirant, Guttation

1.5 Mineral uptake - Active uptake - Carrier Concept Passive up take - Ion Exchange.

Study of morphological and anatomical adaptations in xerophytes -*Asparagus*, *Nerium*, *Casuarina*, *Euphorbia*, *Cycas*, *Opuntia* (any two)

3. Study of community characteristics by quadrat method.
4. Determination of water holding capacity of different soils.
5. To determine the texture of different soils by sieve method.

Ecology: Minor experiment (Any Two)

1. To determine the porosity of soil.
2. To determine the transparency and temperature of water bodies.
3. Estimation of salinity of different water samples
4. Determination of pH of different soils and water samples by pH papers/ pH meter.
5. Study of meteorological instruments -Rain gauge, Hygrometer, Barometer

PRACTICAL EXAMINATION

Time: 4 Hours Marks: 50

Q. 1 -	Physiology- major experiment.	15
Q. 2 -	Comment one Minor Physiology experiment.	5
Q. 3 -	Ecology major experiment.	10
Q. 4 -	Ecology minor experiment.	5
Q. 5 -	Viva – voce	5
Q.6 -	Class record.	5
Q. 7 -	Co-curricular Activity Report	5

Co-curricular Activity Report" which mean the report on the activity

Such as Study Tour, Industrial visit to Research Institute, Excursion Tour to be submitted by the students at the time of practical examination.

Books Recommended:

Plant Physiology and Ecology:

1. Curtis & Clark. : Introduction of Plant Physiology.
2. H.N.Shrivastav. : Plant Physiology
3. Devlin R.M. : Plant Physiology
4. Salisbury F.B and Ross C.W. (1992).: Plant physiology (Fourth Edition) Wadsworth Publishing Company, California,USA.
5. William G. Hopkins. (1995): Introduction to Plant Physiology. Published by – John Wiley and Sons, Inc.
6. V.Verma : Plant Physiology Verlag, New York.Vol. II.
7. Mayer & Anderson : Plant Physiology.
8. Lincoln Taiz and Eduardo Zeiger (2001). Plant Physiology (3rd edition), Published by Panima Publishing Corporation
9. Galston, A. W. 1989: Life processes in plants. Scientific American Library, Springer
10. Jain V.K.: Fundamental of plant Physiology. S. Chand Publication New Delhi.
11. Kocchar P.C.: Text Book of Plant Physiology.
12. Mohr, H. and Schopfer, P. 1995 : Plant Physiology 4th : Edition, Wordsworth
13. Moore, T.C. 1974: Research Experiences in Plant Physiology. A Laboratory Manual.
14. Mr./Mrs.Pillai : Plant Physiology New York, U.S.A.
15. P.S.Gill: Plant Physiology, S.Chand & Co. New Delhi, Edition - Pradip's, Botany
16. Purohar and Singh: Plant Physiology.
17. R. G. S. Bidwell (revised edn.)-Plant Physiology
18. Verma S.K. and Verma Mohit (2007). A.Text Book of Plant Physiology, Biochemistry and Biotechnology, S. Chand Publications.
19. Dennis D.T., Turpin, D.H. Lefebvre D.D. and Layzell D.B. (eds) 1997. Plant Metabolism (Second Edition) Longman, Essex, England.
20. Galstone A.W. 1989. Life processes in Plants. Scientific American Library, Springer Verlag, New York, USA.,
21. Moore T.C. 1989. Biochemistry and Physiology of Plant Hormones Springer – Verlag, New York,USA.
22. Singhal G.S., Renger G., Sopory, S.K. Irrgang K.D and Govindjee 1999. Concept in Photobiology; Photosynthesis and Photomorphogenesis. Narosa Publishing House, New Delhi
23. Verma S.K. and Mohit Verma 2007. A.T.B of Plant Physiology, Biochemistry and Biotechnology, S. Chand Publications.
24. Ambasht. R.S. 1988.0 A Text Book of Plant Ecology Students Friends Co. Varanasi.
25. Sharma P.D. 2003. Ecology and environment. Rastogi publication.
26. Botkin, D.B. and Keller, E.A. 2000. Environmental Plant (2nd edition) John Wiley & Sons Inc. New York.
27. Chapman. J.L. and Reiss. M.J. 1995. Ecology: Principles and Applications Cambridge University Press. College Publishers, USA.

Zoology

IX.ZOOLOGY

LIFE AND DIVERSITY OF NON-CHORDATA

UNIT-I : 1. Classification of Non-Chordata.
2. Phylum Protozoa: General characters.
3. Type study: Plasmodium vivax: Structure, Life cycle.
4. Parasitic protozoan and human diseases': Malaria, Amoebiasis, Trypanosomiasis, Leishmaniasis.

UNIT-II: 1. Phylum Porifera: General Characters.
2. Type study: Sycon: Habits and habitat, External features, cell types, spicules & Structure and significances of canal systems.
3. Phylum Coelenterata: General Characters.
4. Type study: Metridium: Habits and habitat, External features, Gastro-vascular cavity, Mesenteries, Reproduction.

UNIT-III: 1. Phylum Platyhelminthes: General Characters.
2. Type study: Fasciola hepatica: Habits and habitat, External features, Digestive, Excretory, Reproductive system and Life cycle.
3. Phylum Aschelminthes: General Characters.
4. Type study: Ascaris lumbricoides: Habits and habitat, External features, Digestive, Excretory, Reproductive system and Life cycle.

UNIT-IV: 1. Phylum Annelida: General Characters.
2. Type study: Leech: External features, Digestive, Excretory and Reproductive system.
3. Phylum Arthropoda: General Characters.
4. Type study: Cockroach: Habits and habitat, External features, Digestive system, Respiratory system, Reproductive system.

UNIT-V : 1. Phylum Mollusca: General Characters.
2. Type study: Pila globosa: Habits and habitat, External features (Shell and Body), Digestive, Respiratory and Repro-

ductive system.
4. Larval forms and their significance: Amphioxus, Planula, Trochophore, Bipinnaria, Brachiolaria.

LIFE AND DIVERSITY OF NON-CHORDATA

Practical : Two practical per week each of 3 period's duration. The Examination shall be of 4 hrs duration and of 50 marks.

I-Life and diversity of non-chordata

1. Observation, Classification up to classes and sketching of the following animals. (Specimens or Models):
   - Phylum Protozoa: *Plasmodium* (*trophozoite, Euglena, Entamoeba histolytica*.
   - Phylum Porifera: Sycon, Bath sponge, *Euplectella*.
   - Phylum Coelenterata: *Obelia, Aurelia, Tubipora*.
   - Phylum Helminthes: *Taenia, Ascaris* (male & female).
   - Phylum Annelida: Nereis, Earthworm, Leech.
   - Phylum Arthropoda: Prawn, *Limulus, Aranea, Scolopendra, Julus*, Moth, Mosquito.
   - Phylum Mollusca: Chiton, Pila, Dentalium, Unio, Octopus.
   - Phylum Echinodermata: *Asterias, Holothuria, Echinus*, Sea cucumber, Brittle star.
   - Phylum Hemichordata: *Balanoglossus*.
2. Study of Permanent slides:
   L.S.Sycon, gemmule, Ascaris egg, T.S. Ascaris through gonads, T.S.Leech through crop, Compound eye of insect, Radula, Gill lamella and Osphradium of *Pila*, Statocyst and Otocyst Prophorid of Nereis.
3. Anatomical Study through Computer Aided Techniques, Video Clipping Models, Photographs and other available resources :
   a) Leech/Earthworm: Alimentary canal, Reproductive system, Nervous system,

Distribution of Marks during Practical Examination: Time : 4 hrs.

i)	Identification and comments on spots (1-8) - 4 specimens, 4 slides	12 Marks
ii)	Labelling of Anatomical diagrams provided (Two)	10 Marks
iii)	Permanent stained micro preparation	08 Marks
iv)	Study tour diary -	04 Marks
v)	Permanent stained micro preparation Submitted by examinee.....	04 Marks
vi)	Certified class record -	05 Marks
vii)	Check list of 20 locally available invertebrate fauna.....	02 Marks
viii)	Viva- voce	05 Marks
	Total: -	50 Marks

Note:

1) One or two short excursion / study tours are compulsory for observation of animals in their natural habitat.
2) Candidates shall be required to produce at the practical examination the following
   - Practical record book duly signed by the teacher in charge and Certified by the Head of the department as bonafide work of the Candidate.
   - Five permanent stained micro preparations.
   - Study tour report and field diary duly signed by the teacher.

Reference Books Recommended (All latest editions):

1) Hickman, C.P. Jr.F.M. Hickman and L.S Roberts, Integrated principles of Zoology Mosby College publication St Louis.
7) Ayer F.F. and T.N Ananthakrishnan, Manual of Zoology Vol I (In-

8) Majpuria : Invertebrate Zoology.
9) Dhami and Dhami : Non-chordate Zoology.
10) Saini Prasad: Indian Zoological memoir. Pila.
11) R.L.Kotpal : Modern Text Book of Invertebrate Zoology.
12) Malviya M.K. Invertebrate Zoology, by Rajdhool publications.
13) S.S.Lal, Practical Zoology, Invertebrate.
14) Bhanwah H.S.and Kavita Juneja A text book of Invertebrate Zoology, Anmol Publication Pvt. Ltd., New Delhi.
15) Verma and Agarwal Practical Zoology, Invertebrate
16) - Barnes R.D. Invertebrate Zoology -(W.B. Saunders Co.)
17) P.G.Puranik and Thakur, Invertebrate Zoology.

17. INDUSTRIAL FISH AND FISHERIES

(vocational)

There shall be a following paper and practical for B.Sc.Part-I Semester One examination. The syllabus is based on 6 theory periods and six practical periods per week (Total 75-80 theory periods and 25 practical during the complete semester). There shall be one compulsory paper of 3 hours duration, in theory as stated below and practical examination extending for four hours. Every examinee shall offer the following paper of 100 marks, (Out of which 80 marks will be for written examination and 20 marks for internal assessments) and practical examination of 50 marks. Candidates are required to pass separately in theory and practical examination.

			Marks
1)	Paper-I: FISH BIOLOGY		
	Theory (Written)	.....	80
	Internal assessments	.....	20
2)	Practical:	.....	50
		Total:	**150 Marks**

	Theory (Written)	 80
	Internal assessments	 20
2)	Practical:	 50
	Total :	150 Marks

2S-ZOOLOGY

CELL AND DEVELOPMENTAL BIOLOGY

UNIT- 1. General organization of Prokaryote and Eukaryote Cell.
2. Ultra structure and functions of, Plasma membrane
3. Ultra structure types and functions of, Endoplasmic reticulum

UNIT-II: 1. Ultra structure and functions of, Golgi complex
2. Ultra structure and functions of Ribosome
3. Ultra structure and functions of Mitochondria.
4. Ultra structure and functions of Lysosomes.

UNIT-III:1. Ultra structure and functions of nucleus and nucleolus.
2. Chromosome and its general organization.

3. Permeability tests using erythrocytes.
4. Preparation of Polytene chromosome in Chironomus or Drosophila larva.
5. Preparation of various stages of mitosis in Onion root tip.
6. Preparation of various stages of meiosis in insect's testis.

II) Developmental Biology.

1. Study of stages of Gametogenesis in rat/frog. (Permanent Stained Slides)
2. Study of different of types animal eggs
3. Study of developmental stages (Life Cycle) of Cockroach, Housefly, mosquito, Butterfly, Moth, Frog (Any Four).
4. Sperm in physiological saline using phase contrast optics.
5. Demonstration of developing chick through available resources.
6. Developmental stages of frog: Cleavage, Blastula, gastrula, neurula, and tadpoles through available resources.
7. Permanent slides of chick embryos at 24, 36, 48, 72hrs of incubation.
8. Study of different types of placenta with suitable histological slides or visual diagrams.

Distribution of Marks during Practical Examination: Time : 4 hrs.

i)	Identification and comments on spots (1-8) -4 Cytological, 4 Embryological	16 Marks
ii)	Cytological Preparation	10 Marks
ii)	Comments on given Life Cycle	10 Marks
iv)	Certified class record -	05 Marks
v)	Submission of photographs of any three crop pests	04 Marks

11 Hot air oven.
12 Weighing Balance (Single Pan Balance)
13. Refrigerator

17. INDUSTRIAL FISH AND FISHERIES

(vocational)

There shall be a following paper and practical for B.Sc. Part-I Semester Two examination. The syllabus is based on 6 theory periods and

BSc.II Semester III
10. ZOOLOGY

There shall be the following paper and practical for B.Sc. Part-II Semester III examination. The syllabus is based on 6 theory periods and six practical periods per week (Total 75-80 theory sessions and 25 practical sessions during the complete semester). There shall be one compulsory theory paper of 3 hours duration, as stated below and a practical examination extending for four hours. Every examinee shall offer the following paper of 100 marks (80 for written examination and 20 marks for internal assessment) and a practical examination of 50 marks. Candidates are required to pass separately in theory and practical examination.

Semester III

1)	Paper-I: Life and diversity of Chordata and concepts of evolution	**Marks Allotted**
	Written examination.....	80
	Internalassessment.....	20
2)	Practical:	50
	Total:	**150 Marks**

Paper -3 S-Zoology
LIFE AND DIVERSITY OF CHORDATA AND CONCEPT OF EVOLUTION

Unit I : **Phylum Chordata:**

Origin of Chordata.

Protochordates:- Type study. Amphioxus: Habits and habitat, External Characters - Digestive system and feeding, Excretory organs, gonads- Affinities of Amphioxus.

.....

2. **General characters and Classification up to orders of the following chordates or as per the availability in the laboratory from the major orders, (Specimens or Models):**
Protochordata: Herdmania, Doliolum Salpa, Amphioxus.
Agnatha: Petromyzon, Myxine.
Pisces: Scoliodon, Torpedo, Acipenser, Exocoetus. Hippocampus
Amphibia: Ichthyophis, Salamander, Bufo, Hyla.
Reptilia: Varanus, Phrynosoma, Chamelcon, Cobra, krait, Russell's viper, Typhlops, Hydrophis
Aves: Duck, Woodpecker, Kingfisher, Parrot.
Mammalia: Mongoose, Squirrel, Manis, Bat., monkey.

B) **Dissections:**
1. Dissection - afferent and efferent branchial vessels, cranial nerves, internal ear of scoliodon.
2. Dissection - Digestive system, Arterial system, venous system, reproductive system of rat.
3. Permanent micro-preparations .a. Fish scales, b. Ampullae of Lorenzini. c. Eyeball muscles.
4. Observations of air bladder in air breathing fishes.

C) **Osteology.** Rabbit, Varanus (excluding loose bones of skull).

D) **Evolution:**
1. Study of fossils, including living fossils.
2. Study of Evidences of evolution.
   i) Analogous and Homologous organs.
   ii) Connecting links (Peripatus, Archaeopteryx, Limulus)
   iii) Embryological evidences
3. Application of Hardyweinberg's law
4. Study of Mesozoic Reptiles (By Models/Charts).
5. Mimicry, coloration in animals.
6. Beak and Leg modifications with reference to: Parrot, Woodpecker, Kingfisher, Heron, Duck, Sparrow, Pigeon

organ and mechanism of respiration, circulatory System: Structure and working of Heart, major arteries and veins, Lateral line receptors, Migration in fishes-Types, causes and significance.

Unit II : **Class Amphibia:**

Type Study:- *Rana tigerina*, Habits and habitat, external, characters. Respiratory organs- Circulatory system; Structure of Heart, major arteries and veins, urinogenital system.. Parental care in amphibia.

Class Reptilia:

Type study- *Calotes versicolor*- Habits and habitat, External characters, circulatory system- Structure of Heart, major arteries and veins. Urinogenital system, snake venom and anti-venom,

Unit III : **Class Aves:**

Type study: Pigeon-*Columba livia* Habits and habitat, External characters, Respiratory system,

urinogenital system. Flight adaptations, Migration in birds.

Class Mammalia:

Primitive mammals: salient features of Prototheria and Metatheria, Morphology of mammalian endocrine glands.

Aquatic mammals.

Unit IV : **Evolution:** Meaning and scope.

Indirect Evidences of evolution: Evidences of organic evolution- morphological and anatomical, physiological and biochemical, embryological.

Direct evidences of evolution: Palaeontological evidences: Fossils and fossilization: petrified fossils dead and preserve bodies cast and moulds, trails and foot prints, condition for fossilizations.-, Radioactive carbon dating of fossils -

Amphioxus:	T.S, Oral hood, Pharynx, Tail
Frog :-	T.S. lung. Stomach, Kidney; T.S. Intestine,
Rat:-	T.S. Liver, Pancrease, Ovary, Testes, Pituitary, Thyroid, Adrenal

DISTRIBUTION OF MARKS FOR PRACTICAL EXAMINATION

1.	Dissection: -	10
2.	Permanent stained micro preparation.	05
3.	Spotting. (Specimens, Slides, bones, fossil)	10
4.	Practical on evolution -	10
5.	Class record	05
6.	Viva - Voce	05
7.	Submission of study tour report.	05
	Total Marks:	**50**

BSc.II Semester IV

ZOOLOGY

There shall be the following paper and practical for B.Sc. Part-II Semester IV examination. The syllabus is based on 6 theory periods and six practical periods per week (Total 75-80 theory sessions and 25 practical sessions) during the complete semester. There shall be one compulsory theory paper of 3 hours duration the semester, as stated below and a practical examination extending for four hours. Every examinee shall offer the following paper of 100 marks (80 for written examination and 20 marks for internal assessment) and a practical examination of 50 marks. Candidates are required to pass separately in theory and practical examination.

B.SC. FINAL, SEMESTER-V
10 : ZOOLOGY

There shall be the following paper and practical for B.Sc. Part-III Semester V examination. The syllabus is based on 6 theory periods and six practical periods per week (Total 75-80 theory sessions and 25 practical sessions during the complete semester). There shall a compulsory theory paper of 3 hours duration, as stated below and a practical examination extending for five hours. Every examinee shall offer the following paper of 100 marks (80 for written examination and 20 marks for internal assessment) and a practical examination of 50 marks. Candidates are required to pass separately in theory and practical examination.

Theory -5 S-ZOOLOGY:
(ANIMAL PHYSIOLOGY AND ECONOMIC ZOOLOGY)

		Marks Allotted
1)	Written examination.....	80
	Internal assessment.....	20
2)	Practical:	50
	Total:.....	150 Marks

Paper 5 S-ZOOLOGY
(ANIMAL PHYSIOLOGY AND ECONOMIC ZOOLOGY)
Max. Marks - 100 Total **Period - 75**

UNIT II: Muscle Physiology:

Types of Muscles: striated, non-striated and cardiac muscles

E.M. Structure and **Chemical** Composition of striated muscle, Neuromuscular junction.

Mechanism of muscle contraction by Sliding filament theory

Physical and Chemical changes during muscle contraction: muscle twitch, tetanus, isometric and isotonic contraction, summation of Stimuli, all or none law, fatigue, rigor mortis.

UNIT III : Nerve Physiology: Neuron: E.M. Structure of neuron and Types : Myelinated and non-Myelinated nerve fibres.

Conduction of Nerve impulse, Resting potential, initiation and propagation of action potential, Saltatory transmission, Neurotransmitters (Acetylcholine, dopamine, GABA, Serotonin, Epinephrine, Nor-Epinephrine), Synapse and synaptic transmission

Chemical co-ordination: Endocrine system: Hormones and their physiological roles of-

Pituitary, Thyroid, Parathyroid, Adrenal, Islets of Langerhan's,
Hormonal disorders: Dwarfism, Gigantism, Acromegaly, Goitur, Myxoedema, Cretinism, Osteoporosis,

UNIT IV : Reproductive Physiology: Estrous and menstrual

iii) These Institutions which are already having Zoology museums should not procure museum specimens now onwards and should use charts / slides / models / photographs and digital alternatives in case of need. Those new institutions which are not having Zoology museum in their department should provide learning related to zoological specimens with the help of charts / slides / models / photographs and digital alternatives / and arrange visit of students to already established museums

Practicals:

1. Detection of blood groups in human being.
2. Differential counts of blood.
3. Estimation of hemoglobin percentage with the help of haemometer.
4. R.B.C. count.
5. W.B.C. count.
6. Preparation of haemin crystals
7. Measurement of blood pressure.
8. Action of salivary amylase on starch.
9. Qualitative detection of nitrogenous waste products (Ammonia, urea, uric acid) in given sample.
10. Demonstration of kymograph unit, Respirometer through available resources.
11. Observation and identification of Insect Pests of local crops, and predator insects.
12. Life Cycles of Honey bee, Lac insect, Silk Moth.
13. Histological Slides of major organs of Respiratory systems, circulatory system, Nervous system, Different types of Muscles, Endocrine glands, testis, ovary.
14. Study of locally available fishes, Indian major carps, Exotic carps, Common carp.

a) Spotting (A-F)	12
b) Description and Comments on Topic from Unit V and VI	08
04. Class record duly signed by teacher in charge and certified by H.O.D.	05
05. Study tour report.	05
06. Viva - voce	05
Total Marks	50

REFERENCES

1. Prosser and Brown : Comparative Animal Physiology
2. Hisotlogical Slides of Respirator systems, circulatory system, Muscles, Nervous system Endocrine glands, Gonads, placentae
3. Guyton : Physiology
4. Best and Taylor : Physiological basis of Medical practice
5. C'Hour, W.S., General and comparative Physiology. Prentice Hall of India.
6. Lehninger, L., Biochemistry. W.H. Freeman & co.
7. Nagabushnam, R., Animal physiology. S.Chand & co.
8. Martin, D.W. P.A. Mayes and W.W. Rodwell, Harper's Review of Biochemistry Inage Medical Publications.
9. Prosser, C.L. and F.A.Brown Comparative Animal physiology. W.B. Saunders,
10. Rama Rao, A.V.S.S., Biochemistry. UBSPD.
11. Stryer. L. Biochemistry Wiley International
12. Verma, P.S. and V.K. Agarwal., Animal physiology. S.Chand & co.
13. Wilson, J.A., Principles of Animal Physiology, Macmillan
14. Chatterjee, C.J; Human Physiology(Vol-I and II)
15. Economic Zoology, G.S. Shukla, V.B. Upadhyay (2006)
16. Text Book of Applied Zoology, Pradip. V Jabde (2005).
17. Mac E. Hadley: Endocrinology, Prentice Hall, International Edi-

Unit V **14L.**

A] Thermodynamics and Equilibriums: **[10]**

(i) Gibb's and Helmholtz's free energy function. Physical significance of Gibb's free energy. Change in free energy as a criteria of spontaneity and equilibrium. Variation of free energy G with P & T. Gibb's-Helmholtz's equation in terms of G and its application. (ii) Partial molal function, chemical potential, derivations of Gibb's-Duhem equation. Chemical potential of an ideal gas in gaseous mixture. Derivation of vant Hoff's isotherm and its application to equilibrium state. Derivation of vant Hoff's equation and its applications. (iii) Numericals.

B] Phase Equilibriums: **[4]**

(i) Immiscible liquids, Nernst distribution law and its application to association and dissociation of solute in one of the solvent. Process of extraction, derivation of formula for the amount of solute left unextracted after nth extraction. (ii) Phase transition - Clausius-Clyperon equation (only qualitative statement). (iii) Partially miscible liquids - Phase diagram of phenol-water, triethyl amine - water and nicotine-water systems. (iv) Numericals.

Unit VI **14L.**

A] Liquid state: **[4]**

(i) Surface tension, determination and its S.I. Unit. Effect of temperature on surface tension, derivation of expression for relative surface tension by Drop number method. Application of surface tension. (ii) Viscosity, determination and its S.I. Unit. Effect of temperature on viscosity, derivation of expression for relative viscosity by Ostwald's viscometer method. Applications of viscosity.

B] Electrochemistry: **[10]**

(i) Conductance of electrolytic solution. Specific, equivalent and molar conductance. Determination of conductance of electrolyte solution, variation of specific and equivalent

Semester- III

3S Chemistry Practicals

Total Laboratory sessions: 26 **Marks: 50**

Exercise I:

a) Volumetric Analysis

(Standard solutions to be prepared by students only)

16 Laboratory sessions

1) Prepare 0.1N oxalic acid standard solution and find out the acid neutralizing capacity of an antacid using NaOH as an intermediate solution.
2) Prepare 0.1N H_2SO_4 solution and find out its exact normality using NaOH as an intermediate solution and 0.1N oxalic acid as standard solution.
3) To determine the strength of oxalic acid by titration with $KMnO_4$
4) To determine percentage purity of Ferrous Ammonium Sulphate (FAS) by titration with $KMnO_4$
5) To determine strength of FAS by titration with $K_2Cr_2O_7$ using internal indicator.
6) To determine strength of $K_2Cr_2O_7$ by titration with FAS using internal indicator.
7) Estimation of copper (II) in commercial copper sulphate sample by iodometric titration.

b) Gravimetric Analysis

Estimation of Ba^{2+} as $BaSO_4$, Fe^{3+} as Fe_2O_3 using china and silica crucible and Ni^{2+} as Ni-DMG using sintered glass crucible.

Exercise II: Physical Chemistry experiments

10 Laboratory sessions

1) To determine refractive index by Abbe's refractometer.
2) To construct phase diagram of phenol-water system and to determine consolute temperature for the system.

3 : CHEMISTRY
Semester-V
5S Chemistry
(Effective from session 2015-16)

The examination in Chemistry of Fifth semester shall comprise of one theory paper, internal assessment and practical examination. Theory paper will be of 3 Hrs. duration and carry 80 marks. The internal assessment will carry 20 marks. The practical examination will be of 6 hours duration and carry 50 marks.

The following syllabi is prescribed on the basis of six lectures per week and 6 practical periods per batch per week. Each theory paper has been divided into 6 units. There shall be one question in every unit with internal choice for each of 12 marks & one compulsory question covering all the syllabus of Semester-V (8 marks).

5S Chemistry

Total Lectures: 84 ***Marks: 80***

Note: Figures to the right hand side indicate number of lectures.

Unit I **14L**

A] Coordination Compounds: Important terms namely molecular or addition compounds, double salts, complex salts, complex ion, ligand, coordination number, central metal ion, etc. Werner's theory of coordination and its experimental verification on the basis of conductance data and formation of AgCl precipitate in case of cobaltammines. Sidgwick's electronic interpretation and its drawbacks, effective atomic number. IUPAC rules for nomenclature of coordination compounds. Structural isomerism-ionization, linkage and coordination in complexes. Geometrical isomerism in octahedral complexes of the type Ma_4b_2, Ma_3b_3, $Ma_2b_2c_2$, Ma_2bc, $M(AA)_2b_2$. Square planar complexes of the type Ma_2b_2 and Ma_2bc. Optical isomerism in octahedral complexes of type $Ma_2b_2c_2$, Molecule, $M(AA)_3$, $M(AA)b_2$ and tetrahedral complexes of the type Mabcd and $M(AA)_2$. Optical isomerism in square planar complexes. Valence bond theory as applied [8]

B] Chelates : Definition, classification and applications of chelates in analytical chemistry. Stability of chelate with special reference to chelate effect. [3]

Unit II **14L**

A] Crystal Field Theory (CFT): Postulates of CFT, Crystal field splitting in octahedral, distorted octahedral, square planar tetrahedral complexes, concept of CFSE, high spin and low spin complexes on the basis of Δ_o and pairing energy, distribution of electrons in t_{2g} and e_g orbitals in high spin and low spin octahedral complexes. Factor affecting magnitude of crystal field splitting in octahedral complexes. [8]

B] Electronic Spectra of Transition Metal Complexes : Introduction to spectra, selection rules for *d-d* transitions, spectroscopic terms-determination of ground term symbols for d^1 to d^{10}, spectra of d^1 and d^9 octahedral complexes, Orgel diagram for d^2 and d^7 states, electronic spectrum of $[Ti(H_2O)_6]^{3+}$ complex ion. Spectrochemical series. [6]

Unit III **14L**

A] Heterocyclic compounds: Nomenclature, Pyrrole: Synthesis from acetylene, succinimide and furan, Basicity, Electrophilic substitution reactions (orientation) – nitration, sulphonation, acetylation and halogenation, Molecular orbital structure. [4]

Pyridine: Synthesis from acetylene and pentamethylene diamine hydrochloride, Basicity, Electrophilic substitution reactions (orientation) – nitration, sulphonation, Nucleophilic substitution reactions (orientation)- with $NaNH_2$, C_6H_5Li and KOH. [3]

B] Organometallic compounds: Grignard reagents: Methyl magnesium bromide- Synthesis from methyl bromide (only reaction) Synthetic applications: Electrophilic substitution reactions-formation of alkanes, alkenes, higher alkynes and other organometallic compounds, Nucleophilic substitution

20.COMPUTERSCIENCE
OR
20.COMPUTERAPPLICATION
OR
20.INFORMATIONTECHNOLOGY

The examination in Computer Science will comprise One theory Paper and Practical examination for each semester. The theory paper will be of 3 Hours Duration and carry 80 marks. The Practical examination will be of 4 Hrs duration and carry 50 marks.

The distribution of marks in Practical examination is given as. :

1)	Program writing / execution (on group A & B)	: 30 marks
2)	Practical / Record	: 10 marks
3)	Viva-voce	: 10 marks
	Total	**50 marks**

25 : Computer Science or Computer Application or Information Technology

Data Structure and Advance C

UNIT-I : Introduction to Data structure, type of data structures, list, array, stack and Queue, Algorithms of traversing, insertion and deletion operation on it.

UNIT-II: Linked list & its implementation, traversing, insertion, deletion algorithms, circular Queue.

UNIT-III : Tree : Binary, Binary search tree, tree Traversing : inorder, preorder and postorder, sorting and searching Techniques : Bubble sort, insertion sort and selection sort, linear search, Binary search.

fgetc(), fputc(), fputs(), fgets(), fputs(), fscanf(), fprintf(), fread(), fwrite().

Practical : Minimum 16 Practical based on

A. Data structure using C Language

B. C language covering aspectus of syllabus.

Study Tour : Study tour may be arranged to computer industry or software development organisation or software technology Park Or IT park

Hardware :

I) List of Equipment :
- a) No. of Computers 10 Nos. Desirable configuration
- b) Printer - Minimum 2 Nos.

II) Accessories
1) Pen. Drives 2 Nos.
2) Printer Ribbon / Toener
3) Stabiliser / UPS
4) Internet facility

- Legal Software for the syllabus.
- List of books.

1) Introduction to Data structure : Tremble, Sorenson.
2) Introduction to Data structure : Bhagat Singh, Mops.
3) Fundamentals of Comp Algorithm : Horowitz & Sohani.
4) Introduction to Data Structure in C : Pearson.
5) Programming in C : E Balguruswami : TMH Publication.
6) Programming with C : Venugopal K.R. TMH, Publication.
7) Programming in ANSIC : Ramkumar and Rakesh Agrwal
8) Programming with C : Byron Gottfried, Schaum Series Publication.

21. COMPUTER APPLICATION (VOCATIONAL)

5. S.C Gupta, V.K. Kapoor: Fundamentals of Applied Statistics, Sultan Chand and sons.
6. Cochran W.G. and Cox G.M.(1957): Experimental Designs, John Wiley and Sons.
7. Das M.N. and Giri (1986): Design and Analysis of Experiments, Springer Verlag.
8. Goon A.N., Gupta M.K., DasGupta B.(1983): Fundamentals of Statistics, Vol.II, World Press Calcutta.
9. Kempthorne O. (1965):The Design and Analysis of Experiments, Wiley Eastern.
10. Clark: Statistics and Experimental Designs.

List of Practicals : (6S Statistics)

1. Solution of LPP by graphical method.
2. Solution of LPP by simplex method.
3. Computation of initial basic feasible solution to transportation problem by various methods.
4. Problems on assignment problem.
5. Problems on sequencing problem with n jobs with two machines.
6. Problems on two-person zero sum games with saddle points.
7. ANOVA: One way classification.
8. ANOVA: Two way classification with one observation per cell.
9. ANOVA: Two way classification with multiple but equal number of observations per cell.
10. Analysis of completely randomized design.
11. Analysis of randomized block design.
12. Analysis of Latin square design.
13. Analysis of 2^2 and 2^3 factorial experiments arranged in RBD.

Note : The above practicals may be performed by using various statistical softwares.

List of equipments and instruments required for a batch of students in U.G. statistics laboratory.

1.	Twelve digit desk model electronic calculators.	20
2.	Biometrica tables Vol.I and Vol. II	02
7.	Statistical poster and chart	02
8.	Statistical softwares like SPSS, SAS, MS Excel and R	

12 : COMPUTER SCIENCE

55-COMPUTER SCIENCE
RDBMS AND VISUAL BASIC

UNIT-I : **Fundamental of DBMS :** Architecture of a database system,, data independence, database models; Relational Hierarchical, network; data dictionary.

UNIT-II: **Relational Model :** Relations, Domains and Attributes keys, E-R diagrams, Reducing E-R diagrams to tables, function dependency, Normalization Process, Normal forms : 1NF, 2NF, 3NF, 4NF, BCNF.

UNIT-III : **Introduction to SQL :** Components of SQL, data types, operators, DDL Commands : CREATE, ALTER, DROP, for tables & views. DML Commands : SELECT, INSERT, DELETE & UPDATE, Clauses : ORDER BY, GROUP BY and HAVING;

UNIT-IV : **Introduction to Visual Basic :** Visual programming, event driven programming, VB Environment : New Project window, property window, Form layout window, toolbar, menu bar, tool box, form window;
Managing Control : Form properties, pointer tool, label control, text box, command button, picture box, image control, event procedure.

UNIT-V : **Creating Menus :** Application wizard for menu, menu editor, creating menu, adding code to menus, data types & variables.
Operators : Conditional operators, logical operators, control structures : If else, Nested If—else, select case, goto, do loop, for loop, nested for loop.

UNIT-VI : **Introduction to Internal Functions :** Msgbox(), named constant, default buttons, specifying icons.

Chemistry

Art's and Commerce College, Warwat Bakal

Tq-Sangrampur Dist- Buldana

Department of Chemistry

Certificate

This is to certify that Mr. /Ms. Vaishnavi Yuvraj Tayde

BSc IInd year Class (Sem.) IIIrd Roll No. 21 Studying in the academic year 2022-23 of this institute has completed project assignment based on syllabus & given satisfactory account of it in this book.

Date:

Teacher in charge

28-11-2022

HOD

Art's and Commerce College, Warwat Bakal

Tq-Sangrampur Dist- Buldana

Department of Chemistry

Name of Student: Vaishnavi Yuvraj Tayde

Class: BSc IInd year (sem-IIIrd)

Roll Number: 21

Topic: Global warming causes and effects

Date:

Teacher In charge

Name – Vaishnavi Yuvraj Tayde

Bsc 2nd year (Sem -3rd)

Subject – Chemistry

Topic – Global warming causes and effects

Global Warming Definition

"Global warming is a gradual increase in the earth's temperature generally due to the greenhouse effect caused by increased levels of carbon dioxide, CFCs, and other pollutants. "

- **Table of Contents -**

- **What is Global Warming?**

Global warming is the phenomenon of a gradual increase in the temperature near the earth's surface. This phenomenon has been observed over the past one or two centuries. This change has disturbed the climatic pattern of the earth. However, the concept of global warming is quite controversial but the scientists have provided relevant data in support of the fact that the temperature of the earth is rising constantly.

There are several causes of global warming, which have a negative effect on humans, plants and animals. These causes may be natural or might be the outcome of human activities. In order to curb the issues, it is very important to understand the negative impacts of global warming.

- **Causes of Global Warming**

Following are the major causes of global warming:

- **Man-made Causes of Global Warming**
- **Deforestation**

Plants are the main source of oxygen. They take in carbon dioxide and release oxygen thereby maintaining environmental balance. Forests are being depleted for many domestic and commercial purposes. This has led to an environmental imbalance, thereby giving rise to global warming.

- **Use of Vehicles**

The use of vehicles, even for a very short distance results in various gaseous emissions. Vehicles burn fossil fuels which emit a large amount of carbon dioxide and other toxins into the atmosphere resulting in a temperature increase.

- **Chlorofluorocarbon**

With the excessive use of air conditioners and refrigerators, humans have been adding CFCs into the environment which affects the atmospheric ozone layer. The ozone layer protects the earth surface from the harmful ultraviolet rays emitted by the sun. The CFCs have led to ozone layer depletion making way for the ultraviolet rays, thereby increasing the temperature of the earth.

Industrial Development

With the advent of industrialization, the temperature of the earth has been increasing rapidly. The harmful emissions from the factories add to the increasing temperature of the earth.

In 2013, the Intergovernmental Panel for Climate Change reported that the increase in the global temperature between 1880 and 2012 has been 0.9 degrees Celsius. The increase is 1.1 degrees Celsius when compared to the pre-industrial mean temperature.

- **Industrial Development**

With the advent of industrialization, the temperature of the earth has been increasing rapidly. The harmful emissions from the factories add to the increasing temperature of the earth.

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- **Agriculture**

Various farming activities produce carbon dioxide and methane gas. These add to the greenhouse gases in the atmosphere and increase the temperature of the earth.

- **Overpopulation**

An increase in population means more people breathing. This leads to an increase in the level of carbon dioxide, the primary gas causing global warming, in the atmosphere.

- **Natural causes of global warming -**

Volcanoes

Volcanoes are one of the largest natural contributors to global warming. The ash and smoke emitted during volcanic eruptions goes out into the atmosphere and affects the climate.

- **Water Vapour**

Water vapour is a kind of greenhouse gas. Due to the increase in the earth's temperature, more water gets evaporated from the water bodies and stays in the atmosphere adding to global warming.

- **Melting Permafrost**

Permafrost is frozen soil that has environmental gases trapped in it for several years and is present below Earth 's surface. It is present in glaciers. As the permafrost melts, it releases the gases back into the atmosphere, increasing Earth's temperature.

- **Forest Blazes**

Forest blazes or forest fires emit a large amount of carbon-containing smoke. These gases are released into the atmosphere and increase the earth's temperature resulting in global warming

Effects of Global Warming

Following are the major effects of global warming:

- **Rise in Temperature**

Global warming has led to an incredible increase in earth 's temperature. Since 1880, the earth's temperature has increased by ~1 degrees. This has resulted in an increase in the melting of glaciers, which have led to an increase in the sea level. This could have devastating effects on coastal regions.

- **Threats to the Ecosystem**

Global warming has affected the coral reefs that can lead to the loss of plant and animal lives. Increase in global temperatures has made the fragility of coral reefs even worse.

- **Climate Change**

Global warming has led to a change in climatic conditions. There are droughts at some places and floods at some. This climatic imbalance is the result of global warming.

- **Spread of Diseases**

Global warming leads to a change in the patterns of heat and humidity. This has led to the movement of mosquitoes that carry and spread diseases.

- **High Mortality Rates**

Due to an increase in floods, tsunamis and other natural calamities, the average death toll usually increases. Also, such events can bring about the spread of diseases that can hamper human life.

- **Loss of Natural Habitat**

A global shift in the climate leads to the loss of habitats of several plants and animals. In this case, the animals need to migrate from their natural habitat and many of them even become extinct. This is yet another major impact of global warming on biodiversity.

- **Frequently Asked Questions**

What is global warming?

Global warming is the phenomenon of gradual increase in the average temperature of earth . It is caused by the release of greenhouse gases like carbon dioxide, methane, CFCs etc. into the atmosphere.

What do CFCs stand for? What is the role of CFC in global warming?

CFCs stand for chlorofluorocarbons. Ozone layer is responsible for protecting the surface of the earth from the sun's harmful radiations. CFCs destroy the ozone layer of the atmosphere. This makes the way for the ultraviolet rays to reach the earth, thus, increasing the temperature which leads to global warming.

How does global warming affect climate change?

The change In climatic conditions is a result of global warming. The burning of fossil fuels, cutting down of trees etc. causes the temperature of the earth to increase. High temperature changes the weather patterns, causing the dry areas to get drier and wet areas to get wetter. Thus, increasing the frequency of disasters like floods, droughts etc.

How can we control global warming?

The release of carbon dioxide and other greenhouse gases into the atmosphere is the major cause of global warming. It can be reduced by setting a high price of carbon, increasing the biofuels production from organic waste, use of renewable energy like solar and wind power, safeguarding forests and improving energy efficiency and vehicle fuel economy.

Arts & Commerce College ★ Warvat Bakal ★

Principal
Arts & Commerce College,
Warvat Bakal Dist.Buldana

Thank you!

Art's and Commerce College, Warwat Bakal

Tq-Sangrampur Dist- Buldana

Department of Chemistry

Name of Student: Yogesh Gajanan Gadge

Class: B.Sc II (CBZ) Sem - IV

Roll Number: 31

Topic: Application of Chemistry In Pharmaceutical Industry

Date:

Teacher In charge

Sant Gadge Baba Amravati University, Amravati

Satpuda Education Society, Jalgaon Jamod's

Arts Commerce College Warvat Bakal

Department of Chemistry

2022 - 2023

PROJECT ASSIGNMENT

Topic: Application of Chemistry in Pharmaceutical industry

Submitted by: Yogesh Gajanan Gadge

Class: B.Sc II (CBZ)

Semester: Sem - IV

Date:

Teacher Incharge **HOD**

INTRODUCTION TO PHARMACEUTICAL CHEMISTRY

Pharmaceutical chemistry

- The chemistry which studies about the drug design and synthesis of biologically active molecules is known as pharmaceutical chemistry
- Pharmaceutical Chemistry involves development and the study of drugs , Drug discovery, Metabolism, absorption, delivery etc. are included in this

Careers

- Pharmacetical companies
- Biotechnology companies
- Drug development & research facilities etc.

Objective

Its main aim is to ensure the fitness for the purpose of medicinal products by analsing and evaluating them as per the quality control standards

Following are some objectives of pharmaceutical chemistry

- To enhance the knowledge base required for synthesis, Isolation, Purification
- To enhance Skill for effective handling of chemicals, glasswear etc.
- To provide proper qualities and skills to the students required to fulfill their job responsibilities as chemist
- To train the students about effect of chemicals

Scope

Skills required in pharmaceutical chemistry

- Good writing and verbal communication skills
- Synthetic organic chemistry skills
- Ability to purify drugs and intermediates
- Spectoscopic techniques
- Understanding of biological roles drugs
- Team work and interpersonal skills
- Good communication skills etc.

ERRORS

→ Error is a mistake but rather a difference between a computed / estimated measured value and the accepted true / specified / theoretically correct value

Classification of error

- Systematic / Determinate / Non random errors
- Non systematic / Indeterminate / Random / Accidental errors
- Gross error

1) Systemic error :- The error is constant or changes slightly bu consistent fault during the analysis.
Eg :- error in titration

- **Instrumental error :-** Error occurs due to faulty instrument or reagent containing impurities
- **Operational / Personal :-** When error occur during operation or carryout the experiment is calles as operational error
- **Methological error :-** These error are most serious errorr of analysis most of above error can be minimized or corrected but errors that are not changeable unless the condition of the determinations are alterted.
  Eg : Errors occer due to co-precipitation of impurities

2) Non-systematic error :- The error unpredictable and difficult to identify

Source

- Presence of bubbles in burette
- Sample handling improperly

3) Gross error :- These error are a combination of both systematic and non-systematic error
They are the result of big mistake made during analysis and can be identified easily
Gross error is also known as Avoidable mistake

Source

- Calculation error
- Wrong sample sizes
- Mix up of samole / reagent
- Transcription error

Accuracy and Precision

Accuracy :- It can be said that the difference between calculated value and accepted real value is known as accuracy

Precision :- Reproducibility or Repeatability can be defined as the precision of measurement system in which the degree of repeated measurement is considered under the static condition given the same result

Repeatability :- It is the variation which arise in spite of all the efforts made to keep the condition constant wheather relased to instrument and repeating in short term span

Reproducibility :- It is the variation which arise by applying the same process for the measurement by using different instrument and operators over a longer time span

Significant figure

The significant figure of any number are the digits that add up to the precision

Rule

- Non – zero digits are significant
  Eg : 89, 56,78,etc
- Zero between teo non – zero digits are significant
  Eg : 108, 805 etc
- Leading zero are consider insignificant
  Eg : 0.00098, 0.000643 etc
- Trailing zeros after a decimal point are significant
  Eg : 12.7900, 6.900 etc

Impurities in pharmaceuticals

→ An impurities is generally considered as an there various organic material except the other drug substance that arises during the manufacturing process.

Raw material employed in manufacture :- Impurities resulting from raw material many affect the process of manufacture and contaminate the resultant product Eg: Calcium sulphate & magnesium chloride present rocksalt some amount of calcium & magnesium will present in sodium chloride

Reagents used in the manufacturing process :-The impurities from the reagents may contaminate the final product if they are not washed away properly.

Eg : Mixing mercuric chloride solution with dilute ammonia solution result in ammoniated

$$HgCl_2 + 2NH_4OH \longrightarrow NH_2Hgcl + NH_4cl + 2H_2O$$

Ammonium hydroxide present in the final product

Process used in manufacture :- Different manufacturing process are used for producing many drugs and chemicals during there process of manufacturing, some impurities get an access into the materials

- Formulation related impurities
- Synthesis intermedicates & byproduct
- Residual solvent
- Method related impurities
- Chemicals process used in manufacture

Environment related impurities :-Atmosphere in industial areas is adulterated with gases like Hydrogen, sulphide, smoke,etc

- Exposure to adverse temperature
- Uv ligits
- Humidity

Effects of impurities in pharmacopoeial substance

A little amount of impurities always remain in a material

- After a certain period , even a minute quantity of impurite cause toxic effect
- Impurities also bring about technical difficulties in the formulation
- Impurities also reduce the self-life of a substance
- Some impurities result in incompatility with other substance
- Impurities also effect in physical and chemical properties of substance

Limit tests

Quantitive tests intended for identifying and controlling small quanties of impurities which may occer in a substance are termed as limit test

Limit test used for :-

1. Finding out the quantity of harmful impurities
2. Finding out the quantity of avoidable impurities

Arsenic

This test is carried out for controlling the arsenic impurities on inorganic substance

Principal :- The limit test for arsenic is based on the reaction in which arsenic is converted in arsine (AsH_3) by undergoing reduction with zinc and hydrochloric acid. The use of Stannated hydrochloric acis is prescribed in the I.P

$$\underset{\text{Arsenic Acid}}{H_3AsO_4} \longrightarrow \underset{\text{Arseneous Acid}}{H_3AsO_3}$$

$$H_3AsO_3 + 6H_2 \longrightarrow \underset{\text{Arsine}}{\uparrow AsH_3} + 3H_2O$$

When arsine comes in contact with dry paper daturated with mercuric chloride | bomide it produce a yellow or brown stain

$$2AsH_3 + Hgcl_2 \longrightarrow Hg \begin{matrix} \rightarrow AgH_2 \\ \searrow AgH_2 \end{matrix} + 2Hcl$$

The intensity of the colour produce is proportional to the amount of arenic present, if the diameter of the paper exposed to arsine os constant

The test solution of the sample is compared with the standard solution with known amount of arsenic

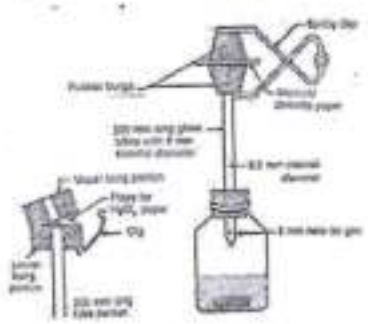
The strain are the compared in natural light

Apparatus : Rubbercork,springclip,mercuric chloride,paper,200mm long glass tube with 8mm external diameter 200mm, etc

Procedure :

Test solution : The test solution is prepared as directed in the monograph and placed in the generator bottle 5 ml of 1m potassium iodide, 5ml of stannous chloride acid solution and 10gm of zinc AsT are added to the test solution

A test paper of mercuric chloride is placed in the rubber slit and the bottle is immediately stopped . The reaction is allowed to continus for 40 min at above 40°c.



Standard solution : 0.33 gm of arsenic triocide is dissolved in 5 ml of 2m NaOH solution and volume is made up to 250 ml with water 1ml of this solotion is further diluted with distilled water up to 100 ml

The stain produced by the test sample passes the test if the stain produced by it is less intense than that of the standard solution

Chloride

Limit test of chloride

This test is carried out for identifying the chloride ions present in a standard solution

Principal

- The limit test for chloride is based on a reaction that occurs between silver nitrate and soluble chloride which is insoluable in dilute nitric acid.
- The test solution appears turbid due to the formation of silver chloride in the presence of dilute nitric acid . Amount of chloride present in the test samples influences the degree of turbidity.
- Test solution is compared with the standard solution.
- By viewing transversly through both the solution against a black background in nessler's cylinder is compared the samples passes the limit test if the test solution is less turbid than the standard solution and fails in vice versa condition.

Procedure

In this limit test a standard solution and test solution is prepared and then the appearance of there two solution is compared

Test solution :- 1.0 gm of sample is accurately weighted and transferred to nessler cylinder dislove in 10 ml distill water . 1 ml of nitric acid is added to this sol and volume up to 50 ml with distill water . 1 ml of silver nitrate be added to the solution stirring for 5 min after which turbidity develop

Specified substance (1gm) + 10 ml of water + 1 ml of nitric acid + water up to 50 ml + 1 ml silver nitrate turbidity

Standard solution :- 1 ml of 0.01 m Hcl is mixed with 1 ml of nitric acid in nessler cylinder B and volume up to 50 ml with distill water . 1 ml of silver nitrate solution which produce turbidity after 5 min

The sample passes the limit test if it is less turbid than the standard solution

Sulphate

Limit test for sulphate

This test is carried out for controlling the sulphate impurity in inorganic substance

Principle

In the limit test for sulphate, barium chloride reacts with soluable sulphate in the presence of dilute Hcl solution . The resulting turbid solution is compared with the standard solution of acceptable limit.

The barium sulphate reagent contain barium chloride , sulphate free alcohol, and potassium sulphate

Procedure

Test solution :- 1 gm of sulphate is weighted and 2 ml of Hcl is added to 45ml of solution. 5 ml of $BaSo_4$ reagent is added to prepare the solution

Standard Solution : 1 ml of 0.1089 % w/v solution of K_2So_4 is weighted and treated with 2ml of Hcl . This solution is diluated up to 45 ml .At the last the standard solution is prepared by adding 5 ml of $BaSo_4$ reagent

The limit test of sulphate is passes if it is less turbid than the standard solution

Iron

Limit test of Iron

This test is carried out for controlling the iron impurities in inorganic sunstance

Principle:- The limit test for iron relies on the reaction in which iron reacts with thioglycollic acid in a solution. With ammonium citrate buffer
It results in the formation of a purple colour solution due to the formation of mercaptoacetate
This purple colour is compared with the standard colour containing a known amount of iron

Procedure

Test solution :- 40 ml of water is added to the sampleand treated with 2 ml of 20% w/v citric acid .Then 2 drop of thioglucollic acid is added the solution is mixed made alkaline with ammonia , and

volume made up to 50 ml . Then the solution is allowed to stand for 5 min so that a colour develop which is viewed vertically & compared with the standard solution

Standard solution :- 40 ml of water is added to 2 ml of standard solution of iron .Then 2 ml of 20 % w/v citric acid and 2 drop of thioglycollic acid is added to the solution the solution is made alkaline with ammonium and volume is made up to 50 ml .The solution is allowed to stand for 5 min so that a colour develop which is viwed vertically and compared with the test solution

When the colour of both the solution is compared the intensity of the colour of the test solution should be less than that of standard solution

Heavy Metals

Limit test for Heavy metals

This limit test is carried out for determining the content of metallic impurities coloured by sulphide ion , under specific condition

Principle:-

Limit test for heavy metals are based on the reaction between a solution of a heavy metals and a saturated solution of H_2S in an acidic medium

A reddish / black colour resulted is compared with the standard solution of lead nitrate solution

Procedure:-

Test solution :- 25 ml of test solution is prepared in a 50 ml of nessler cylinder and ph is adjusted between 3-4 using dilute acetic acid or dilute ammonia solution , After PH adjustment the solution is diluted up to 35 ml with water

Standars solution :- 2 ml of standard lead solution is prepared out in a 50 ml nessler cylinder and diluted up to 25 ml with water. The pH is adjusted between 3-4 using dilute acetic acid pr dilute ammonia solution After pH adjustment the solution is diluted u to 35 ml with water

After that

10 ml of freshly prepared hydrogen sulphide solution is added into both the cylinder containing standard solution and test solution and diluted up to 50 ml with Water .After dilution the solution is krpt aside over a white surface for 5 min and viewed down wards the test solution colour is lighter than the standars solution colour

Arts & Commerce College * Warvat Bakal *

Principal
Arts & Commerce College,
Warvat Bakal Dist.Buldana

Art's and Commerce College, Warwat Bakal

Tq-Sangrampur Dist- Buldana

Department of Chemistry

Name of Student: Sagar Sheikeushraj Gudge.

Class: BSc III^rd yes [Sem V]

Roll Number: 50

Topic: Role of ozone layer.

18/11/22

Teacher In charge

Date:

Art's and Commerce College, Warwat Bakal

Tq-Sangrampur Dist- Buldana

Department of Chemistry

Certificate

This is to certify that Mr. /~~Ms~~ Sagar Shrikrushan Gadge.

BSc. III Class (Sem.) V Roll No. 50 Studying in the academic year 2022 of this institute has completed project assignment based on syllabus & given satisfactory account of it in this book.

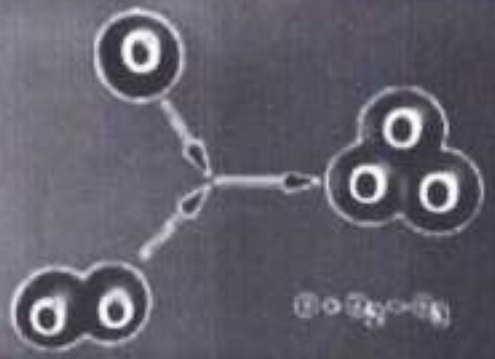
Date:

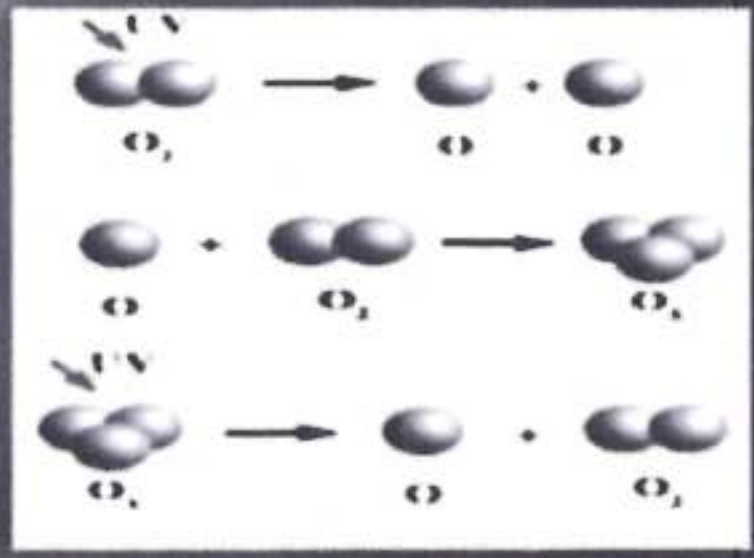
Teacher in charge

HOD

WHAT IS THE OZONE?

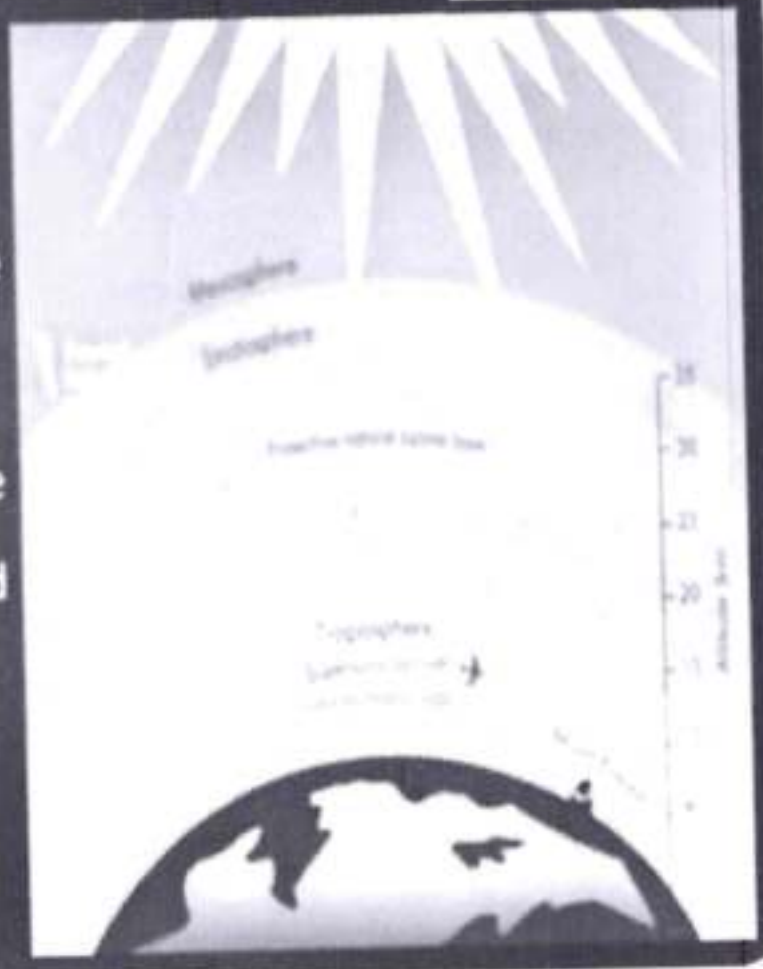
- Ozone (O3) molecules consist of three oxygen atoms that forms when free Oxygen molecules bond to O2 molecules.
- This gas is extremely rare in the atmosphere, representing just three out of every 10 million molecules.
- Ozone is highly corrosive and toxic and is used as a disinfectant.
- Ozone gas can be created or destroyed by the sun's UltraViolet rays.





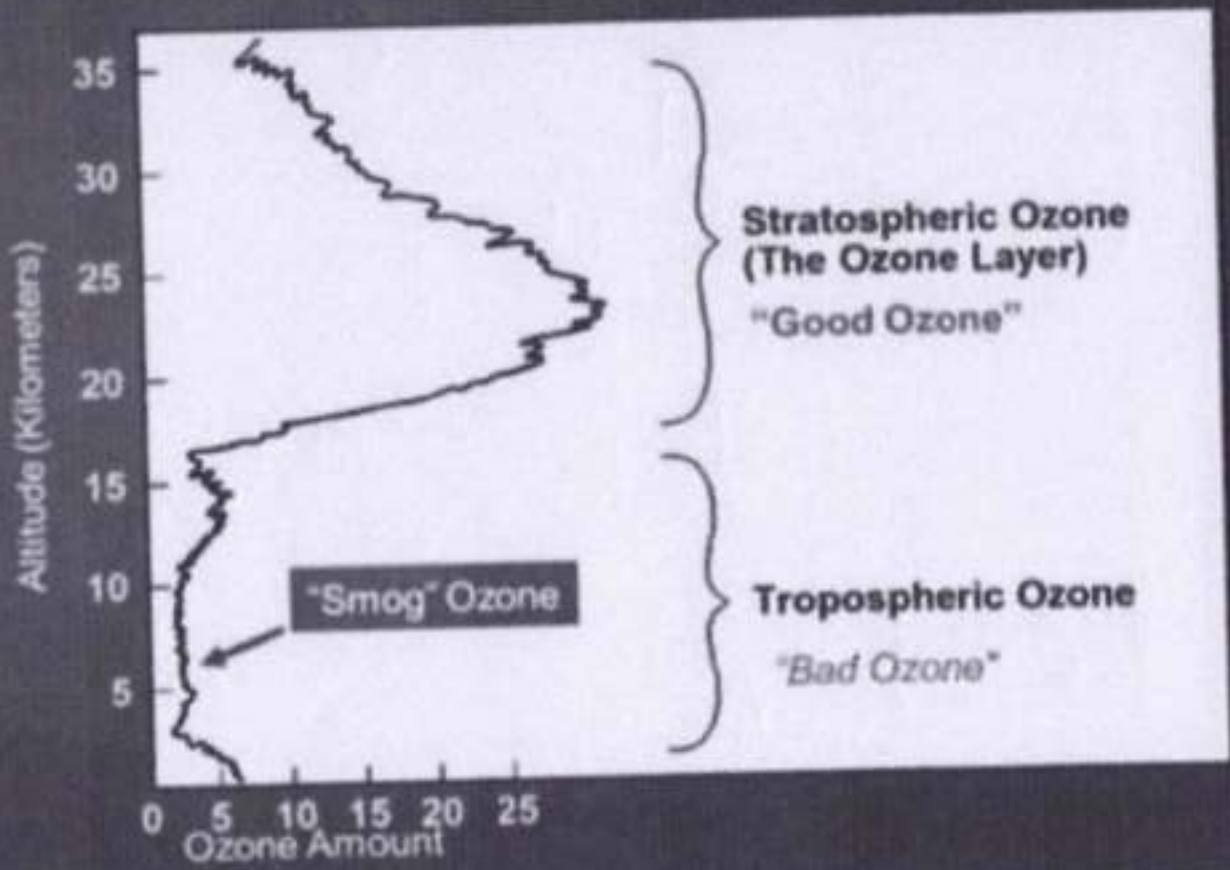
THE OZONE – WHERE IT IS ?

- Ninety percent of ozone exists in the upper atmosphere, or stratosphere, between 10 and 50 km above the earth.
- It is thinnest around the equator and denser at the poles.
- It can be found in small concentrations in the troposphere where it is considered a pollutant or Bad Ozone
- Ozone levels are reported in Dobson Units (DU) & 300 DU is an average value.



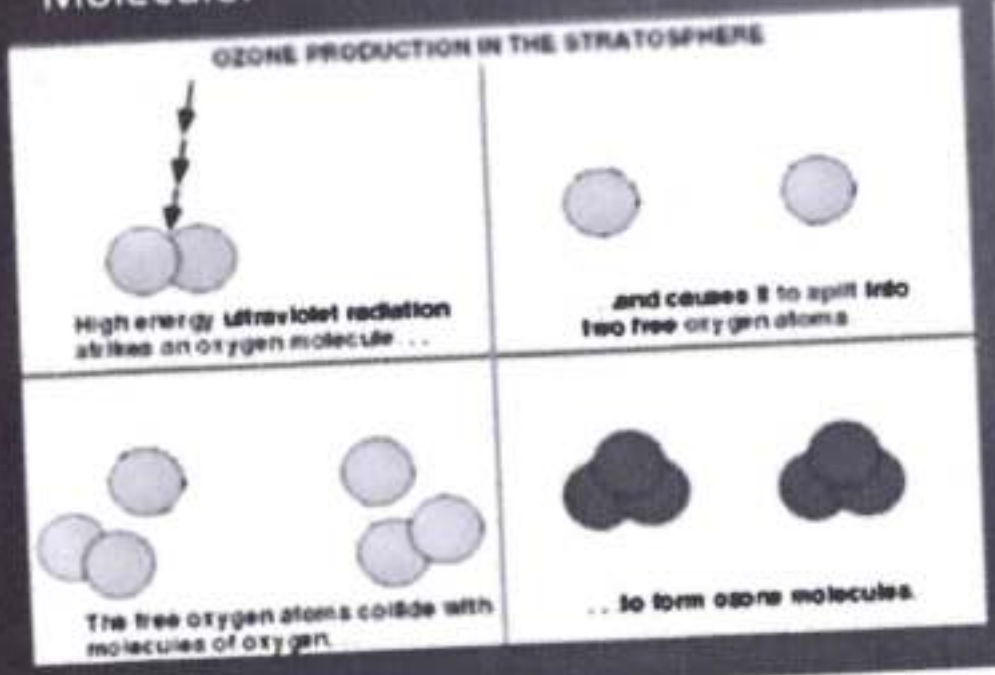
GOOD AND BAD OZONE

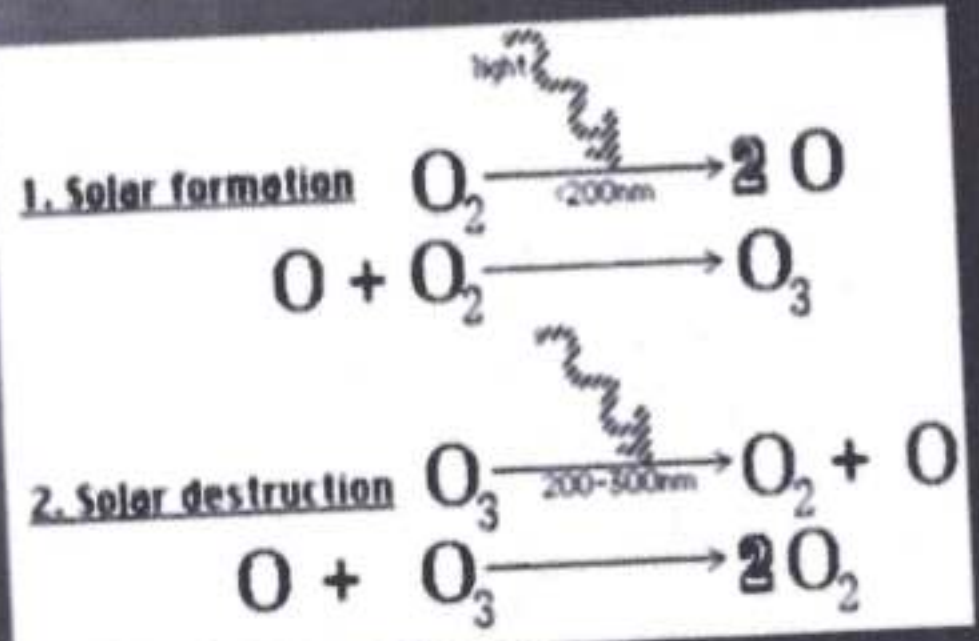
- The Ozone found at Stratosphere is a Good Ozone as it absorb the harmful UV rays of Sun
- The ozone found at Troposphere is a Bad Ozone as it is toxic and affects on the humans & plants.



OZONE FORMATION

- When an Oxygen molecule absorbs a Photon of Light with a wavelength shorter than 200 nanometers (1 Billion of meter) the energy splits the molecule into two Oxygen atoms. One of these atoms can react with another oxygen molecule to form an Ozone Molecule.





THE MEHTA GROUP

WHY OZONE LAYER IS IMPORTANT

HATHI CEMENT

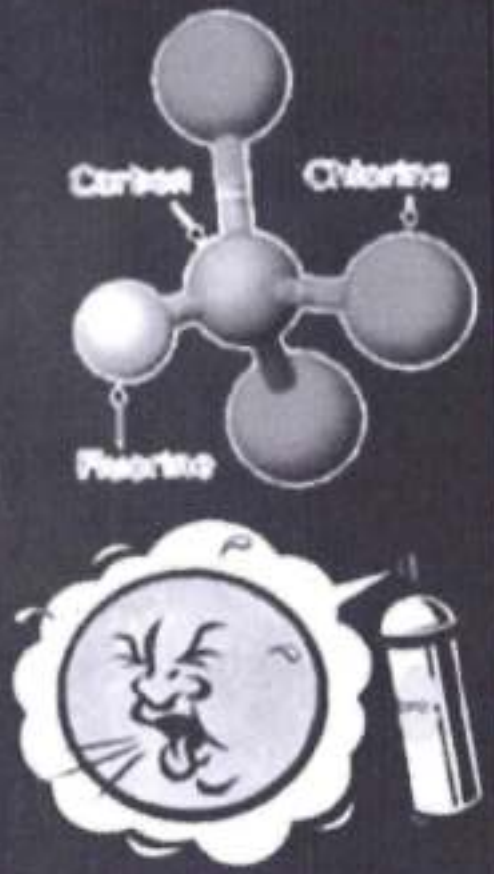
- The stratospheric ozone layer completely stops the penetration of UV-C rays and eliminates most of the UV-B rays.
- Therefore, the ozone layer protects life on Earth from the harmful effects of solar radiation on a daily basis.

THE MEHTA GROUP

OZONE LAYER DEPLETION

HATHI CEMENT

- Since 1928, Chlorofluorocarbons have been produced, originally as nonflammable refrigerants for use in refrigerators, and eventually for use in fire extinguishers, dry cleaning agents, pesticides, degreasers, adhesives, and as propellants for aerosol products.
- Choro fluro Carbon (CFCs) leak from equipment, get mixed in the atmosphere. CFCs are extremely stable, so they do not react with other substances in the atmosphere, It have an estimated lifespan of more than 100 years
- CFCs travel around for years, climb higher and higher, up to 10 km or So



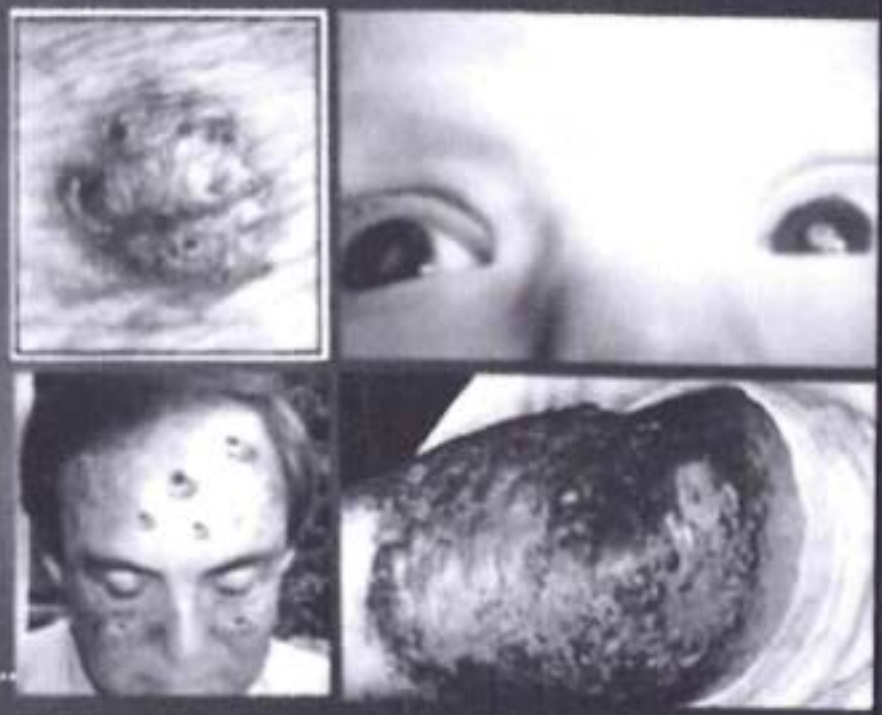

THE MEHTA GROUP
OZONE HOLE
HATHI CEMENT
100 150 200 250 300 350 400
Dobson Units
1979
1980
1981
2000
2002
2006
2012
2013
2014

THE MEHTA GROUP

DEPLETING THE OZONE LAYER MEANS :

HATHI CEMENT

- More UV-B radiation to reach the earth.
  - More UV-B means
    - More melanoma and non-melanoma skin cancers
    - More cancers
    - More eye cataracts
    - Weakened immune system
    - Reduced plant yields
    - Damage to ocean eco-system
    - Reduced fishing yields
    - Adverse effects on animals
    - More damage to plastic equipment & material etc...



Art's and Commerce College, Warwat Bakal

Tq-Sangrampur Dist- Buldana

Department of Chemistry

Certificate

This is to certify that Mr. /Ms Gayatri Narendra kalmegh

Class (Sem.) BSC-IIIrd Sem-VI Roll No. 39 Studying in the academic year 2022-23 of this institute has completed project assignment based on syllabus & given satisfactory account of it in this book.

Date:

24/4/23

Teacher in charge

HOD

I. INTRODUCTION

Nowadays, due to the decreasing amount of renewable energy resources, the last ten years become more important for per watt cost of solar energy device. It is definitely set to become economical in the coming years and growing as better technology in terms of both cost and applications. Everyday earth receives sunlight above (1366W approx.) This is an unlimited source of energy which is available at no cost. The major benefit of solar energy over other conventional power generators is that the sunlight can be directly converted into solar energy with the use of smallest photovoltaic (PV) solar cells. There have been a large amount of research activities to combine the Sun's energy process by developing solar cells/panels/module with high converting form. the most advantages of solar energy is that it is free reachable to common people and available in large quantities of supply compared to that of the price of various fossil fuels and oils in the past ten years. Moreover, solar energy requires considerably lower manpower expenses over conventional energy production technology.

II. SOLAR ENERGY

Amount of energy in the form of heat and radiations called solar energy. Shown in Fig.1. It is radiant light and heat from sun that is natural source of energy using a range of ever changing and developing of technology such as solar thermal energy, solar architecture, solar heating, molten salt power plant and artificial photosynthesis. The large magnitude of solar power available makes highly appealing source of electricity. 30% (approx.) solar radiation is back to space while the rest is absorbed by ocean, clouds and land masses.

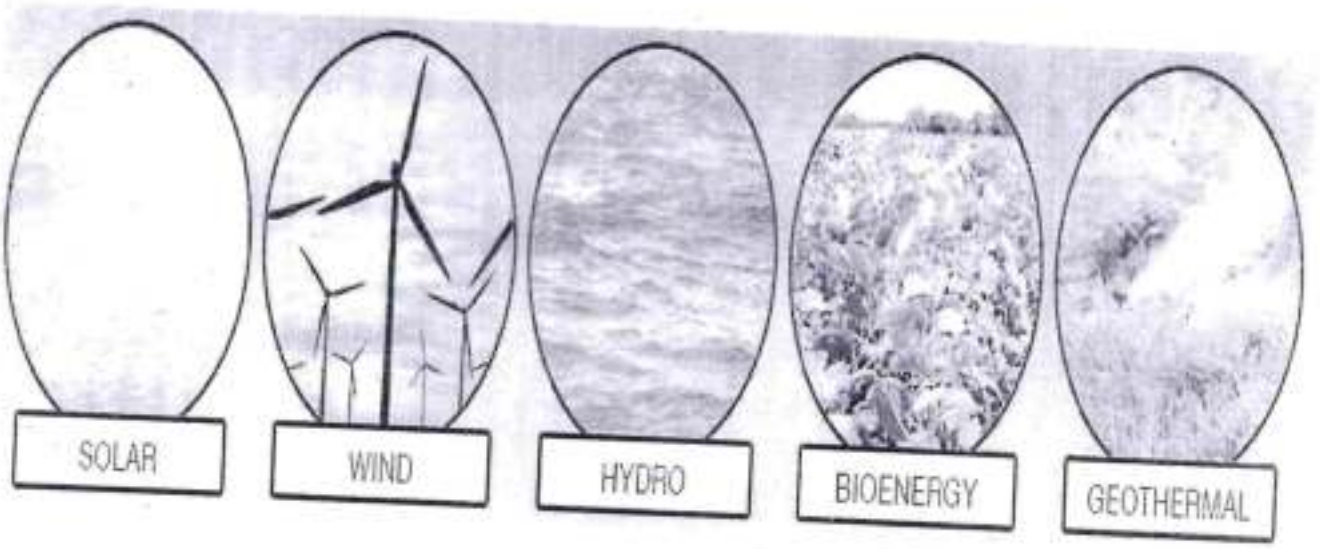
DEFINITION OF ENERGY

Energy: Energy is the ability to do work. The law of conservation of energy states that energy can be converted in form, but not created or destroyed. Two types of energy given blow

1. Renewable Energy
2. Non Renewable Energy

MAIN SOURCES OF RENEWABLE ENERGY

- Wind Energy.
- Biomass.
- Geothermal Energy.
- Hydropower.
- Solar Energy (Photo voltaic (PV) Cells).



ADVANTAGES AND DISADVANTAGES OF RENEWABLE ENERGY

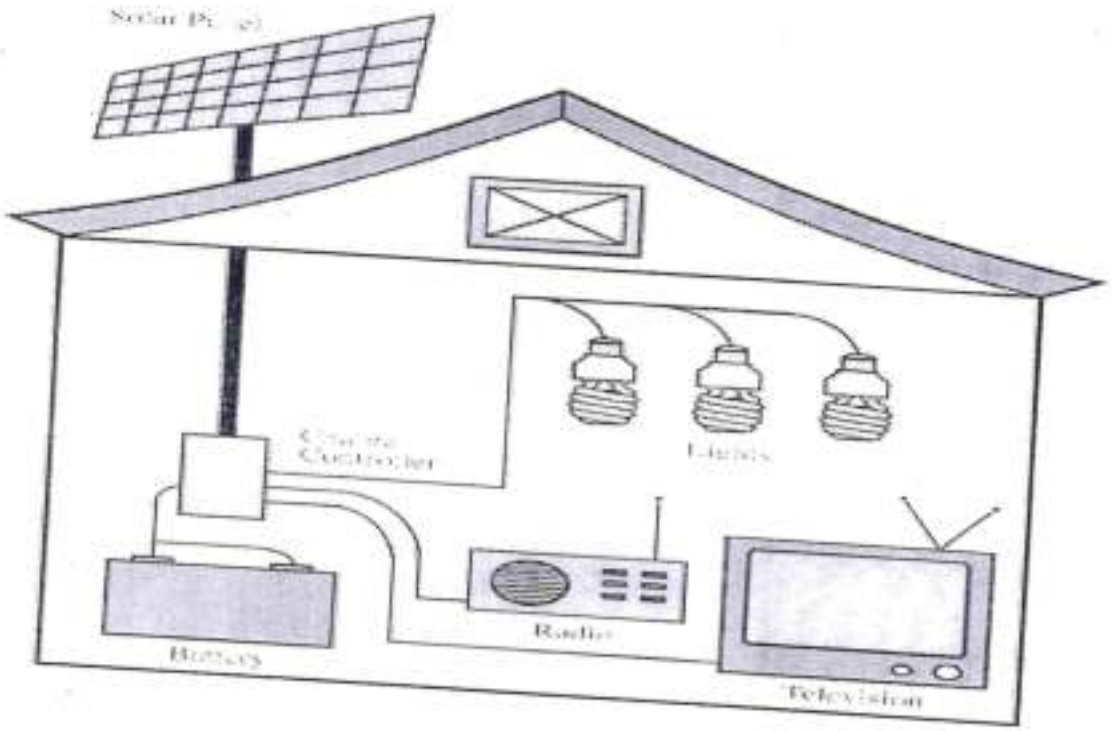
Advantages	Disadvantages
Easily Regenerated	Weather Dependency
Boost Economic Growth	High Installation Cost
Easily Available	Noise caused by Wind Energy
Support Environment	Fluctuation problem (Solar)
Low Maintenance Cost	Intermittency Issue (Wind)

Future Scope

A reliable, affordable and secure supply of energy is important for socio-economic development. As a country of acute power crisis Bangladesh is now looking forward to develop its renewable energy sources in addition to its traditional sources of fossil fuel. Solar energy is the most abundant renewable energy source of Bangladesh. Taking advantage of it we can enrich our regular life. In this paper we have tried to focus on the alternative uses of solar energy to ensure the energy security in near future. A solar based electric vehicle recharging station can reduce the fossil fuel consumption in transportation sector without using any power from grid and will keep our environment clean. A DC grid in off grid area based on solar PV can solve our irrigation problem as well as will ensure a better life for the rural people. Solar cooking can be a viable option for cooking both in rural and city area for reducing the natural gas consumption and burning of wood stock. So by ensuring these l prospects we can solve our energy and gas crisis; and ensure a green environment for the future generations.

Solar Home System (SHS)

The direct conversion of sunlight into electricity is called photovoltaic solar energy conversion. An essential component of Photo Voltaic (PV) system is the solar cell, in which the photovoltaic effect takes place. When light falls on the semiconductors of the cell, it produces a small electric current. Photovoltaic modules, or panels, consist of a number of cells connected together to provide voltages and currents high enough for practical use. More common in rural electrification programs is the use of solar PV as stand-alone systems in households, social institutions, or places of productive or business activities. Generally, the system is referred to as 'Solar Home System' (SHS). The SHS providing load is low ,but can be sufficient for powering of lights, radios, television sets, and to refrigerate medicines at rural clinics.



Limitations of the study

- During field work some limitations are encountered. These are:
- The village is located in a remote area, so the travel arrangements there are very bad.
- Most of the people there were illiterate; they could not answer our many questions correctly.
- At first, they were feeling helpless to talk to us. Because they have not been surveyed before.

Arts & Commerce College * Warvat Bakal *

Principal
Arts & Commerce College,
Warvat Bakal Dist.Buldana

Botany

Sant Gadge Baba Amravati University, Amravati

Satpuda Education Society, Jalgaon Jamod's

Arts Commerce College Warvat Bakal

Department of Botany

2022-2023

PROJECT ASSIGNMENT

Topic: Study of medicinal plant diversity local area.

Submitted by: Abhishek Pralhad Dhaye.

Class (SEM): BSc (Sem VI) 3rd Y

Date of submission: 28/04/2023.

Teacher Incharge

HOD 24/4/23

Project Submitted Students List
Botany
2022-23
Study of medicinal plant diversity in local area

Sr.No	Name Of Students
1.	Abhishek Pralhad Datar
2.	Abhishek Pralhad Dhage
3.	Ajay Gajanan Raut
4.	Ajit Shivshankar Tathod
5.	Aniket Vijay Date
6.	Ashwin Gajanan Tayde
7.	Atul Prakash Ingle
8.	Dnyanesh Gajanan Ghayal
9.	Gaurav Shahadeo Mhasal
10	Jivan Ramesh Hage

Introduction:

Turmeric (*Curcuma longa*) belongs to the family *Zingiberaceae* and might be one of the most valuable herbal medicinal plants.[1] Turmeric is also referred to as Indian saffron due to its brilliant yellow colour.[2] Turmeric contains a yellow pigment called curcumin or diferuloylmethane, which is the principal ingredient responsible for its properties.[1,3]

Turmeric is distributed throughout subtropical and tropical regions of the world. It is extensively cultivated in Asian countries, especially in China and India. It grows up to a height of one meter and has a short stem.[1]

Properties of Turmeric:

Turmeric might possess properties like:

- It might be an antioxidant
- It might help lower blood sugar levels (antidiabetic)
- It might be a hypolipidemic (cholesterol-lowering)
- It might help alleviate inflammation (anti-inflammatory)
- It might be effective against microorganisms (antimicrobial)
- It might have hepatoprotective (liver-protecting) properties
- It might have nephroprotective (kidney-protecting) properties
- It might act as an anticoagulant (inhibits blood clotting)[1]

Neem

This tree is known to all. Its leaves, fruits, as well as trunk are medicinal. Its leaves are used for skin diseases like eczema. Neem leaf oil is used to heal itches and wounds. Also, these leaves can be boiled and used. Neem is a great disinfectant and insecticide. A decoction of the outer part of its trunk is also a remedy for many diseases. Planting this tree and taking care of it is beneficial for us. Neem oil should be prepared by adding water of neem leaves to 100 ml. Extract fresh juice. It contains 25 ml. Add sesame oil. Cover and boil it on low flame. In about half an hour, part of the water is gone. Cool the remaining mixture and strain. This oil can easily last for a year if stored in a bottle with a tight lid. Applying this on the wound heals it quickly. To heal childbirth wounds, sit in a tub of hot water with lemon leaves for 15 minutes daily.

Tulasi plant

These studies reveal that tulsi has a unique combination of actions that include: Antimicrobial (including antibacterial, antiviral, antifungal, antiprotozoal, antimalarial, anthelmintic), mosquito repellent, anti-diarrheal, anti-oxidant, anti-cataract, anti-inflammatory, chemopreventive, radioprotective, hepato- ...

Tulsi has also been shown to counter metabolic stress through normalization of blood glucose, blood pressure and lipid levels, and psychological stress through positive effects on memory and cognitive function and through its anxiolytic and anti-depressant properties.

Research-Backed Benefits of Tulsi are:

- Natural Immunity Booster: ...
- Reduces Fever (antipyretic) & Pain(analgesic): ...
- Reduces Cold, Cough & Other Respiratory Disorders: ...
- Reduces Stress & Blood Pressure: ...
- Anti-cancer properties: ...
- Good for Heart Health: ...
- Good for Diabetes Patients: ...
- Useful in Kidney stones & Gouty Arthritis:

Adulsa

This shrub is used to cure cough. A decoction or juice of dulsa leaves is taken for cough. Juice is served with honey. Wash 50-60 adulsha leaves and boil them in one liter of water for half an hour on low flame. There should be about half a cup of water left. This extract should be cooled and filtered. 20 ml in case of cough. Take this amount 2 to 3 times a day for 3 days. This drawing is useful for small noble persons. There is no need for other cough bottles at this time.

Arts & Commerce College Warvat Bakal

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Arts & Commerce College,
Warvat Bakal Dist. Buldana

Zoology

"Survey the Diversity of Snakes in the Surrounding Area"

Skill Enhancement Module

SUBMITTED

To

Sant Gadge Baba Amravati University, Amravati

In fulfillment of Internal Assessment of B. Sc. I Semester II

Submitted by

Aniket Subhash Wankhade

Department of Zoology

Arts & Commerce College Warwat Bakal. Sangrampur

Dist. Buldhana

2022-2023

Arts & Commerce College, Warwat Bakal Tah. Sagrampur

Dist. Buldhana

-:CERTIFICATE:-

This is to certify that the skill enhancement module entitled **"Survey the Diversity of Snakes in the Surrounding Area"** for the fulfillment of internal assessment is a personally completed work carried out by Mr. **Aniket Subhash Wankhade** from B. SC. I. Semester II at Department of Zoology, Arts & Commerce College Warwat Bakal.

Place: Warwat Bakal.

Date: 20/04/2023

Internal Examine

Mr. S. D. Deshmukh

27/3/23

Head of Department

Dr.M.R.Solanke.
Assistant Professor &
Head of Zoology Department
Arts,Commerce College,Warwat (Bk.)
Tq.Sangrampur Dist:Buldhana 444202

"Survey the Diversity of Snakes in the Surrounding Area"

Introduction:

Snakes are elongated, legless reptiles that belong to the suborder Serpentes. They are found all over the world, except for Antarctica, and have evolved a unique set of adaptations that enable them to move and hunt in a variety of environments.There are over 3,500 species of snakes, ranging in size from tiny thread snakes that measure only a few inches long to the reticulated python, which can grow up to 30 feet in length. They come in a wide range of colors and patterns, from brightly colored coral snakes to the cryptic camouflage of many species of vipers and pit vipers.Snakes are carnivorous and feed on a variety of prey, including insects, rodents, birds, and other snakes. Some snake species are venomous, and their venom can be used for hunting or for self-defense. However, the vast majorities of snake species are non-venomous and pose no threat to humans.Snakes play an important role in many ecosystems, helping to control populations of prey species and serving as prey for larger predators. They are also an important subject of scientific research, with scientists studying their behavior, physiology, and genetics to better understand the natural world.While snakes are often feared and misunderstood, they are an important and fascinating group of animals that play an important role in the health and balance of many ecosystems.India is home to a diverse array of snake species, including over 300 different types of snakes. Some of the most well-known Indian snakes include venomous species such as the Indian cobra, Russell's viper, common krait, and saw-scaled viper, as well as non-venomous species such as the Indian rock python, Indian python, and Indian rat snake. Many of these snakes are important predators in their respective ecosystems, helping to control populations of rodents and other pests. However, some of these species can also pose a threat to humans, with snakebite being a common problem in many parts of the country. Conservation efforts are important for protecting the diverse snake populations in India, as habitat loss and human persecution pose a threat to many of these species.

Taxonomy of snakes:

Kingdom: Animalia (animals)

Phylum: Chordata (vertebrates)

Class: Reptilia (reptiles)

Order: Squamata (scaled reptiles)

Suborder: Serpentes (snakes)

The suborder Serpentes is further divided into two infraorders:

Alethinophidia (advanced snakes): This group includes most of the world's snakes, including cobras, vipers, pythons, and boas.

Scolecophidia (primitive snakes): This group includes a small number of species that have retained some primitive features, such as a reduced number of vertebrae and small, simple teeth.Within the infraorderAlethinophidia, there are several families, such as Colubridae, Elapidae, Viperidae, and Boidae. Each family contains several genera, and each genus contains one or more species of snake. There are over 3,500 species of snakes, and their taxonomy is constantly evolving as new species are discovered and studied.India is a country known for its rich biodiversity and is home to a vast array of animal and plant species, including many species of snakes.

India has a diverse range of habitats, from deserts to tropical forests, which provide ideal conditions for a wide variety of snake species.Indian cobra (Najanaja): One of the most well-known snakes in India, the Indian cobra is found in many parts of the country, especially in agricultural areas.Russell's viper (Daboiarusselii): Another venomous snake found in India, the Russell's viper is responsible for many snakebite deaths each year.Common krait (Bungaruscaeruleus): The common krait is a highly venomous snake that is found throughout India. It is responsible for many deaths due to snakebite.Indian rock python (Python molurus): The Indian rock python is one of the largest snakes in the world and can be found in many parts of India, especially in forested areas.Rat snake (Ptyas mucosa): The rat snake is a non-venomous snake found in many parts of India. It is commonly found in agricultural areas where it feeds on rats and other small rodents.Indian sand boa (Eryxjohnii): The Indian sand boa is a small, non-

venomous snake that is found in many parts of India. It is commonly found in arid regions and is a popular pet.Spectacled cobra (Najanaja): The spectacled cobra is another venomous snake found in India. It is similar in appearance to the Indian cobra but has distinctive markings on its hood.

Snake diversity is important for several reasons:

Ecological balance: Snakes play an important role in maintaining ecological balance in their respective ecosystems. They help control the populations of small mammals and other prey species, thereby preventing overgrazing and other negative impacts on vegetation.

Pest control: Many snake species feed on pests such as rats, mice, and insects. In agricultural areas, snakes can help control pest populations and reduce the need for chemical pesticides.

Medicinal value: Some snake species have been used in traditional medicine for centuries. For example, the venom of some snake species is used to produce antivenom, which can be life-saving for people who are bitten by venomous snakes.

Scientific research: Snakes are an important subject of scientific research, and studying their behavior, physiology, and genetics can help us better understand the natural world and develop new medical treatments and technologies.

Cultural significance: Snakes have been an important part of human culture and mythology for thousands of years. They feature in many religious and cultural traditions and are often viewed as symbols of wisdom, transformation, and rebirth.

Unfortunately, snakes face several threats to their survival, including:

Habitat loss and fragmentation: Many snake species are losing their natural habitats due to deforestation, urbanization, and other human activities. This loss of habitat can lead to reduced food availability, increased competition, and higher mortality rates.

Climate change: Changing temperatures and weather patterns can affect snake behavior, reproductive success, and food availability. This can have significant impacts on snake populations and their ability to survive and thrive.

Overhunting and poaching: Some snake species are hunted for their skins, meat, and other body parts. This can lead to population declines and, in some cases, local extinctions.

Road mortality: Snakes are often killed by cars and other vehicles while crossing roads. This can have significant impacts on local populations, especially in areas where roads bisect important habitats.

Illegal trade: Many snake species are illegally traded as exotic pets, for their skins, and for use in traditional medicines. This trade can contribute to declines in wild populations and can also spread diseases and parasites.

Methods:

To study the diversity of snakes in the surrounding area the two very common methods were utilized.

1. Literature survey

2. Personal interviews with local peoples

The various books and handbooks were also studied to understand variety of aspects related with snakes.

Study findings

The surrounding is mostly occupied by agricultural fields and some of the area is occupied by semi forest. The prevalence of snakes in the local area is predominant due the favorable climatic condition and landscape.

The following species of snakes were encountered frequently in the local area,

Sr. no	Name of the Species	Photograph
1	Ptyas mucosa Common name: Common rat snake (Dhaman) **FEATURES**: Dark brown, black or tan with faint vertical banding from head to mid section and black or grey checkering towards the tail ~ 1.5-2 meters when mature **VENOM**: None	

2	Coelognathus helena Helena Common name: Taskar Head narrow, elongate and well defined; neck slightly distinct; pupil round; snout small and rounded; dorsal scales smooth; ventral scales with weakly developed keels; nostrils large. Dorsum brownish with reticulated pattern of dark brown or black markings containing white ocellii. The patterns are most conspicuous towards anterior side and gradually disappearing towards the posterior part of the body and transformed to two dark lateral stripes; behind the head there are two short narrow black lines on the lateral sides extending beyond the neck; belly pure white. *SVL: 1500mm*	
3	Oligodon arnensis Common Name: Kukri Common Kukri is the most widely distributed Kukri Snake (genus Oligodon) found in wide range of forests and lands. Can be identified easily by checking brown dorsal, blackish bands and black arrow shaped markings on head. **Non Venomous**	

4	Daboia russelii Common Name: Ghonas The dorsal scales are strongly keeled; only the lower row is smooth. Mid-body, the dorsal scales number 27–33. The ventral scales number 153–180. The anal plate is not divided. The tail is short — about 14% of the total body length — with the paired subcaudals numbering 41–68. **Venomous**	
5	Naja naja Common Name : Naag A Naja naja can be easily identified by the presnce of hood and the sepectle mark on the back of the hood. The hood is spread only when the snake is aggitated, and in some specimens the hood marks are absent too. Body slender with smooth oval shaped scales. Dorsal color includes yellow, all shades of brown, grey, reddish, black or black mixed with blue, purple, red etc. Side dorsal scales are larger and clearly oval shaped while scales on the top are narrow and become pointed. Color greatly depends on geographical region. Maharashtra, whole South India, Andhra Pradesh, Orissa, West Bengal etc. coastal states population bear color range of yellow and brown. Sometimes dark color obtuse bands are also found on posterior body. While Central, northern & Western India population is known for dark brown or black color.	

Reference

P. S. Joshi (2011): A preliminary survey on the snakes of Buldhana district, Maharashtra Article in *Golden Research Thoughts* Vol.1,Issue.II.

https://indiabiodiversity.org/species/show/238905

Principal
Arts & Commerce College,
Warvat Bakal Dist.Buldana

Commerce

SANT GADGE BABA AMRAVATI UNIVERSITY, AMRAVATI

Arts & Commerce College, Warwat Bakal, Dist.Buldana

PROJECT REPORT FOR

B.COM. PART III SEMESTER V

"A Project Report E - Banking"

PRSENTED BY

PALLAVI RAVINDRA AVCHAR

STUDENT

B.COM III SEMESTER V

YEAR : 2022-2023

Guide	HOD	Principal
Prof. Dr. S. J. Tale	Prof. Dr. S. W. Rane	Dr. R. S. KORDE
M.Com, MBA, PhD., NET.	M.Com, M.Phil., PhD.,NET.	M.A., PhD.,

DECLARATION

I hereby declare that this Project entitled, **"A Project Report E - Banking"** has been prepared by me during the academic year 2022-23 under the guidance of Prof. Dr.S.J.Tale Commerce faculty of ***Arts & Commerce College, Warvat Bakal, Dist. Buldana***.

I also hereby declared that this work has not been previously submitted to any other university for any examination.

Date: 15 / 10 /2022

Place: Warwat Bakal

Student Signature

Name:- PALLAVI RAVINDRA AVCHAR

ARTS, COMMERCE & SCIENCE COLLEGE, WARWAT BAKAL

Department of Commerce

CERTIFICATE

This is to certify that, **PALLAVI RAVINDRA AVCHAR**

Student of B.Com., part III semester V of ***Arts & Commerce College, Warwat Bakal, Dist. Buldana***. Completed her/his project report on the subject, **"A Project Report E - Banking"** Under my supervision of guidance in the academic session 2022-23. Project is the result of the candidate's own research and is of sufficiently high standard. Wishing her/his a bright success.

Guide	HOD	Principal
Prof. Dr. S. J. Tale	**Prof. Dr. S. W. Rane**	**Dr. R. S. KORDE**
M.Com, MBA, PhD., NET.	**M.Com, M.Phil., PhD.,NET.**	**M.A., PhD.,**

Place: Warwat Bakal

Date: 15 / 10 /2022

ACKNOWLEDGEMENT

I express my sincere thanks to **Dr. KORDE, Principal** of ***Arts & Commerce College, Warvat Bakal, Dist. Buldana,*** for his valuable suggestion and support to prepare this report.

I wish to take this opportunity to express my special thanks of gratitude to **Prof. Dr. S. W. Rane HOD of Commerce Department** and my deep sense of gratitude to **Prof. Dr. S. J. Tale Project Guide**, of ***Arts & Commerce College, Warvat Bakal, Dist. Buldana***, for their able guidance and support in completeing my project.

Finally, it is my foremost duties to thank all who have help me to complete my project without which this project would not have been possible.

Date: 15 / 10 /2022

Place: Warwat Bakal

Student Signature

Name:- PALLAVI RAVINDRA AVCHAR

अनुक्रमिनका

प्रस्तावना –

जेव्हा बँक सेवा पुरवण्याच्या व्यवस्थित माहिती तंत्रज्ञानाची आधुनिक साधने वापरली जातात. तेव्हा त्यास ई - बँकिंग असे म्हणतात.

बँकच्या खात्याची चौकशी करणे पैसा भरणे पैसा काढणे रकमेची हस्तारण करणे. या सारखे व्यवहार ई – बँकिंगमुळे तत्परतेने पार पाडतात. ई – बँकिंगमुळे प्रत्येक वेळी ग्राहकांना बँकेत जाण्याची गरज पडत नाही. ई – बँकिंगचे वैशिष्टे , कार्ये , महत्त्व , उदिष्टे स्पष्ट करता येतात. बँक एक संस्था आहे. बँक जनते कडून धन जमा करते. हे एक बँक प्राथमिक कार्य करत आहे.परंतु एकमात्र नाही. आपल्या ग्राहकांना अनेक अन्य सेवा देखील प्रधान करते.

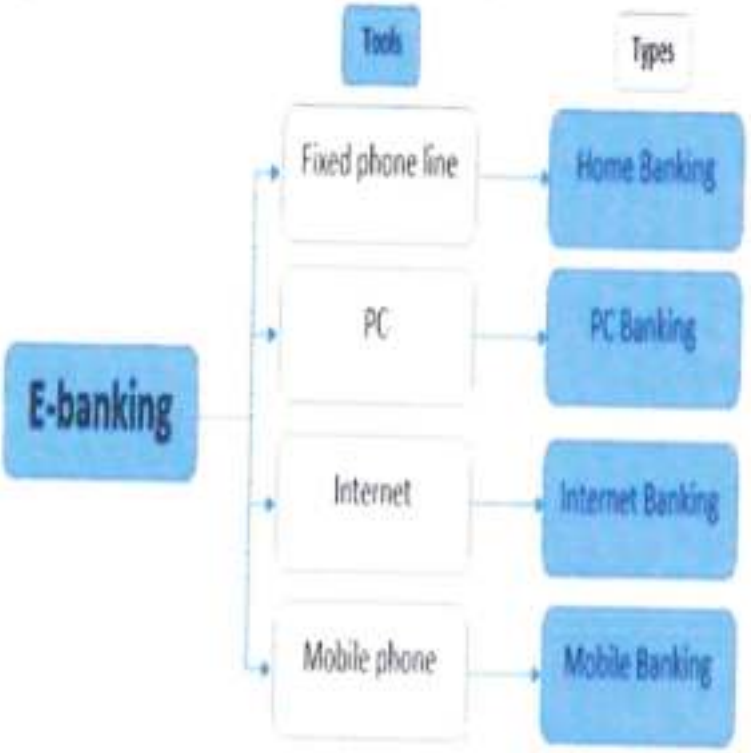
तुम्ही इंटरनेट वर किंवा घरातल्या मोठ्या माणसांकडून तसेच बँकेमध्ये E-Banking बद्दल नक्की ऐकले असेल. पण **इ- बँकिंग म्हणजे काय?**

इंटरनेट आल्यापासून सर्व गोष्टी ऑनलाईन आणि जलद होते आहेत. त्यामुळे कोणतेही काम एका जागेवरून होत आहे. त्यामुळे भारत सरकारने 1 जुलै 2015 ला डिजिटल इंडिया मोहिमेच्या अंतर्गत संपूर्ण भारतात सगळं डिजिटल करण्याची प्रक्रिया सुरू केली. ह्या डिजिटल इंडिया मोहिमेमध्ये 9 मुख्य Pillers आहेत. Broadband Highways, Public Internet Access इत्यादी. ह्यांच्या मार्फत भारत देशात संपूर्ण ठिकाणी सर्व डिजिटल आणि ऑनलाईन होणार आहे. त्याचंच निमित्त साधून बँकेतील सर्व सेवा ऑनलाईन करण्यात आल्या. माणूस एका जागेवरून फक्त एका क्लिक वर बँकेतील सर्व सेवा ऑनलाईन वापरू शकतो. त्यामुळे बँकेत न जाता घरबसल्या इंटरनेट बँकिंगचा वापर आपण करू शकतो.

इ- बँकिंग म्हणजे "इलेक्ट्रॉनिक बँकिंग"होय. इलेक्ट्रॉनिक माध्यमांचा वापर करून केला जाणारा बँक व्यवसाय म्हणजे इ- बँकिंग होय. जेव्हा बँक सेवा पुरवण्याच्या व्यवस्थेत माहिती तंत्रज्ञानाची अत्याधुनिक साधने वापरली जातात तेव्हा त्यास इ- बँकिंग असे म्हणतात. खात्याची चौकशी करणे, पैसे भरणे, पैसे काढणे, रकमेचे हस्तांतरण करणे यासारखे व्यवहार इ- बँकिंगमुळे

तत्परतेने पार पडतात. इ- बँकिंगमुळे प्रत्येक वेळी ग्राहकांना बँकेत जाण्याची गरज पडत नाही. संगणकाद्वारे ग्राहक घरातून किंवा कचेरीतून व्यवहार करू शकतात.

ई बँकिंग मध्ये तुमची बँक तुम्हाला असे अधिकार देते ज्यात तुम्ही घरी बसल्या बँकेचे व्यवहार करू शकतात जसे बँक खतेची तपशील करणे, किती रक्कम आहे ते जाणून घेणे, मागील काही व्यवहार बघू शकतात, ऑनलाईन पैशांचे देवाण घेवाण करू शकता आणि इतर अनेक कामे जलद गतीने आणि कमी वेळेत करू शकतात.



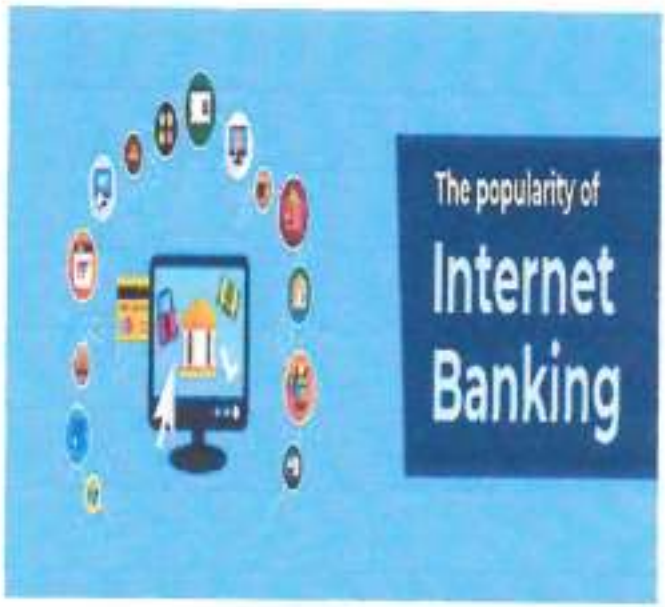
व्याख्या आणि अर्थ :-

"घरबसल्या इलेक्ट्रॉनिक व इंटरनेट माध्यमातून बँकिंग सेवा उपलब्द करून घेण्याला ई – बँकिंग म्हणतात. यामध्ये घरबसल्या रकमेचे शोधन करणे. रकमेचे स्थानांतरण करणे. खात्याचे विवरण प्राप्त करणे. खात्यांचे संशोधन करून घेणे. इत्यादी कार्ये केली जातात. थोडक्यात वर्ल्ड वाईबवेबच्या माध्यमातून बँकिंग कार्ये करणे म्हणजे ई –बँकिंग होय. आपल्या घरचा संगणक इंटरनेटच्या माध्यामातून बँकांना जोडला म्हणजे बँक ग्राहकाला आपल्या बँकेशी बँकेच्या संबंधीचे व्यवहार करता येतात. त्यासाठी बँकेत जाण्याची गरज नसते."

"बँक म्हणजे अशी संस्था कि जी आपल्या सामान्य व्यवहारात पैसे स्वीकारते आणि ज्यांच्याकडून किंवा ज्यांच्या खात्यावर पैसा जमा होत असतील. त्यांचे चेक्स स्वीकारून पैशाची परतफेड करते."

" पैसा आणि पतपेसचे व्यवहार करणाऱ्या संस्थेला बँक असे म्हणतात."

ई – बँकिंग हि एक प्रणाली आहे. जी इंटरनेट आणि दूरसंचार नेटवर्क वापरणार्या ग्राहकांना विविध ऑनलाईन बँकिंग असे म्हणतात.



ई बँकिंगचे वैशिष्ट :-

1) घरबसल्या बँकिंग –

ग्राहकाला बँकेत जाण्याची रांगेत उभे राहण्याची गरज न पडता बँकिंग करता येते. हे सर्वात मोठे वैशिष्ट होय. याशिवाय बकेला आपल्या ग्राहकांच्या खात्यामध्ये जे काही व्यवहार करायचे असतात. ते बँक करून ग्राहकाला कळवू शकतात. यामुळे बँकेच्या संदेशवाहनाच्या खर्चात मोठी बचत घडून येते.

2) सर्वत्र बँकिंग सर्व काळ बँकिंग :-

ई – बँकिंगचे हे वैशिष्ट फारच महत्त्वाचे आहे. ई – बँकिंगला / स्थान यांची मर्यादा नसते. त्यामुळे सेवा केव्हाही आणि कुठेही उपलब्द असतात. याचा खूपच लाभ सर्वसामान्य ग्राहकाला मिळतो.

3) खरेदी सुलभ :-

ऑनलाईन खरेदीतून ग्राहकांचे पैसे वाचतात असे दिसून आले. मोठमोठ्या बहुराष्ट्रीय कंपन्या मोठ्या प्रमाणात छोट्या कंपनीतून माल खरेदी करून मोठी सुट मिळवतात. या लाभतील काही लाभ उपभोक्त्याला देखील प्रचार व प्रसार केला जातो. शिवाय हि पद्धत सोपी , जलद व विश्वासू करण्यावर भर दिला जातो.

4) मानवी हस्तक्षेप टळतो. :-

यंत्राचे किंवा तंत्रज्ञानाचे वैशिष्टे असे कि ते सांगितलेले कार्य पार पडतो. मानवी कार्यात स्वार्थ , आळस, लोभ इत्यादी. अवगुण येतात. यंत्रणामुळे हे काम बिनबोभाटपणे प्रणामानिकपणे होत असल्यामुळे मानवी हस्तक्षेप टळतो.

5) सोयीस्कर बँकिंग :-

ई – बँकिंगमुळे ग्राहकाला सोयीस्कररीत्या पैशाच्या लाभ घेता येणे शक्य झाले आहे. त्यांना शाखेत हेलपाटे घालावे लागत नाही.

6) रोख रक्कमेची जोखीम टळली :-

ई – बँकिंग सर्वत्र आणि सदैव उपलब्द असल्यामुळे जवळ रोख रक्कम बाळगन्याची गरज उरली नाही.

ऑनलाईन सुविधा बिलांच्या रकमा भरण्याची सेवा :-

नव्या काळातील माहिती - तंत्रज्ञानाच्या पायाभूत सुविधांवर भर देत बँकेने ऑनलाईन ब-याच सुविधा बिलांच्या रकमा भरण्याची सेवा सुरु करुन सगळ्याच खातेधारकांना देण्यात येणा - या सोयींमध्ये अधिक नावीन्य आणले आहे . आपली बिले आपल्या डेस्कटॉपपर्यंत आणत अनेक बँकांनी सगळीच कार्यपध्दती सोपी आणि सोयिस्कर केली आहे . आपली टेलिफोन , मोबाईल , ईलेक्ट्रीसिटी , इन्शुरन्स आणि इतर बिले ईलेक्ट्रीसिटी अनेक पध्दतीने बँकेच्या इंटरनेट बँकींग वेबसाईटवरुन भरता येतात . आता बिले भरण्याच्या रांगेत उभे राहण्याची किंवा वेगवेगळ्या कलेक्शन काऊंटर बॉक्सपर्यंत जाण्याची आवश्यकता नसते . आपली बिले आपण केव्हाही , कुठूनही , अगदी सुट्टीवर असतानाही आपल्याला भरता येईल.

ऑनलाईन सुविधा बिलांच्या रकमा भरण्याची सेवा या सेवेचा लाभ कोण घेऊ शकते :-

नेटबँकिंग सेवा , बरोबर इंटरनेट बँकींग खाते असलेली कोणतीही व्यक्ती या सेवेचा लाभ विनाशुल्क घेऊ शकते.

या सेवेची कार्यपध्दती कशी असते ?

ऑनलाईन ऍक्सेस - कोणत्याही दिवशी , कोणत्याही वेळी , कुठेही . ही सेवा वर्षभर 365 दिवस दिवसभर चोवीस तास उपलब्ध असते . आपल्या बिलांच्या

रकमा भरण्यासाठी फक्त आपल्याला इंटरनेटशी ऍक्सेस साधण्याची आवश्यकता असते .

नव्या बँक खात्याची आवश्यकता नसते :

सध्याच्या बँक खात्यांव्दारे आपल्याला बिले भरता येतात . या सेवेचा लाभ घेण्यासाठी क्रेडीट / डेबिट कार्डची आवश्यकता नसते .

अन्य व्यक्तींची बिले : आपले पती / पत्नी , मुले इत्यादींची बिलेही भरता येतात .

व्यवहारामधील खाजगीपणा : सर्व व्यवहार पूर्णपणे गुप्त असतात.

इंटरनेटवरील व्यवहारांमधील सुरक्षितता : प्रत्येक बँकेची वेबसाईट एसएसएलने सुरक्षित साईट म्हणून प्रमाणित केली आहे आणि ती पासवर्डने संरक्षित आहे.

बिल आणि रकमेचे पेमेंट : बिले देणा - या कंपन्यांच्या अटी आणि नियमांप्रमाणे आपल्याला बिलांच्या रकमा भरता येतील . संबंधित कंपनीच्या बाबतीत काही प्रश्न असेल तर कृपया सध्या जसे आपण करता तसेच त्या कंपनीशी थेट संपर्क साधा.

विशेष लाभ : आपले बिल ऑनलाईन भरा आणि विशेष लाभांचा फायदा घ्या . तपशिलांसाठी कृपया संबंधित बँकांची वेबसाईट पहा.

ई – बँकिंगचे फायदे :-

1) ई बैंकिंग चा सर्वात मोठा फायदा म्हणजे बँकेत न जाता घरी बसून फक्त मोबाईल किंवा कॉम्प्युटर च्या मदतीने कामे करू शकतात जसे बँक खात्याची शिल्लक रक्कम बघणे , पैसे ट्रान्स्फर करणे आणि इतर काही गोष्टी करू शकतात.

2) सुट्टीच्या दिवशीही आपण बँकेचा कारभार पाहू शकता , करू शकता आणि जर आपल्या पैसे पाठवायचे असतील किंवा प्राप्त करायचे असतील तर तेही करू शकतात.

3) इंटरनेट बँकिंग च्या मदतीने तुम्ही कुठूनही आणि कुठेही शॉपिंग चे बिल पे करू शकता , मोबाईल रिचार्ज करू शकता , बीज बिल भरू शकता , ऑनलाईन फॉर्म फी भरू शकतात.

4) आपण आपला बँक बॅलन्स ऑनलाईन चेक करू शकतात ज्याने आपले बँकेत जाण्याचे काम कमी होईल आणि तेही कमी वेळात तपासू शकतात.

5) नेट बँकिंग च्या साह्याने आपण बँकेत न जाता ऑनलाईन passbook , checkbook , debit card , credit card साठी सहजतेने apply करू शकता.

6) मागील जुने bank transition म्हणजेच पैशांचा व्यवहार (bank statement) आपण नेट बँकिंग च्या मदतीने तपासू शकता आणि pdf फॉर्म मध्ये डाऊनलोड करू शकतात.

7) याच्या साह्याने आपण FD , RD सारखे खाते उघडू शकतात ज्यात आपण पैसे जमवू शकतात . आणि ह्या खात्यात आपोआप आपली रक्कम आपल्या मुख्य खात्यातून कापून टाकली जाते हा ही एक मोठा फायदा आहे.

8) दिवस हो रात्र हो तरीही आपण बँकेचे व्यवहार करू शकता , बँक बॅलन्स चेक करू शकता , मित्राला पैसे पाठवू शकता , पैसे स्वीकारू शकता.

9) जर आपल्याला काही अडचण आली तर ती आपण ऑनलाईन तक्रार करून सोडवू शकतात आणि आपल्या समस्यांचे निवारण करू शकतात .

10) ई – बँकिंगमुळे बँकेशी करावयाचा दैनंदिन व्यवहार सुलभ होतो. बँकेचा ग्राहक आपल्या बँकेशी दिवसातून केव्हाही व कितीही वेळा व्यवहार करु शकतो.

11) ई – बँकिंग या तंत्रज्ञानाचा स्वीकार केल्यामुळे बँकेच्या संचालकाचा खर्च कमी होतो. स्टेशनरिचा खर्च वाचतो. पर्यायाने खर्चात घट होऊन नफ्यात वाढ होतो.

12) ई – बँकिंग तंत्रज्ञानामुळे बँकेच्या कार्यालयीन कामात खूप घट झाली. दस्तावेज तसेच लेख पुस्तके , विशेष पुस्तके आता बँकेला ठेवण्याची गरज नाही. सर्व व्यवहार संगणकामार्फत केला जात असल्यामले ते संगणकात साठवून ठेवले जातात.

13) सर्व कामे संगणकामार्फत होत असल्यामुळे पूर्वी इतके कर्मचारी लागत नाही. त्यामुळे कर्मचाऱ्यावरील खर्चात घट झाली.

14) ई – बँक मधिल सर्व मुलभूत कामे संगणकात करण्यात येत असल्यामुळे कार्यातील शितीलथा कमीत कमी होऊन कमीत कमी वेळात फक्त कि बोर्डच्या क्लिकने सर्व कामे तत्काळ विनाविलंब ग्राहकाचे केली जाऊ शकतात. अर्थात ग्राहकाच्या व बँकेच्या वेळेची बचत झाली.

15) सुविधा – आपल्याला वेळोवेळी बँकेत जावे लागत नाही. त्यामुळे पैसा आणि वेळेची मोठ्याप्रमाणावर बचत होते. आपल्या बँक खात्यावर व्यवहार इंटरनेटच्या सहय्याने आपण संगणकावर बघू शकतो. खात्यातील शिल्लक व्यवहार माहिती होते.

16) आपल्या घरी किंवा कार्यालयात बसून संगणक आणि इंटरनेटच्या माध्यमाने बँकेचा ग्राहक आपल्या बँकेचा व्यवहार करु शकतो.

17) ई – बँकिंगमुळे ग्राहकांचे समाधान होते. ग्राहकांच्या संखेत वाढ होते. बँकेच्या एकुण नफ्यात वाढ होते.

ई – बँकीगचे तोटे :-

* ई बँकिंगची सुरक्षा मजबूत असतेच परंतु आपल्या स्वतःच्या नेट बँकिंग अकाउंटला सुरक्षित ठेवणे आपलीही जबाबदारी आहे . जर आपली लॉगिन इन्फॉर्मेशन कोणत्या चुकीच्या व्यक्तीला माहीत पडली तर भारी नुकसान होऊ शकते . आपली रक्कम ही चोरली जाऊ शकते त्यामुळे आपण सतर्क राहिले पाहिजे.

* नेट बँकिंग कधीही सायबर , इतर कोणाच्या मोबाईल किंवा कॉम्प्युटर वर चालवू नये कारण येथे आपले अकाउंट हॅक होण्याची संभावना असते.

* काही वेळेस नेट बँकिंग सफल होत नाही म्हणजेच आपले ट्रांसिशन फेल होते त्यामुळे आपल्या कामात अडचण निर्माण होते . काही वेळेस आपले इंटरनेट कनेक्शन कमजोर असल्यामुळे आपला व्यवहार पूर्ण होत नाही.

* ग्राहक आणि बँकेतील संपर्क चांगला होत नाही , जर ग्राहकाला काही मोठी अडचण आली तर ती ऑनलाईन सोडवणे कठीण होते ज्यामुळे त्याला बँकेत जावे लागते.

1) महागडी यंत्रणा :-

ई – बँकिगसाठी मोठ्या प्रमाणावर खर्च करावा लागतो. उदाहरणार्थ . महागडी यंत्रणा खर्चिक असून त्यांचा देखरेखीसाठी मोठ्या प्रमाणावर खर्च करावा लागतो.

2) नेटवर्क समस्या :-

तुमचा महत्त्वाचा दोष म्हणजे नेटवर्क डाउन असणाऱ्या व्यक्तींना बँकेच्या व्यवहारात अळथडे निर्माण होतात. त्यामुळे अनेक समस्यांना तोंड द्यावे लागते.

3) सायबर गुन्हे :-

सिमेंटने आधुनिक तंत्र सुरक्षितता वाढविण्याचे दृष्टीने येणारे आहे. त्यातील सायबर गुन्हे सुद्धा मोठ्या प्रमाणावर वाढत आहे. हि बँकिंग बाबत असुरक्षितता निर्माण होताना दिसतात.

4) विशिष्ट वर्गाला लाभ :-

इंटरनेट सुविधेचा लाभ गरजेचा आहे. या सुविधेचा लाभ सुशिक्षितांना मोठ्या प्रमाणात होताना दिसतो.

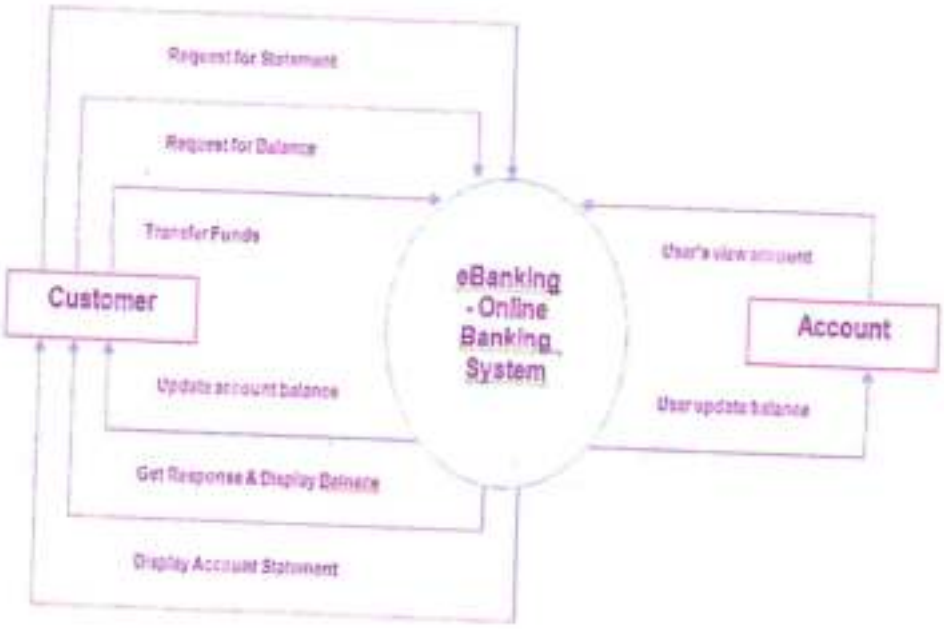
SBI बँकेचा अर्थ – व्याख्या :-

भारतीय स्टेट बँक हि भारतातील सर्वात मोठी बँक आहे. सन 1929 मध्ये स्थापना झालेल्या इम्पिरियल बँक ऑफ इंडियाचे नाव बदलून स्टेट बँक ऑफ इंडिया झाले. भाग भांडवल आणि गंगाजळी याचा विचार करता जगातील सर्वात मोठ्या 100 बँकात या बँकेचा 2012 साली 60 वा क्रमांक लागतो. शाखा आणि कर्मचार्यांची संख्या लक्षात घेतल्यात स्टेट बँक ऑफ इंडिया जगातील सर्वात मोठी बँक ठरू शकेल. 1806 मध्ये बँक ऑफ कलकत्ता नावाने स्थापलेली हि बँक भारतीय उपखंडातील सर्वात जुनी बँक आहे असे म्हणतात.

भारतातील सर्वात मोठी बँकिंग आणि वित्तीय सेवा कंपनी असुन हिची 501 अब्ज डॉलर मालमत्ता व 157 परदेशी कार्यालय धरून एकुण 15003 शाखा होत्या. मुंबई नंतर दिल्लीत सर्वात जास्त शाखा आहेत. SBI अनिवासी

भारतीयांना भारतातील आणि भारता बाहेरील शाखांचा नेटवर्क मधून बँकिंग सेवा पुरवते. SBI च्या भारतात 14 प्रादेशिक hubs असून देशातील महत्त्वाच्या शहरामध्ये 57 विभागातील कार्यालये आहेत. एसबीआयच्या भारतीय व्यापारी बँकेमध्ये ठेवी आणि कर्ज स्वरूपात 20 % हिस्सा आहे.

बँकिंग म्हणजे कर्ज देण्यासाठी किंवा गुंतवणुकीचा लोकांच्या ठेवी स्वीकारून त्या ठेवी मागणी केल्यानंतर किंवा इतर प्रकारे परत करणे. अथवा धनादेशाद्वारे परत करणे होय.



SBI ची सेवा :-

1) एटीएम :-

एटीएम सेवेचा लाभ घेण्यासाठी ग्राहकाला बँकेकडे लेखी विनंती अर्ज करून एटीएम कार्ड घ्यावे लागते. ग्राहकाला बँकेने एटीएम कार्ड दिल्यानंतर बँकेने कार्ड एटीएम व्यवहारासाठी स्वीकृत करते. एटीएम कार्डचा वापर करण्यासाठी कार्ड धारकाला आणि बँकेच्या यांत्रिक प्रणालीला माहिती असते. एटीएममधून व्यवहार करतांना एटीएमच्या खाच्यात एटीएम घातल्यानंतर सांकेतिक क्रमांक टाकावा लागतो.

2) डेबिट कार्ड :-

डेबिट कार्ड हे एक असे पेमेंट आहे जे कोणत्याही बँक वापरकर्ताद्वारेखरेदी करण्यासाठी किंवा एटीएम मशीन मधून पैसे काढण्यासाठी किंवा ऑनलाईन पेमेंट करण्यासाठी वापरले जाते. डेबिट कार्ड हे आपल्या SAVINGS ACCOUNT सोबत जोडलेले असते. याद्वारे आपण बँकेत न जाता आपले पैसे काढू शकतो. किंवा ऑनलाईन इलेक्ट्रोनिक बँकिंगच्या मदतीने आपण पैसे ट्रान्सफर किंवा पैशाचा व्यवहार करु शकतो.

3) Credit Card :-

आज ग्राहकाजवळ वस्तू किंवा सेवा खरेदी करण्याकरिता पैसा नसला तरीही या सोयीमुळे सहजपणे खरेदी करु शकतो. व काही कालावधीने जवळपास वस्तू खरेदी केल्यापासून 45 ते 50 दिवसाच्या आत केव्हाही ती रक्कम बँकेत जमा करु शकते. थोडक्यात हा व्यवहारात बँकेत ग्राहकाला 45 - 50 दिवसाकरिता म्हणजे विशिष्ट दिवसाकरिता दिलेले एक कर्जच असते.

म्हणून अशा विशिष्ट मुदादतीसाठी वापरण्यास देण्यात येणाऱ्या राशीला कर्ज म्हणून संबोधले जाते.

Provides Inward Foreign remittances.

Provides Locker Services

Provides Home Loan, Personal Loan, Educational Loan, etc.

It Offers to open accounts in public provident fund schemes.

Provides ATM Services across India

Facilities of E-pay & E-rail.

SBI बँकेचे कार्य –

* ती सरकारी बँक म्हणून काम करते. म्हणजे ती सरकारच्या वतीने पैसा गोळा करते. आणि पेमेंट करते आणि सार्वजनिक कर्ज व्यवस्थापित करते.

* बँकर्सची बँक म्हणून काम करते ते व्यावसायिक बँकाकडून ठेवी घेते आणि त्यांना कर्ज देते. हे व्यावसायिक बंकासाठी क्लिअरिंग हाउस म्हणून देखील कार्य करते. व्यापारी बँकाच्या एक्सचेंजच्या बिलामध्ये पुन्हा सूट देते आणि व्यावसायिक बँकांना पैसे पाठवण्याची सुविधा प्रदान करते.

सामान्य बँकिंग कार्ये –

1) याला लोकांकडून ठेवी मिळतात.

2) ते पत्र सिक्युरिटीजवळ कर्ज आणि अग्रिम देते ज्यात वस्तू एक्सचेंजची बिले, प्रॉमिसरी नोट्स कंपन्यांचे पुर्ण दिलेले शेअर्स स्थावर मालमत्ता किंवा शीर्षकाची कागदपत्रे , डिवेचर्स इ. ....

3) ते आपला अतिरिक्त निधी सरकारी रोखे , रेल्वे रोखे आणि कॉर्पोरेशन रोखे आणि ट्रेझरी बिलांमध्ये गुंतवते.

* **इतर कार्ये –**

1) ते सोने आणि चांदी खरेदी आणि विक्री करते.

2) ती सहकारी बँकाचे एजंट म्हणून काम करते.

3) ते देवाणघेवाणीची बिल काढते आणि भारताबाहेर देय असलेली क्रेडीट पत्रे देते.

निष्कर्ष :-

आजच्या युगात बँकिंग ला खूप महत्त्व आहे. कारण बँकिंगमध्ये आपल्याला अनेक सुविधा मिळतात. त्यामुळे आपले काम खूप सोपे होते. आपला देश जर विकसित होत असेल टर त्यात बँकिंग क्षेत्राचा खूप मोठा वाट आहे. आणि जर आपला देश बँकिंग क्षेत्रात मोठा प्रगती करत राहिला तर बँकिंग सेवा वाढण्याची शक्यता अधिक आहे. ज्यामुळे लोकांचे जीवन अधिक सुखकर होईल . आणि देशाचा विकास लवकरच होईल. तथापि सुरवातीस बँकाच्या कार्यामध्ये फक्त धन जमा करणे. आणि कर्जे देणे समाविष्ट करणे.

ते आता अनेक अन्य सेवाही देत आहेत. या सर्व उदिष्टाचा ग्राहकांना आपल्या वित्तीशी मदत करणे आहे. बँक कोणत्याही देशाचा एक महत्त्वपूर्ण हिस्सा आहे. आधुनिक बँकिंग सेवा व्यवसाय उद्योग विकास आणि इतर कार्यपद्धती सहजतेने मदत करण्यात मदत होते. बँक आणि इतर वित्त संस्था जो व्यवसाय विकास करतो. ते देते. आणि लोकांना धन आणि अन्य मूल्यवान संस्थेचे संरक्षण करते. एखाद्या देशाच्या अर्थव्यवस्थेच्या विकासामध्ये एक अभिन्न भूमिका निभावते आहेत.

संदर्भ :-

1) https:/www.slideshare.net E - Banking
2) https:/www.scribd.com E - Banking
3) https://byjus.com/commerce/e-banking E – Banking
4) https://www.idfcfirstbank.com/finfirst-blogs/finance/what-is-e-banking
5) https:/www.studouc.com

Arts & Commerce College * Warvat Bakal *

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Arts & Commerce College,
Warvat Bakal Dist.Buldana