GOVT. BILASA GIRLS' P.G. (Auto.) COLLEGE

Link Road, Bilaspur (C.G.)
Phone No. : 07752-224249, Website : www.bilasagrilscollege.ac.in

बिलासपुर (छ.ग.)

SYLLABUS

B.Sc.
Semester - I & II

2021-22

Rules and Regulations for the Semester System at the Graduation Level

1. These subjects are compulsory for all students:-
   (a) Environmental Studies (I Semester)
   (b) English Language (II and III Semester)
   (c) Hindi Language (IV and V Semester)
   (d) Skill Based Course (VI Semester)

2. In each semester there will be only one theory paper in each elective Subject.

3. For Honours Degree Course, there will be one additional theory paper in each semester i.e. semesters, III to VI.

   For Honours Degree Course, separate practical classes will be held round the year but the examinations shall be held only in even semesters i.e. semesters II, IV and VI.

4. **Marks Pattern:-**
   (i) For non practical subjects, each theory paper will be of 100 marks i.e. 80 External + 20 Internal.
   (ii) For practical subjects, each theory paper will be of 75 marks i.e. 60 External + 15 Internal.
   (iii) Practical examination will be of 50 marks. Practical Classes will be held round the year but examination shall be held only in even semesters i.e. semesters II, IV and VI.

5. **Theory Examination:-**
   Duration for theory examination shall be of two and half hours.

6. **Practical Examination:-**
   Duration for Practical examination shall be as suggested in the syllabi.

7. **Admission Period:-**
   (i) Admissions in the First Semester shall be completed before 15th of July every year.
   (ii) Admissions in Semesters i.e. II, III, IV, V and VI shall be completed within 7 days after the completion of examinations on the provisional basis.
   (iii) The provisional admission shall be regularized within 7 days from the date of declaration of result.
   (iv) Request for permission for late admission shall not be entertained.

8. **Schedule of Classes-**
   (i) I Semester's classes will be commenced from 16th of July every year
   (ii) III and V Semester's classes will be commenced from 2nd July every year.
   (iii) II, IV and VI Semester's classes will be commenced from 2nd January every year.
   (iv) All the classes shall be continued till seven days prior to the commencement of the examination.

9. **Examination Schedule- Tentative Schedules of examinations are as under-**
   (i) Odd semester (I, III & V)- 20th November to 20th December.
   (ii) Even semester (II, IV & VI) - 15th April to 14th May.

10. **Examination Pattern -**
    (a) Questions will be asked Unit wise and Section wise. Questions will be set from all Units Covering the entire syllabi.
    (b) For non practical subjects, maximum marks will be 80 (External).
    (c) For the practical based subjects, maximum marks will be 60 (External).
    (d) In each theory paper there will be three sections and the marks distributed for different sections will be in the following pattern –

Theory (Non- Practical):- There will be three sections A, B and C in the question paper.
Section - A Objective Type/ In few words (30 words)

There will be 15 questions to be set, three from each unit and 10 to be attempted. Each question will carry 2 marks.

Section - B Short Answer Type (60 words)
There will be 5 questions to be set, 1 from each unit and all five questions to be attempted. Each question will carry 6 marks.

Section - C Long Answer / Eassy Type Question
There will be 5 questions to be set, 1 from each unit and 2 to be attempted. Each question will carry 15 marks.

Marks Scheme for - Non-practical subject –

Types of Questions	Question to be set from each Unit	Total No. of Questions	Questions to be solved	Marks assigned	Total Marks
Objective / In few words	03	15	10	02	20
Short Answer Type Questions	01	05	05	06	30
Long / Essay type of questions	01	05	02	15	30
					Total - 80

(i)   Theory (Practical Subject):- There will be three sections A, B and C in the question paper.

Section - A Objective Type/ In few words (30 words)
There will be 15 questions to be set, three from each unit and 10 to be attempted. Each question will carry 2 marks.

Section - B Short Answer Type (60 words)
There will be 5 questions to be set, 1 from each unit and all five questions to be attempted. Each question will carry 4 marks.

Section - C Long Answer / Eassy Type Question
There will be 5 questions to be set, 1 from each unit and 2 to be attempted. Each question will carry 10 marks.

Marks Scheme for - Practical Subject –

Types of Questions	Question to be set from each Unit	Total No. of Questions	Questions to be solved	Marks assigned	Total Marks
Objective / In few words	03	15	10	02	20
Short Answer Type Questions	01	05	05	04	20
Long / Essay type of questions	01	05	02	10	20
					Total - 60

For question papers of compulsory papers of General group subjects i.e. Environmental Studies, English Language, Hindi Language and Skill Based Course, the pattern of question shall be applicable as suggested by the concerned Board of Studies.

(ii) Practical

	Each Practical
Laboratory Note Book / Project	10
Vive voce	10
Lab work / Field work	30
	Total - 50

(e)   In odd semester examination, a candidate shall appear in papers of odd semester(s) only. Similarly in even semester examinations, a candidate shall appear in papers of even semester(s) only. Papers of odd and even semesters shall not be confined in one examination.

(f)   Minimum passing marks for external/ semester end theory and practical shall be 34%.

(g)   There shall be provision of 3 grace marks and it would be distributed in maximum two theory Papers / Practical.

Internal Assessment

- Internal Tests are compulsory for theory papers and must be held as per following calendar:-

  Odd Semesters   1st Test - August, 2nd Test - October and 01 Assignment (during semester)

  Even Semesters   1st Test - February, 2nd Test - March and 01 Assignment (during semester)

- Each test & Assignment will be of 20 marks for the subjects without practical & 15 marks for the subjects having practicals. Average of the marks obtained in the best of two tests & assignment shall be incorporated as the final marks. Qualifying marks is 40%.

- If a candidate failed to attend the test on bonafide grounds, one special test may be arranged on the production of relevant documents, before submission of application forms and fees to the office.

- The Unit tests/Assignment marks to be sent to the examination cell of the college as per notification to be issued by the Principal/ Controller Examination from time to time.

- If a candidate (whose status is Regular / Ex/Supplementary) failed in First Year of the current session (2013-14) of annual system will be appeared in the first semester examination as ex-student with under the rules and regulations of Semester System. Number of Internal Test of passed year (2013-14) will not be incorporated or carried forward.

	Non Practical Subject		Practical Subject	
	External	Internal	External	Internal
MAX MARKS	80	20	60	15
MIN MARKS	28	08	21	06

Eligibility criteria for appearing in the examinations

(i)   A candidate should have 75% of attendance both in theory and practical classes. 65% attendance may be considered only on special circumstances and on certification by the Principal of the college.

(ii)   A candidate shall have to qualify in the internal tests securing at least 40% marks.

(iii)   A candidate shall be allowed to appear in those papers only in which she has secured qualifying marks in internal test.

(iv)   If a candidate after taking admission in 1st semester could not continue the classes or could not obtain eligibility cannot appear in the 1st semester examinations. In such cases the student will not be allowed to continue in second semester and she has to continue the classes and obtain eligibility in 1st semester again in next academic year as ex-student.

11.   Lecture Periods /Classes

There shall be a minimum of 50-60 hours Classes for each theory papers in respective course. Minimum of 50-60 hours shall be for each practical paper. This shall be strictly adhered to.

12.   Other Guidelines

(i)   There will be no provision for Revaluation, Supplementry or Betterment (Division Improvement).

(ii)   A candidate has to clear all the papers within 12 semesters (six years) from the year of first admission in the programme.

(iii)   A candidate will choose Honours subject just before the start of third semester from any one of the three elective subjects /group selected by her in the first semester. A candidate can change the Honours subject within 15 days from the date of admission in the third semester.

(iv)   The system of credit of ten point scale examination marks in the final mark sheet shall be introduced only after its formal approval by the competent authorities.

(v)   The system of Choice based credit system and Gradation system shall be introduced only after its formal approval by the competent authorities.

For Honours Degree Course (Total Marks: 2800).

13.   **Admission -**
       The process of admission in Honours Degree Course will be as follows -
       (i)   Student shall select course (Pass Course / Honours Degree Course) at the time of first admission in the college.
       (ii)   Admission shall be on merit basis after receiving the application from students.
       (iii) Number of seats for Honours Degree Course will be decided as per the Govt. Rules.

(A) Each theory Paper (Non Practical Subject)

Each Theory Paper		Internal Assessment	
Full Marks	Minimum Passing 34%	Full Marks	Minimum Marks 40%
80	28	20	08

(B)   Each theory Paper (Practical Subject)

Each Theory Paper		Internal Assessment	
Full Marks	Minimum Passing 34%	Full Marks	Minimum Marks 40%
60	21	15	06

(C)   Each Practical Paper

Minimum Passing Percentage	Full Marks	Minimum Passing Marks
34%	50	17

(D)   Grace Marks
Total/Maximum 03 in two theory paper/practical.

Amendments in Promotion Rules for Semester System at the Graduation Level

(a)   A Candidate is eligible to continue the second semester classes immediately after the 1st Semester examinations and can appear in the 2nd semester examinations notwithstanding the number of arrear papers in 1st semester provided she must have appeared in the 1st semester examination.

(b)   A candidate will be promoted to 3rd semester with not more than two papers of 1st semester and she will continue to attend classes of 3rd semester provisionally. She will be allowed to get final admission in the 3rd semester with maximum of four back papers in all 1st semester and 2nd semester.

(c)   A Candidate is eligible to continue the 4th semester classes immediately after 3rd semester examination and can appear in the 4th semester examination with maximum 2 back papers in 1st semester and/or any numbers of back papers in 2nd and 3rd semester.

(d)   A candidate will be promoted in 5th semester with not more than 2 back papers in 3rd semester and not more than 4 back papers in all 3rd and 4th semeser provided she has cleared 1st and 2nd semester examination.

(e)   A candidate is eligible to continue the 6th semester immediately after the 5th semester examination and can appear in 6th semester examination with maximum of 2 back papers in 3rd semester and/or any number of back papers in 4th and 5th semester examination.

(f)   If a Candidate of 6th Semester is passed in all the semesters except the 5th Semester with back in only one subject, she is allowed to appear in the back paper of the 5th Semester with the examination of 6th Semester.

(g) The students at the UG Level can view their valued answer copies and apply for the **Challenged Valuation** within 03 days from the date of the declaration of the result.

(h) A candidate will be eligible to get Graduation and Graduation Honours degree after passing all the six semester examination. For cleaning all semester papers a candidate will be given a period 6 years (12 semesters) from the year of first admission.

सेमेस्टर स्नातक स्तर प्रमोशन नियम

प्रथम सेमेस्टर में प्रवेश की पात्रता:-

- प्रथम सेमेस्टर में छात्राओं का प्रवेश छ.ग. शासन के प्रवेश नियम के आधार पर किया जावेगा।

द्वितीय सेमेस्टर में प्रवेश की पात्रता:-

- विद्यार्थी को प्रथम सेमेस्टर की परीक्षा के तत्काल बाद कितने भी विषयों में बैक के साथ द्वितीय सेमेस्टर में अध्ययन की पात्रता होगी, बशर्ते वह प्रथम सेमेस्टर की परीक्षा में शामिल हुआ हो।

तृतीय सेमेस्टर में प्रवेश की पात्रता:-

- प्रथम सेमेस्टर में 02 से अधिक विषयों में बैक नही होना चाहिए।
- प्रथम एवं द्वितीय सेमेस्टर में सम्मिलित रूप से 04 विषयों से अधिक में बैक न हो।

चतुर्थ सेमेस्टर में प्रवेश की पात्रता:-

- प्रथम सेमेस्टर में 02 से अधिक विषयों में बैक नही होना चाहिए।
- द्वितीय एवं तृतीय सेमेस्टर में कितने भी विषयों में बैक हो।

पंचम सेमेस्टर में प्रवेश की पात्रता:-

- प्रथम सेमेस्टर उत्तीर्ण होना चाहिए।
- द्वितीय सेमेस्टर उत्तीर्ण होना चाहिए।
- तृतीय सेमेस्टर में 02 से अधिक विषयों में बैक न हो।
- तृतीय एवं चतुर्थ सेमेस्टर में सम्मिलित रूप से 04 विषयों से अधिक में बैक न हो।

षष्ठम् सेमेस्टर में प्रवेश की पात्रता:-

- प्रथम सेमेस्टर उत्तीर्ण होना चाहिए।
- द्वितीय सेमेस्टर उत्तीर्ण होना चाहिए।
- तृतीय सेमेस्टर में 02 से अधिक विषयों में बैक न हो।
- चतुर्थ एवं पंचम सेमेस्टर में कितने भी विषयों में बैक हो।
- यदि कोई छात्रा सभी सेमेस्टर में उत्तीर्ण है एवं केवल पंचम सेमेस्टर में 01 (एक) विषय में बैक है, ऐसी छात्रा को षष्ठम् सेमेस्टर की परीक्षा के साथ परीक्षा देने का अवसर दिया जावेगा।

- विशेष -
  - ✓ मूल्यांकित उत्तर-पुस्तिकाओं के अवलोकन व Challenged Valuation की प्रक्रिया इस स्नातक स्तर सेमेस्टर परीक्षा अप्रैल-मई से लागू है। छात्राएं परीक्षा परिणाम घोषित होने की तिथि से 3 दिन के भीतर इस हेतु आवेदन प्राचार्य को दे सकती हैं।
  - ✓ विद्यार्थी को स्नातक एवं स्नातक आर्नस की उपाधि तभी प्राप्त होगी जबकि उसनें सभी 06 सेमेस्टर की परीक्षायें उत्तीर्ण कर ली हों एवं 06 सेमेस्टर की परीक्षायें उत्तीर्ण करने हेतु उसे प्रथम प्रवेश की तिथि से लेकर 06 वर्षों की अवधि प्राप्त होगी।
  - ✓ छात्रा जिस सत्र बैक की परीक्षा में सम्मिलित होगी उसी सत्र का पाठ्यक्रम एवं परीक्षा संबंधी नियम लागू होगा।

M.M. 60

SYLLABUS FOR ENVIRONMENTAL STUDIES" FOR UNDER GRADUATE

UNIT-I THE MULTI DISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES :

Definition, scope and importance Need for public awarness.

Natural Resources :

Renewable and nonrenewable resources :

Natural resources and associated Problems.

(a) Forest resources : Use and over-exploitation, deforestation, case studies, Timber extraction, mining dams and their effects on forests and tribal people.

(b) Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.

(c) Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

(d) food resources : Word food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilize-pesticide problems, water logging, salinity, case studies.

(e) Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.

(f) Land resources : Land as a resources, fand degradation, man induced landslides, soil erosion and desertification.-Role of an individual in conservation of natural resources.

-Equitable use of resources for sustainable life-styles.   (9 Lecture)

UNIT-II

(a)ECOSYSTEMS

Concept of an ecosystems. Structure and function of an ecosystem.

- Producers, consumers and decomposers
- Energy flow in the ecosystem.
- Ecological succession.
- Food chains, food webs and ecosystem.
- Introduction, types, characteristic features, structure and function of the following ecosystem:

a. Forest ecosystem
b. Grassland ecosystem
c. Desert ecosystem
d. Aquatic ecosystems (Ponds, streams, lakes, rivers, oceans, estuaries)   (9 Lecture)

(b)Biodiversity and its Conservation

- Introduction - Definition : genetic, species and ecosystem diversity.
- Biogeographically 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 mega-diversity nation.
- Hot-spots of biodiversity :
- Threats to biodiversity : habitat loss, poaching of wildlife, manwildife conflicts.
- Endangered and endemic species of India.
- Conservation of biodiversity : In situ and Ex-situ conservation of biodiversity. (9 Lecture)

UNIT-III
(A)Environmental Pollution
Definition Causes, effects and control measures of -

a. Air pollution.
b. Water pollution.
c. Soil pollution.
d. Marine pollution.
e. Noise pollution.
f. Nuclear hazards.
Soil waste management : Causes, effects and control measures of urban and industrial wastes.
Role of an individual in prevention of pollution.
Pollution case studies
Disaster management : floods, earthquake, cyclone and Landslides.

(B)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. 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.
- Rofe ot Information Technology in Environment and Human Health.
- Case Studies. (9 Lecture)

UNIT-IV
Genral Background And Historical Perspective-Historical Development ANd Concept Of Human Rights-Meaning and Definations of human rights,kind and classifications of human rights
Proctions of human rights under the UNO Charter,protection of human rights under the univer declaration of human rights 1948.
Convention on the elimination of all forms of Discrimination against women.
Cinvention on the rights of the child 1989.

Unit-V
Impect of human rights Norms in India, Human rights under the constitution on India,Fundamer rights under the constitution of india, Directive Principles of state policy under the constitutior india, Enforcement of human rights in india
Protection on human rights under the human rights act 1993-national human rights commiss state human rights commission and human rights court in india.
Fundamental duties under the constitution of india.

Field work
FIELD WORK

Visit to a local area to document environmental assets-river/forst/grassland/hill/mountan.
Visit to local polluted site : Urban/Rura/Industrial/Agriculture.
Study of common plants, insects, birds.
Study of simple ecosystems-pond, river, hill slopes, etc. (Field work Equal to 5 lecture hours)

REFERENCES :

1. Agarwal K.C. 2001 Environmental Biology, Nidi Publ. Ltd. Bikaner.
2. Bhairucha Erach, the Biodiversity of India, Mapin Publishing Pvt. Ltd Ahmedabad 380 013, India, Email : mapin @ ice net net (R)
3. Bruinner R.C. 1989, Hazardous waste Incineration, Mc Graw Hill inc 480p.
4. Clark R.S. Marine Pollution, Calderon Press Oxford (TB)
5. Cunningham, W.P. Cooper, T.H. Gorhani E & Hepworth, M.T. 200
6. Dr. A.K. Environmental Chemistry Wiley Eastern Ltd.
7. Down to Earth, Centre for Science and Environment (R)
8. Gloick, H.P. 1993 Water in crisis, Pacific Institute for studies in Deve, Environment & security. Stockholm Eng. 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, Cabridge Univ. Press 1140p.
11. Jadhav H. & Bhosale, V.H. 1995, Environmental Protection and Laws Himalaya Pub. House. Delhi 284p.
12. McKinney M.L. & School R.M. 1996, Environmental Science Publication (TB).
13. Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB).
14. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co. (TB).
15. Odum, e.P. 1971, Fundamentals of Ecology, W.B. Saunders Co. USA, 574p.
16. Rao M.N. & Datta, A.K. 1987, Waste Water treatment. Oxford & IBH Publ. Co. Pvt. Ltd. 345p.

BCMP - 102
SEMESTER - I
FINACIAL ACCOUNTING
PAPER - II
M.M. 80

Unit -1 Concept of Double Entry System

Preparation of journal.sub division of Journal: Cash book, preparation of Ledger, Preparation of trial balance, capital & Revenue, Accounting standard Meaning, defination AS to AS 10.

Unit - I I Final Accounts with Adjustment

Trading Profit & Loss a/c ,Balance sheet, adjustment entries.

Unit - III Cocept of depreciation

Accounting for depreciation(As per accounting standard 6) Fixed Installment Method, Diminishing Balance method, Annuity Method, depreciation Fund method, Provisions and Reserves.

unit - IV Special Accounting Areas :

Hire-purchase and installment purchase system : Meaning of hirepurchase contract, Legal provision regarding hire-purchase contract;
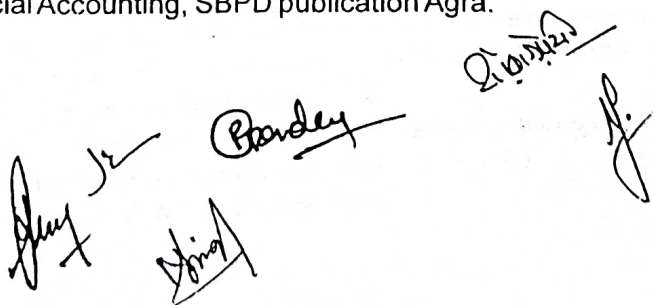
Accounting for goods of substantial sale values,installment purchase system.

Unit - V Partnership

Dissolution of Partnership firm, Amalgamation of Partnership Firm..

SUGGESTED READINGS :

1. Anthony, R.N. and Reece, J.S. : Accounting Principles : Richard Irwin Inc.
2. Gupta, R.L. and Radhaswamy, M: Finacial Accounting ; Sultan chand and Sons, New Delhi.
3. Monga J.R. Ahuja Girish, and Sehgal Ashok : Financial Accountion : Mayur Paper Back, Noida.
4. Shikla. M.C. Grewal T.S. and Gupta, S.C. Advanced Accounts; S.Chand & Co. New Delhi.
5. Compendium of Statement and Standards of Accounting : The Institite of Chartered Accountants of India New Delhi.
6. Agrawala A.N. Agrawala K.N. Higher Sciences of Accountancy : Kitab Mahal, Allahabad.

7. Shukla S. M. Financial Accounting, Sahitya Bhavan Agra.
8. Singh S. K. Financial Accounting, SBPD publication Agra.

NEW CURRICULUM OF B.Sc. CHEMISTRY
SEMESTER I (2021-2022)
MM-60: HOURS-45, CREDIT-3

The new curriculum will comprise of one theory paper OF 60 marks in each semester and practical work of 50 mark per year. The curriculum is as per the UGC norms & conforming to the directives of the Govt. of Chhattisgarh.

UNIT-I
A. ATOMIC STRUCTURE
Bohr's theory, its limitation and atomic spectrum of hydrogen atom. General idea of de-Broglie matter-waves, Heisenberg uncertainty principle, Schrödinger wave equation, significance of Ψ and Ψ^2, radial & angular wave functions and probability distribution curves, quantum numbers, Atomic orbital and shapes of s, p, d orbitals, Aufbau and Pauli exclusion principles, Hund's Multiplicity rule, electronic configuration of the elements.

B. PERIODIC PROPERTIES
Detailed discussion of the following periodic properties of the elements, with reference to s and p-block. Trends in periodic table and applications in predicting and explaining the chemical behavior.

    a) Atomic and ionic radii,

    b) Ionization enthalpy,

    c) Electron gain enthalpy,

    d) Electronegativity, Pauling's, Mulliken's, Allred Rochow's scales.

    e) Effective nuclear charge, shielding or screening effect, Slater rules, variation of effective nuclear charge in periodic table.

UNIT-II
A. CHEMICAL BONDING I
Ionic bond: Ionic Solids - Ionic structures, radius ratio & co-ordination number, limitation of radius ratio rule, lattice defects, semiconductors, lattice energy Born- Haber cycle, Solvation energy and solubility of ionic solids, polarising power & polarisabilitry of ions, Fajans rule, Ionic character in covalent compounds: Bond moment and dipole moment, Percentage ionic character from dipole moment and electronegatiity difference, Metallic bond-free electron, Valence bond & band theories.

B. CHEMICAL BONDING II
Covalent bond: Lewis structure, Valence bond theory and its limitations, Concept of hybridization, Energetics of hybridization, equivalent and non-equivalent hybrid orbitals. Valence shell electron pair repulsion theory (VSEPR), shapes of the following simple molecules and ions containing lone pairs and bond pairs of electrons: H_2O, NH_3, PCl_3, PCl_5, SF_6. H_3O^+, SF_4, ClF_3, and ICl_2^- Molecular orbital theory. Bond order and bond

strength, Molecular orbital diagrams of diatomic and simple polyatomic molecules N2, O2, F2, CO, NO.

UNIT-III
BASICS OF ORGANIC CHEMISTRY

Hybridization, Shapes of molecules, Influence of hybridization on bond properties. Electronic Displacements: Inductive, electromeric, resonance and mesomeric effects, hyperconjugation and their applications; Dipole moment. Electrophiles and Nucleophiles; Nucleophilicity and basicity; Homolytic and Heterolytic cleavage, Generation, shape and relative stability of Carbocations, Carbanions, Free radicals, Carbenes and Nitrenes. Introduction to types of organic reactions: Addition, Elimination and Substitution reactions.

UNIT-IV
STEREOCHEMISTRY & CONFORMATIONAL ANALYSIS

Optical Isomerism: Optical Activity, Specific Rotation, Chirality/Asymmetry, Enantiomers, Molecules with two or more chiral-centres, Diastereoisomers, meso compounds, Relative and absolute configuration: Fischer, Newmann and Sawhorse Projection formulae and their interconversions; Erythrose and threose, D/L, d/l system of nomenclature, Cahn-Ingold-Prelog system of nomenclature (C.I.P rules), R/S nomenclature. Geometrical isomerism: cis–trans, syn-anti and E/Z notations. Conformational analysis of alkanes, ethane, butane, cyclohexane and sugars. Relative stability and Energy diagrams. Types of cycloalkanes and their relative stability, Baeyer strain theory: Theory of strainless rings, Chair, Boat and Twist boat conformation of cyclohexane with energy diagrams; Relative stability of mono-substituted cycloalkanes and disubstituted cyclohexane.

UNIT-V
A . MATHEMATICAL CONCEPTS FOR CHEMIST

Basic Mathematical Concepts: Logarithmic relations, curve sketching, linear graphs, Properties of straight line, slope and intercept, Functions, Differentiation of functions, maxima and minima; integrals; ordinary differential equations; vectors and matrices; determinants; Permutation and combination and probability theory, Significant figures and their applications.

B . GASEOUS STATE CHEMISTRY

Kinetic molecular model of a gas: postulates and derivation of the kinetic gas equation; collision frequency; collision diameter; mean free path; Maxwell distribution and its use in evaluating molecular velocities (average, root mean square and most probable) and average kinetic energy, law of equipartition of energy, degrees of freedom and molecular basis of heat capacities. Joule Thompson effect, Liquification of Gases.
Behaviour of real gases: Deviations from ideal gas behaviour, compressibility factor (Z), and its variation with pressure and temperature for different gases. Causes of deviation from ideal behaviour. van der Waals equation of state, its derivation and application in explaining real gas behaviour, calculation of Boyle temperature. Isotherms of real gases and their comparison with van der Waals isotherms, continuity of states, critical state,

relation between critical constants and van der Waals constants, law of corresponding states.

REFERENCE BOOKS:

1. Lee, J. D. Concise Inorganic Chemistry ELBS, 1991.

2. Douglas, B.E. and McDaniel, D.H. Concepts & Models of Inorganic Chemistry Oxford, 1970

3. Atkins, P.W. & Paula, J. Physical Chemistry, 10th Ed., Oxford University Press, 2014.

4. Day, M.C. and Selbin, J. Theoretical Inorganic Chemistry, ACS Publications, 1962.

5. Rodger, G.E. Inorganic and Solid State Chemistry, Cengage Learning India Edition, 2002.

6. Puri, B. R., Sharma, L. R. and Kalia, K. C., Principles of Inorganic Chemistry, Milestone Publishers/ Vishal Publishing Co.; 33rd Edition 2016

7. Madan, R. D. Modern Inorganic Chemistry, S Chand Publishing, 1987.

8. Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd.(Pearson   Education).

9. Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

10. Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

11. Eliel, E. L. &Wilen, S. H. Stereochemistry of Organic Compounds, Wiley: London, 1994.
12.Kalsi, P. S. Stereochemistry Conformation and Mechanism, New Age International, 2005.

13. McMurry, J.E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Edition, 2013.

14. Organic Chemistry, Paula Y. Bruice, 2nd Edition, Prentice-Hall, International Edition (1998).

15. A Guide Book of Reaction Mechanism by Peter Sykes.
16.Atkins, P. W. & Paula, J. de Atkin's Physical Chemistry 10th Ed., Oxford University Press (2014).
17. Ball, D. W. Physical Chemistry Thomson Press, India (2007).

18. Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).

19. Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier: NOIDA, UP (2009).

20. Engel, T. & Reid, P. Physical Chemistry 3rd Ed. Pearson (2013).

21. Puri, B.R., Sharma, L. R. and Pathania, M.S., Principles of Physical Chemistry, Vishal Publishing Co., 47th Ed. (2016).

22. Bahl, A., Bahl, B.S. and Tuli, G.D. Essentials of Physical Chemistry, S Chand Publ. (2010).

23. Rakshit P.C., Physical Chemistry, Sarat Book House Ed. (2014).

B. Sc. First Semester: BOTANY
Core Course -CCB – 01

[*Biodiversity (Microbes, Algae, Fungi and Archegoniate)*]
(Credits: Theory-3, Practicals-2)
THEORY: Lectures – 45 Hours / 68-70 Periods

Unit 1: Microbes (09 Hours / 14 Periods)

Viruses – Discovery, general structure, multiplication, DNA virus (T-phage); Lytic and lysogenic cycle, RNA virus (TMV); Economic importance; Bacteria – General characters and cell structure; Reproduction – vegetative, asexual and recombination (conjugation, transformation and transduction); General account of Actinomycetes; Economic importance.

Unit 2: Algae (09 Hours / 14 Periods)

General characteristics; Range of thallus organization and reproduction;Classification of algae;Morphology and life-cycles of the following: *Volvox, Oedogonium, Chara. Vaucheria, Sargassum, Polysiphonia.* General account of Cyanobacteria; Economic importance of algae

Unit 3: Fungi (09 Hours / 14 Periods)

General characteristics, range of thallus organization, nutrition, reproduction and classification; life cycle of *Rhizopus. Penicillium, Puccinia, Agaricus,Alternaria&Colletotrichum;*Symbiotic Associations-Lichens:General account, reproduction and significance; Mycorrhiza: ectomycorrhiza andendomycorrhiza and their significance

U nit 4: Amphibious and Early land plants (09 Hours / 14 Periods)

Bryophytes: General characteristics, adaptations to land habit, Classification, Range of thallus-organization. Morphology, anatomy and reproduction of *Riccia,Marchantia, Anthoceros and Funaria*(Developmental details not to be included). Ecology and economic importance of bryophytes with special mention of *Sphagnum.*
Basic concept and types of fossil; modern techniques;Early land plants (*Rhynia&Cooksonia*)

Unit 5: Pteridophytesand Gymnosperms (09 Hours / 14 Periods)

Pteridophytes: General characteristics, classification, concept of heterospory, seed habit and stelar evolution. Morphology, anatomy and reproduction of*Lycopodium,Selaginella* and *Equisetum* (Developmentaldetails not to be included).
Gymnosperms: General characteristics, classification. Classification, morphology, anatomy andreproduction of *Cycas*and *Pinus.* (Developmental details not to be included). Economicimportance of Gymnosperms.

Signature of Convener & Members, Board of Studies:

> ## Practical: Lab work (2 Credits=30 Hours /45 Periods)

1. Gram Staining of Bacteria
2. Plant disease symptoms
3. Algae
4. Fungi
5. Bryophyte
6. Pteridophyta
7. Gymnosperm

Suggested Readings

1. Kumar, H.D. (1999). Introductory phycology.Affiliated East-West.Press Pvt. Ltd. Delhi.2ndedition.
2. Tortora, G.J., Funke, B.R., Case, C.L. (2010). Microbiology: An Introduction, Pearson Benjamin Cummings, U.S.A. 10th edition.
3. Sethi, I.K. and Walia, S.K. (2011). Text book of Fungi & Their Allies, MacMillan Publishers Pvt. Ltd., Delhi.
4. Alexopoulos, C.J., Mims, C.W., Blackwell, M. (1996). Introductory Mycology, John Wiley and Sons (Asia), Singapore.4th edition.
5. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R., (2005). Biology.Tata McGraw Hill, Delhi, India.
6. Vashishta, P.C., Sinha, A.K., Kumar, A., (2010). Pteridophyta, S. Chand. Delhi, India.
7. Bhatnagar, S.P. and Moitra, A. (1996). Gymnosperms. New Age International (P) Ltd Publishers, New Delhi, India.
8. Parihar, N.S. (1991). An introduction to Embryophyta. Vol. I. Bryophyta. Central Book Depot, Allahabad.

Signature of Convener & Members, Board of Studies:

09.10.2021

Govt. Bilasa Girls P.G. College Bilaspur (C.G.)

Session 2021-22
B.Sc. Semester I
SUBJECT ZOOLOGY
Paper (Pass Course)

(Cell Biology and Non-Chordata) LECTURES:45

Max. Marks : 60

Min. Pass Marks :21

Unit:I

1. The cell (Prokaryotic andEukaryotic)
2. Organization of Cell: Extra-nuclear andnuclear
   Plasma membrane, Mitochondria, Endoplasmic reticulum, Golgi body, Ribosome and Lysosome).
3. Nucleus, Chromosomes, DNA andRNA

Unit:II

1. Cell division (Mitosis andMeiosis).
2. An elementary idea of Cancer cell And Celltransformation. Types of cancer & Causative agents of it
3. An elementary idea of Immunity: Innate & Acquired Immunity, Antigen, antibody and their interactions

Unit:III

1. General characters and classification of Phylum Protozoa, Porifera, and Coelenterata up toorder.
2. Protozoa: Type study - Paramecium,
3. Porifera: Type study -Sycon.
4. Coelenterata: Type study -Obelia

Unit: IV

1. General characters and classification of Phylum Platyhelminthes, Nemathelminthes, Annelida and Arthropoda up toorder.
2. Platyhelminthes and Nemathelminthes: Type Study – Fasciola,Ascaris
3. Annelida: Type Study -Pheretima.
4. Arthropoda: Type Study -Palaemone.

Unit:V

1. General characters and classification of Phylum Mollusca and Echinodermata up to order. Classification ofHemichordata
2. Mollusca: Type Study -Pila.
3. Echinodermata- Type Study- Asterias(Starfish).
4. Hemichordata- Typestudy-Balanoglossus

1. Dr. Rashmi Sao   2.   3. SRahallin 16.9.21

4.   5.   6.

7   8   9

SUGGESTED READINGS

1.Karp, G. (2010). *Cell and Molecular Biology: Concepts and Experiments*. VI Edition. John Wiley and Sons. Inc.

2. De Robertis, E.D.P. and De Robertis, E.M.F. (2006). *Cell and Molecular Biology*. VIII Edition. Lippincott Williams and Wilkins, Philadelphia.

3. Cooper, G.M. and Hausman, R.E. (2009). *The Cell: A Molecular Approach*. V Edition. ASM Press and Sunderland, Washington, D.C.; Sinauer Associates, MA.

4. Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. (2009). *The World of the Cell*. VII Edition. Pearson Benjamin Cummings Publishing, San Francisco.

5. Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008).

6.*Molecular Biology of the Cell*, V Edition, Garland publishing Inc., New York and London.

7. Barnes, R.D. (1982). *Invertebrate Zoology*, V Edition. Holt Saunders International Edition.

8. Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002).

9.*TheInvertebrates: A New Synthesis*, III Edition, Blackwell Science

3. Barrington, E.J.W. (1979). *Invertebrate Structure and Functions*. II Edition, E.L.B.S.andNelson

4. Boradale, L.A. and Potts, E.A. (1961). *Invertebrates: A Manual for the use of Students*. Asia Publishing Home

PRACTICAL CELL BIOLOGY

1. Gram's staining technique for visualization of prokaryotic cells
2. Study various stages of mitosis from permanent slides
3. Study various stages of meiosis from permanent slides.
4. Study the presence of Barr body in human female blood cells/cheek cells. (Preparation of permanent slides)

PRACTICAL INVERTEBRATES

1. Dissection of Earthworm, Cockroach, PalaemonandPila
2. Minor dissection—appendages of Prawn & hastate plate, mouth parts of insects,radullaofPila.(**Alternative methods: By Clay/Thermocol/drawing/Model etc.**)

Kingdom Protista
1. Study of *Paramecium* W.M., Binary fission and Conjugation in *Paramecium*
2. Life stages of *Plasmodium vivax, Trypanosmagambiense*and*Entamoebahistolytica* (Slides/Micro-photographs)
3. Examination of pond water for protists

Phylum Porifera
4. Study of *Sycon*(including T.S. and L.S.), *Hyalonema,* and *Euplectella*
5. Temporary mounts of spicules, gemmules and sponginfibres

Phylum Cnidaria
6. Study of *Obelia, Physalia, Millepora, Aurelia,* Ephyra larva, *Tubipora, Corallium, Alcyonium, Gorgonia, Metridium*(including T.S. and L.S.)

Phylum Ctenophora
7. Any one specimen/slide

Phylum Platyhelminthes
8. Study of adult *Schistosomahaematobium, Taeniasolium*and their life stages (Slides/microphotographs)

Phylum Nemathelminthes
9. Study of adult *Ascarislumbricoides, Wuchereriabancrofti*and their life stages (Slides/micro-photographs)

Phylum Annelida
10. Study of *Aphrodite, Nereis. Heteronereis, Sabella. Serpula, Chaetopterus, Pheretima, Hirudinaria*

11. T.S. through pharynx, gizzard, and typhlosolar intestine of earthworm.
12. T.S. through crop of leech
13. Virtual/Demonstration of Earthworm.

Phylum Arthropoda
14. Study of *Limulus, Palamnaeus, Palaemon, Daphnia, Balanus, Sacculina, Cancer, Eupagurus, Scolopendra, Julus,* termite, louse, honeybee, silk moth, wasp

Phylum Onychophora
15. Any one specimen/slide

Phylum Mollusca
16. Study of *Chiton, Dentalium, Pila, Doris, Helix, Unio, Ostrea, Mytilus, Loligo, Sepia, Octopus* and *Nautilus*

Phylum Echinodermata
17. Study of Echinoderm larvae
18. Study of *Pentaceros/Asterias, Ophiura, Clypeaster, Echinus, Echinocardium, Cucumaria* and *Antedon*

B.Sc. Part – I
Paper – I (First Semester)
MECHANICS, OSCILLATIONS AND PROPERTIES OF MATTER
(Paper Code 0793)

Unit – I   Cartesian, Cylindrical and Spherical coordinate system, Intertial and non-interatial frames of reference, uniformly rotating frame, Coriolis force and its applications. Motion under a central force, Kepler's laws. Effect of Centrifugal and Coriolis forces due to earth's rotation, Center of mass (C.M.), Lab and C.M. frame of reference, motion of C.M. of system of particles subject to external forces, elastic, and inelastic collisions in one and two dimensions, Scattering angle in the laboratory frame of reference, Conservation of linear and angular momentum, Conservation of energy.

Unit – 2   Rigid body motion, rotational motion, moments of inertia and their products, principal moments & axes. Introductory idea of Euler's equations. Potential well and Periodic Oscillations, case of harmonic small oscillations, differential equation and its solution, kinetic and potential energy, examples of simple harmonic oscillations : spring and mass system, simple and compound pendulum, torsional pendulum.

Unit – 3   Bifilar oscillations, Helmholtz resonator, LC circuit, vibrations of a magnet, oscillations of two masses connected by a spring. Superposition of two simple harmonic motions of the same frequency, Lissajous figures, damped harmonic oscillator, case of different frequencies. Power dissipation, quality factor, examples, driven (forced) harmonic oscillator, transient and steady states, power absorption, resonance.

Unit – 4   E as an accelerating field, electron gun, case of discharge tube, linear accelerator, E as deflecting field – CRO senstivity, Transverse B field, 180° deflection, mass spectrograph, curvatures of tracks for energy determination, principle of a cyclotron. Mutually perpendicular E and B fields : velocity selector, its resolution. Parallel E and B fields, positive ray parabolas, discovery of isotopes, elements of mass spectrography, principle of magnetic focusing lens.

Unit – 5   Elasticity : Strain and stress, elastic limit, Hooke's law, Modulus of rigidity, Poisson's ratio, Bulk modulus, relation connecting different elastic – constants, twisting couple of a cylinder (solid and hallow), Bending moment, Cantilever, Young modulus by bending of beam.

Viscosity : Poiseulle's equation of liquid flow through a narrow tube, equation of continuity. Euler's equation, Bernoulli's theorem, viscous fluids, streamline and turbulent flow. Poiseulle's law, Coefficient of viscosity, Stoke's law, Surface tension and molecular interpretation of surface tension, Surface energy, Angle of contact, wetting.

TEXT AND REFERENCE BOOKS :

1. E.M. Purcell, ED Berkely physics course, vol. Mechanics (Mc. Gr. Hill) R.P. Feynman.
2. R.B. Lighton and M. Sands, the Feynman lectures in physics, vol. I (B) publications, Bombay, Delhi, Calcutta, Madras.
3. D.P. Khandelwal, Oscillations and waves (Himalaya Publishing House Bombay).
4. R.K. Ghosh, The Mathematics of waves and vibrations (Macmillan 1975)
5. J.C. Upadhyaya-Mechanics (Hindi and English Edition).
6. D.S. Mathur – Mechanics and properties of matter.
7. Brijlal and Subramanium – Oscillations and waves. Resnick and Halliday – Volume I.
8. Physics Part – 1 : Resnick and Halliday.

GOVT. BILASA GIRLS' P.G. COLLEGE BILASPUR(C.G.)

Session 2021-22

B.Sc. MATHEMATICS SEMESTER :I

PAPER : CALCULUS AND ALGEBRA -I

Max. Marks: 80;Min.Marks:28   **Hours 45;Credit-3**

UNIT I $\varepsilon-\delta$ Definition of the limit of a function. Continuity and classification of Discontinuities. Differentiability, Successive differentiation, Leibnitz theorem,

UNIT II Maclaurin's and Taylor's series expansions , Asymptotes, Curvature, Tracing of a curves in cartesian and polar coordinates.

UNIT III De Moivres theorem and its applications,Direct and inverse circular and hyperbolic functions,Logarithm of a complex quantity,Expansion of Trignometric functions.

UNIT IV Relation between the roots and coefficients of general polynomial equations in one variable,Transformation of equations,Descarte's rule of signs,Solutions of cubic equatios(Cardons method),Biquadratic equation.

UNIT V Vector differentiation and Vector integration, Directional derivatives, Gradient, Divergence , & Curl , Solenoidal and Irrotational vector.

REFERENCES:

1. Gorakh Prasad: Differential Calculus, Pothishalas Pvt Ltd, Allahabad.

2. Khalil Ahmad: Text Book of Calculus, World Edu. Pub., 2012. International (P) Ltd. Pub.

3. I. N. Herstein: Topics in Algebra, Wiley; 2nd edition (June 20, 1975).

4. P.B. Bhattacharya, S. K. Jain and S. R. Nagpaul: First course in Abstract Algebra.

5. K. B. Datta: Matrix and Linear Algebra.

6. J. Finkbecner: Matrix theory.

7. S. Singh, Modern Algebra, Vikas Publ. House, India.

8. Shanti Narayan : Differential Calculus, S.Chand Co. Ltd., Delhi,

9. Trignometry:S.L.Loney, Macmillam Pvt.Ltd.

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GOVT. BILASA GIRLS' P.G. COLLEGE BILASPUR (C.G.)

COMPUTER SCIENCE
Session 2021-22
B.Sc. Part I

Semester-I

Computer Fundamental& PC Packages

Unit – I

Basic of Computer

What is Computer? Introduction to Computing, History of Computer, Application and issues of Computer, Components of Computer; Input device, Output Devices, System Unit, Storage Devices, Connectivity, Video ports, USB port, all other Ports.

Unit – II

Processing Unit

Processor Building Blocks; Control Unit, Arithmetic Logic unit, Register unit, comparison of personal computer processors, processor for mini, mainframe, Large and Super computers, Examples of Various processor and their families, Category of processor on basis of word length, working of processor and Execution process machine cycle system Clock.

Unit –III

Memory and I/O/Devices

Types of memory: RAM, cache, ROM, flash memory, CMOS, Cloud Storage, Optical Discs; CDs, DVDs, memory Hierarchy Input Devices keyboard, Mouse, Trackball, Touchpad, pointing, Stick, and other memory output Devices; LCD & Plasma Monitors, other Monitors Prints: Nonimpact, Ink-Jet, Photo, Laser printer, plotters, Speakers, Headphones and Ear-buds, Data projectors, Interactive whiteboards.

Unit- IV

MS WINDOWS 7 AND MS WORD

Installing WINDOWS, Basic Element of WINDOWS, Working with windows, connecting to the Internet: Dial –up Connections, Broadband Connections, Installing New hard ware & printer, Installing & Removing Software, Power Setting, MS Word: Menus, shortcuts, Document types, working with Document types, Working with Document: Function of tool bar and menu bar. MS power point: Creating new Presentation templates, setting background, Function of Tool Bar and Menu bar, Inserting pictures, Movies, tables, etc into the presentation, Setting Animation& Transition effect, Adding audio and video, Printing Handouts, Generating standalone presentation viewer.

Unit – V

MS Excel and MS Access:

Introduction :- Spreadsheet & its Applications, & Toolbars & icons, Shortcuts, Working with spreadsheet, Computing data Formula, Formatting Spreadsheet, Worksheet: Sheet Formatting & style background, Graphs, printing, worksheet, MS Access: Database concepts: Tables, Queries, Forms, Reports, Opening & Saving database file: Creating Tables, Table Design, Indexing, Entering Data, Importing data, Creating Queries: SQL statement, setting Relationship, Forms: GUl, Form, Creating& Printing reports.

Text Books:-

1. Computer Science: an overview, Brook shear J.G. pearson Education.
2. Fundamental of Computer Raja Raman V..Prentic Hall of India New Delhi.
3. Comdex Computer Course Kit (Windows 7 with office 2010), Gupta Vikas, Dreamtech Publication.
4. Mastering MS Office 2000 professional Edition by Courter,BPB publication.
5. MS Office 2000 Training Guide by Maria, BPB Publication .
6. MS Office Complete by SYBEX.

Reference Book:-

1. PC Upgrade & Repair Black Book by Ron Gilster.
2. Fundamentals of Computers & Information Technology, A. Jaiswal, Dreamtech press.

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Govt. Bilasa Girls P.G. College, Bilaspur(C.G.)

Session: 2021-22

BIOTECHNOLOGY
B. Sc. First Semester
(Fundamentals of Biotechnology, Microbiology & Bioinformatics)
THEORY: Lectures – 45 Hours / 68-70 Periods

Max. Marks – 60
Passing marks - 21
Time of Exam. – 2.5 Hrs.

Maximum Marks: 75
Internal assessment marks: 15
Term end examination marks: 60

(9 Hours/14 Periods)

Unit – 1 Introduction of Biotechnology:

Concept, History, Objective & Scope. Past, Present and future of biotechnology. Eminent biotechnologist (Robert Koch, Edwerd Jenner, Louis Pasteur, Cesar Milstein) and their contribution. Status of Biotechnology in India. Germ theory of disease.

(9 Hours/14 Periods)

Unit – 2 Introduction of Microbiology:

Microbiology introduction, history and its scope. General features & Classification of virus, bacteria & fungi. Bacterial growth and nutrition. Staining - simple and differential. Sterilization methods- Physical and Chemical.

(9 Hours/14 Periods)

Unit – 3 Bacterial reproduction and Recombination:
Mode of asexual reproduction. Transformation (Griffith concept & mechanism); Transduction-types & mechanism, Lytic & Lysogenic cycles of Bacteriophage (T_4 & λphage). Conjugation: types and mechanism.

(9 Hours/14 Periods)

Unit – 4 Applied Microbiology:
Food Production (Alcohol, Vinegar), Food spoilage, food preservation and Food borne diseases, Food and Dairy Microbiology: production of cheese, yogurt, butter milk. Microbial health food (single cell protein & edible mushroom).

(9 Hours/14 Periods)

Unit – 5 Bioinformatics:
An overview, introduction and scope of bioinformatics. Kind of data used, information of biomolecules basic structural organization of nucleic acids (DNA and RNA) Biological databases, Types of databases (Entrez, sequence retrieval system), Sequence alignment.

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Suggestive Books:
1. General microbiology; Vol I & II, Powar C. B. and Daginawala H. I., Himalaypub.house, Bombay.
2. A textbook of Microbiology; Dubey&Maheshwari.
3. Microbiology: An Introduction; G. Tortora, B. Funke, C. Benjamin Cummings.
4. Biotechnology; B.D. Singh
5. Introduction to Bioinformatics; T K Atwood and D J Parry-Smith; Pearson Education Ltd

Signature of Convener & Members, Board of Studies:

Govt. Bilasa Girls P.G. College, Bilaspur(C.G.)
BIOTECHNOLOGY
First Semester
Laboratory work

1. Preparation of laboratory Glass wares (Chemical washing, cleaning and drying) and Preparation of culture media (Liquid & solid).

2. Microscopy- Different parts of compound microscope. Handling and care of compound microscope

3. Handling and care of laboratory equipments - Autoclave, Hot air oven, Incubator, pH meter, High speed centrifuge, Laminar air flow.

4. Observation of microorganisms - Bacteria, Cyanobacteria Protozoa, Fungi, Yeasts, and Algae from natural habitat.

5. Observation of bacterial motility – Hanging drop

6. Staining - Simple, Differential staining.

7. Aseptic transfer techniques – types – slant to slant, broth to broth, broth to agar

8. Isolation of bacteria by spread plate, streak plate and pour plate method

9. Data retrieval using Biological databases (GenBank, SwissProt, PDB)

Scheme of Practical Examination:
- ❖ Schedule of Examination – In Second semester only [CCBT-01+CCBT-02]
- ❖ Total Marks - 50
- ❖ Marks distribution –
  - Lab. Task - 30 marks[15 from each course-CCBT-01 & CCBT-02]
    Question of 20 marks - [two questions (10+5)] from course
    Question of 20 marks - [two questions (10+5)] from course
  - Spotting-5 spots -10 marks [at least two spots from each course [CCBT-01 & CCBT-02]

  - Viva-voce - 05 marks
  - Sessional - 05 marks

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Signature of Members, Board of Studies:

GOVT. BILASA GIRLS' P.G. (AUTO.) COLLEGE
BILASPUR (C.G)
FOUNDATION COURSE
ENGLISH LANGUAGE
SYLLABUS 2021-2022

CLASS: B.A./B.SC/B.COM/B.SC. (H.Sc.)/BCA/BBA

SEMESTER- II

Max. M - 80

Min. M – 29

UNIT-I TEN QUESTIONS TO BE SET (one from each chapter) AND FIVE TO BE ATTEMPTED

LESSONS   5 X 4 = 20

1. Where the Mind is without Fear – Rabindranath Tagore
2. The Ideals of Indian Art – K.BharathaIyer
3. The Wonder that was India- A.L. Basham
4. The Heritage of Indian Art – KapilaVatsyayan
5. Life in Vedic Literature – Krishna Chaitany
6. The Ramayana and the Mahabharata
7. Freedom Movement in India – Sudhir Chandra

UNIT-II COMPREHENSION- Unseen Passage   10

UNIT-III COMPOSITION – PARAGRAPH WRITING

     (Four to be set one to be attempted)   10

UNIT-IV   LETTER WRITING (with internal choice)

- Formal letter   05
- Informal letter   05

UNIT-V A. LANGUAGE SKILLS BASED ON TEXT BOOK: 10

     Synonyms, Antonyms, Match the column, suffix and prefix

     B. GRAMMAR(25 to be set and 20 to be attempted)   20

- ArticlesandDeterminers
- The Tense forms
- Verbs
- Conditional Sentences
- Modals

BOOK: ENGLISH LANGUAGE AND INDIAN CULTURE – MADHYA PRADESH HINDI GRANTH ACADEMY.

NEW CURRICULUM OF B.Sc. CHEMISTRY
SEMESTER II (2021-2022)
MM-60, HOURS-45, CREDIT-3

The new curriculum will comprise of one theory paper OF 60 marks in each semester and practical work of 50 mark per year. The curriculum is as per the UGC norms & conforming to the directives of the Govt. of Chhattisgarh.

UNIT-I
A. s-BLOCK ELEMENTS
General concepts on group relationships and gradation properties, Comparative study, salient features of hydrides, solvation & complexation tendencies including their function in biosystems and introduction to alkyl & aryls, Derivatives of alkali and alkaline earth metals

B. p-BLOCK ELEMENTS
General concepts on group relationships and gradation properties. Halides, hydrides, oxides and oxyacids of Boron, Aluminum, Nitrogen and Phosphorus. Boranes, borazines, fullerenes, graphene and silicates, interhalogens and pseudohalogens.

C. CHEMISTRY OF NOBLE GASES
Chemical properties of the noble gases, chemistry of xenon, structure, bonding in xenon compounds

D. THEORETICAL PRINCIPLES IN QUALITATIVE ANALYSIS (H2S SCHEME)
Basic principles involved in the analysis of cations and anions and solubility products, common ion effect. Principles involved in separation of cations into groups and choice of group reagents. Interfering anions (fluoride, borate, oxalate and phosphate) and need to remove them after Group II.

UNIT-II CHEMISTRY OF ALIPHATIC HYDROCARBONS
A. Carbon-Carbon sigma (σ) bonds
Chemistry of alkanes: Formation of alkanes, Wurtz Reaction, Wurtz-Fittig Reaction, Free radical substitutions: Halogenation-relative reactivity and selectivity.

B. Carbon-Carbon Pi (π) bonds:
Formation of alkenes and alkynes by elimination reactions, Mechanism of E1, E2, E1cb reactions. Saytzeff and Hofmann eliminations.

Reactions of alkenes: Electrophilic additions and mechanisms (Markownikoff/ Anti - Markownikoff addition), mechanism of oxymercuration-demercuration, hydroboration-oxidation, ozonolysis, reduction (catalytic and chemical), syn and anti-hydroxylation (oxidation). 1,2-and 1,4-addition reactions in conjugated dienes and, Diels-Alder reaction; Allylic and benzylic bromination and mechanism, e.g. propene, 1-butene, toluene, ethyl benzene.

Reactions of alkynes: Acidity, Electrophilic and Nucleophilic additions. Hydration to form carbonyl compounds, Alkylation of terminal alkynes.

UNIT-III AROMATIC HYDROCARBONS

Aromaticity: Hückel's rule, aromatic character of arenes, cyclic carbocations/ carbanions and heterocyclic compounds with suitable examples. Electrophilic aromatic substitution: halogenation, nitration, sulphonation and Friedel-Craft's alkylation/acylation with their mechanism. Directive effects of the groups.

UNIT-IV

A. LIQUID STATE CHEMISTRY

Intermolecular forces, magnitude of intermolecular force, structure of liquids, Properties of liquids, viscosity and surface tension.

B. COLLOIDS & SURFACE CHEMISTRY

Classification, Optical, Kinetic and Electrical Properties of colloids, Coagulation, Hardy Schulze law, flocculation value, Protection, Gold number, Emulsion, micelles and types, Gel, Syneresis and thixotrophy, Application of colloids.

Physical adsorption, chemisorption, adsorption isotherms (Langmuir and Freundlich). Nature of adsorbed state. Qualitative discussion of BET.

C. SOLID STATE CHEMISTRY

Nature of the solid state, law of constancy of interfacial angles, law of rational indices, Miller indices, elementary ideas of symmetry, symmetry elements and symmetry operations, qualitative idea of point and space groups, seven crystal systems and fourteen Bravais lattices; X-ray diffraction, Bragg's law, a simple account of rotating crystal method and powder pattern method.

Crystal defects.

UNIT-V

A. CHEMICAL KINETICS

Rate of reaction, Factors influencing rate of reaction, rate law, rate constant, Order and molecularity of reactions, rate determining step, Zero, First and Second order reactions, Rate and Rate Law, methods of determining order of reaction, Chain reactions. Temperature dependence of reaction rate, Arrhenius theory, Physical significance of Activation energy, collision theory, demerits of collision theory, non mathematical concept of transition state theory.

B. CATALYSIS

Homogeneous and Heterogeneous Catalysis, types of catalyst, characteristic of catalyst, Enzyme catatysed reactions, Micellar catatysed reactions, Industrial applications of Catalysis

REFERENCE BOOKS:

1. Lee, J. D. Concise Inorganic Chemistry ELBS, 1991.

2. Douglas, B.E. and McDaniel, D.H. Concepts & Models of Inorganic Chemistry Oxford, 1970

3. Atkins, P.W. & Paula, J. Physical Chemistry, 10th Ed., Oxford University Press, 2014.

4. Day, M.C. and Selbin, J. Theoretical Inorganic Chemistry, ACS Publications, 1962.

5. Rodger, G.E. Inorganic and Solid State Chemistry, Cengage Learning India Edition. 2002.

6. Puri, B. R., Sharma, L. R. and Kalia, K. C., Principles of Inorganic Chemistry, Milestone Publishers/ Vishal Publishing Co.; 33rd Edition 2016

7. Madan, R. D. Modern Inorganic Chemistry, S Chand Publishing, 1987.

8. Morrison, R. N. & Boyd, R. N. Organic Chemistry, Dorling Kindersley (India) Pvt. Ltd.(Pearson Education).

9. Finar, I. L. Organic Chemistry (Volume 1), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

10. Finar, I. L. Organic Chemistry (Volume 2: Stereochemistry and the Chemistry of Natural Products), Dorling Kindersley (India) Pvt. Ltd. (Pearson Education).

11. Eliel, E. L. &Wilen, S. H. Stereochemistry of Organic Compounds, Wiley: London, 1994.
12. Kalsi, P. S. Stereochemistry Conformation and Mechanism, New Age International, 2005.

13. McMurry, J.E. Fundamentals of Organic Chemistry, 7th Ed. Cengage Learning India Edition, 2013.

14. Organic Chemistry, Paula Y. Bruice, 2nd Edition, Prentice-Hall, International Edition (1998).

15. A Guide Book of Reaction Mechanism by Peter Sykes.
16. Atkins, P. W. & Paula, J. de Atkin's Physical Chemistry 10th Ed., Oxford University Press (2014).
17. Ball, D. W. Physical Chemistry Thomson Press, India (2007).

18. Castellan, G. W. Physical Chemistry 4th Ed. Narosa (2004).

19. Mortimer, R. G. Physical Chemistry 3rd Ed. Elsevier: NOIDA, UP (2009).

20. Engel, T. & Reid, P. Physical Chemistry 3rd Ed. Pearson (2013).

21. Puri, B.R., Sharma, L. R. and Pathania, M.S., Principles of Physical Chemistry, Vishal Publishing Co., 47th Ed. (2016).

22. Bahl, A., Bahl, B.S. and Tuli, G.D. Essentials of Physical Chemistry, S Chand Publ. (2010).

23. Rakshit P.C., Physical Chemistry, Sarat Book House Ed. (2014).

24. Singh B., Mathematics for Chemist, Pragati Publications.

LABOBATORY COURSE

INORGANIC CHEMISTRY

A. Semi-micro qualitative analysis (using H2S or other methods) of mixtures - not more than four ionic species (two anions and two cations, excluding interfering, insoluble salts) out of the following:

Cations : NH4+, Pb2+, Bi3+, Cu2+, Cd2+, Fe3+, Al3+, Co2+, Ni2+, Mn2+, Zn2+, Ba2+, Sr2+, Ca2+, Na+ Anions : CO32- , S2-, SO32-, S2O32-, NO2-, CH3COO-, Cl-, Br-, I-, NO3-, SO42-

(Spot tests may be carried out wherever feasible)

• Simple distillation of ethanol-water mixture using water condenser.

• Distillation of nitrobenzene and aniline using air condenser.

ii. Sublimation

• Camphor, Naphthalene, Phthalic acid and Succinic acid.

iii. Decolorisation and crystallization using charcoal.

• Decolorisation of brown sugar with animal charcoal using gravity filtrations crystallization and decolorisation of impure naphthalene (100 g of naphthalene mixed with 0.3 g of Congo red using 1 g of decolorizing carbon) from ethanol.

7. Qualitative Analysis
Detection of elements (N, S and halogens) and functional groups (Phenolic, Carboxylic, Carbonyl, Esters, Carbohydrates, Amines, Amides, Nitro and Anilide) in simple organic compounds.

PHYSICAL CHEMISTRY

1. Surface tension measurements.

• Determine the surface tension by (i) drop number (ii) drop weight method.

• Surface tension composition curve for a binary liquid mixture.

2. Viscosity measurement using Ostwald's viscometer.

• Determination of viscosity of aqueous solutions of (i) sugar (ii) ethanol at room temperature.

• Study of the variation of viscosity of sucrose solution with the concentration of solute.

• Viscosity Composition curve for a binary liquid mixture.

3. Chemical Kinetics

• To determine the specific rate of hydrolysis of methyl/ethyl acetate catalysed by hydrogen ions at room temperature.

• To study the effect of acid strength on the hydrolysis of an ester.

• To compare the strengths of HCl & H_2SO_4 by studying the kinetics of hydrolysis of ethyl acetate.

4. Colloids

• To prepare colloidal solution of silver nanoparticles (reduction method) and other metal nanoparticles using capping agents.

Note: Experiments may be added/ deleted subject to availability of time and facilities

PRACTICAL EXAMINATION
5HRS
M.M. 50

Three experiments are to be performed

1. Inorganic Mixture Analysis, four radicals two basic & two acid (excluding insoluble, Interfering & combination of acid radicals) OR Two Titrations (Acid-Bases,Redox and Iodo/Iodimetry) 12 marks

2. Detection of functional group in the given organic compound and determine its MPt/BPt.

8 marks

O R

Crystallization of any one compound as given in the prospectus along with the determination of mixed MPt.

O R

Decolorisation of brown sugar along with sublimation of camphor/ Naphthlene.

3. Any one physical experiment that can be completed in two hours including calculations.

14 marks

4. Viva 10 marks

5. Sessionals 06 marks

In case of Ex-Students two marks will be added to each of the experiments

REFERENCE TEXT:

1. Mendham, J., A. I. Vogel's Quantitative Chemical Analysis 6th Ed., Pearson, 2009.

2. Ahluwalia, V. K., Dhingra, S. and Gulati, A. College practical Chemistry, University Press.

3. Mann, F.G. & Saunders, B.C. Practical Organic Chemistry, Pearson Education (2009)

4. Furniss, B.S.; Hannaford, A.J.; Smith, P.W.G.; Tatchell, A.R. Practical Organic Chemistry, 5th Ed., Pearson (2012)

5. Khosla, B. D.; Garg, V. C. & Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co.: New Delhi (2011).

6. Garland, C. W.; Nibler, J. W. & Shoemaker, D. P. Experiments in Physical Chemistry 8th Ed.; McGraw-Hill: New York (2003).

7. Halpern, A. M. & McBane, G. C. Experimental Physical Chemistry 3rd Ed.; W.H. Freeman & Co.: New York (2003).

Core Course -CCB – 02

[*Cytology, Genetics and Molecular Biology*]

(Credits: Theory-3, Practicals-2)
THEORY: Lectures – 45 Hours / 68-70 Periods

Unit 1: Cytology: Plant cell structure(09 Hours/ 14 Periods)
The Cell Theory; Prokaryotic and eukaryotic cells; Cell size and shape; Ultra structure- Plant Cell componentsCell Organelles – Mitochondria, Chloroplast, ER, Golgi body & LysosomesPeroxisomes and Glyoxisomes (Structure, Function and Biogenesis). Cell Membrane and Cell Wall – Chemical composition, latest concept of structure and function.

Unit 2: Cytology: Nucleus and Cell Cycle:(09 Hours/ 14 Periods)
Nucleus: Nuclear Envelope- structure of nuclear pore complex; chromatin; molecularorganization, DNA packaging in eukaryotes, euchromatin and heterochromatin, nucleolusand ribosome structure (brief).DNA as aGenetic material: Miescher, Watson and Crick Experimental evidences. Overview of Cell cycle, Mitosis and Meiosis; Molecular controls.

Unit 3: Genetics -I:(09 Hours/ 14 Periods)
Brief life history of Mendel, Terminologies; Laws of Inheritance; Modified Mandelian Ratios: 2:1- lethal Genes; 1:2:1- Co- dominance, incomplete dominance; 9:7; 9:4:3; 13:3; 12:3:1.Cytoplasmic Inheritance: Shell Coiling in Snail, Kappa particles in Paramecium, leaf variegation in Mirabilis Male sterility.Linkage: concept &history, complete & incomplete linkage, bridges experiment, coupling & repulsion, recombination frequency, linkage maps based on two and three factor crosses. Crossing over: concept and significance.

Unit 4: Genetics -II: Mutations and Chromosomal Aberrations:(09 Hours/ 14 Periods)
Structural chromosomal changes: Deletions, Duplications, Inversions & Translocations. Numerical chromosomal changes: Euploidy, Polyploidy and Aneuploidy; Mutation – concept and molecular basis. Types of mutations, effects of physical & chemical mutagens.Role of mutation and polyploidy in evolution.

Unit 5: Molecular biology:(09 Hours/ 14 Periods)
DNA structure. typesof DNA, DNA replication (Prokaryotes and eukaryotes). Transcription (Prokaryotes and Eukaryotes); Types of structures of RNA (mRNA, tRNA, rRNA), RNA polymerase-various types; Translation (Prokaryotes and eukaryotes), genetic code. Regulation of gene expression: Prokaryotes: Lac operon and Tryptophan operon ; and in Eukaryotes.

> **Practical: Lab work (2 Credits=30 Hours /45 Periods)**

Suggested Readings

1. Karp, G. 2010. Cell and Molecular Biology: Concepts and Experiments. 6th Edition.John Wiley & Sons.Inc.
2. De Robertis, E.D.P. and De Robertis, E.M.F. 2006.Cell and Molecular Biology.8[th]edition. Lippincott Williams and Wilkins, Philadelphia.
3. Cooper, G.M. and Hausman, R.E. 2009. The Cell: A Molecular Approach. 5[th]edition.ASM Press & Sunderland, Washington, D.C.; Sinauer Associates, MA.
4. Becker. W.M., Kleinsmith. L.J., Hardin. J. and Bertoni, G. P. 2009.The World ofof the Cell.7th edition. Pearson Benjamin Cummings Publishing. San Francisco.

Signature of Convener & Members, Board of Studies:

Laboratory work
2021-2022
(B.Sc. – I & II semester)
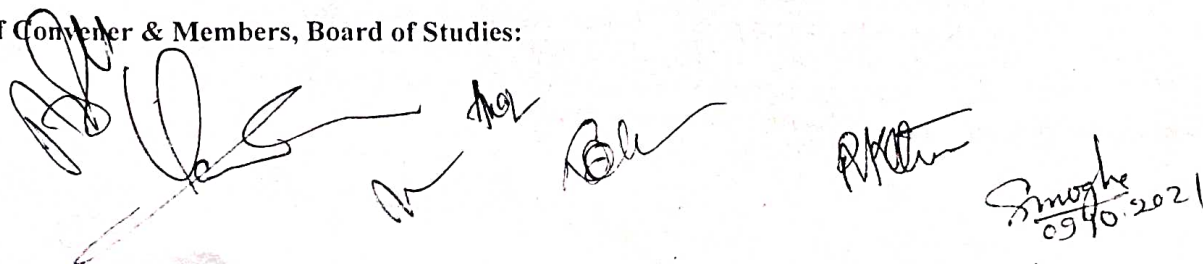## (CORE COURSE – CCB- 01 & 02)

TIME: 3 Hrs.   **Marks – 50**

1.	Gram Staining of Bacteria / Plant disease symptoms	04
2.	Algae / Fungi	07
3.	Bryophyte / Pteridophyta 07	
4.	Gymnosperm -----	07
5.	Cytology / Genetics	05
6.	Spots	10
7.	Viva – Voce	05
8.	Sessional	05

Suggested Laboratory Exercises

- EMS / Models of Viruses – T phage and TMV.
- Study of different forms of Bacteria, Gram staining of Bacteria.
- Preparation of temporary slides and study of permanent slides of Algae, mention in syllabus.
- Preparation of temporary slides from culture and study of permanent slides of Fungi mention in syllabus.
- Study of Plant disease symptoms and preparation of suitable slides of infected area of mention in syllabus.
- Lichen: Study of specimens and permanent slides of Folliose, Crustose, and Fruticose Lichens.
- Mycorrhiza :Ectomycorrhiza and endomycorrhiza (photographs).
- Monographic study of Bryophytes mentions in syllabus.
- External and internal structure of early land plants: Rhynia&Cooksonia (Photographs).
- Preparation of double stained temporary slides and study of permanent slides of Pteridophyta mentioned in syllabus.
- Preparation of double stained temporary slides and study of permanent slides of Gymnosperms mentioned in syllabus.
- Study different types of Plant cells.
- Techniques of different staining methods of Cell organelles.
- Study different stages of Mitosis.
- Study different stages of Meiosis.
- Exercises on Genetics (Mendelian ratios and Test crosses).
- Karyotypes of Chromosomes.
- Study of bar bodies.
- Study of Polytene Chromosomes and lampbrush chromosome.

Signature of Convener & Members, Board of Studies:

Govt. Bilasa Girls P.G. College Bilaspur (C.G.)

Session 2021-22
B.Sc. Semester II
SUBJECT ZOOLOGY
Paper (Pass Course)
(VERTEBRATES, EMBRYOLOGY, ECOLOGY, & ENVIRONMENTAL BIOLOGY)
LECTURES:45

Max. Marks: 60
Min. Pass Marks :21

Unit:I

1. Classification of Chordates uptoorders.
2. Protochordata-Type study -Amphioxus.
3. A comparative account of Petromyzon and Myxine.
4. Fishes-Skin & Scales, migration in fishes, Parental care infish.

Unit:II

1. Amphibia-Parental care and Neoteny.
2. Reptilia- Poisonous & Non-poisonous Snakes, Poison apparatus, snake venom
3. Birds- Flight Adaptation, Migration, and Perching mechanism, Discuss-Birds are glorified reptiles.
4. Mammals-Comparative account of Prototheria, Metatheria, Eutheria and Affinities.
5. Aquatic Mammals and their Adaptations.

Unit:III

1. Structure of gamete and Types of eggs
2. Fertilization
3. Cleavage
4. Development of Frog up to formation of three germlayers,
5. Development of Chick up to formation of three germ layers,
6. Embryonic induction, Differentiation and Regeneration.
7. Parthenogenesis
8. Placenta in mammals.

Unit:IV

1. Aims and scopes of ecology.
2. Major ecosystems of the word brief introduction.
3. Population characteristics and regulation of densities.
4. Communities and Ecosystem.
5. Biogeochemical cycle.
6. Ecological succession.

Unit:V

1. Laws of limiting factors.
2. Food chain in a fresh water ecosystem.
3. Energy flow in ecosystem –Trophic levels.
4. Conservation of Natural resources.
5. Environmental impact Assessment
6. Air and water pollution.

SUGGESTED READINGS

1. Young, J. Z. (2004). *The Life of Vertebrates*. III Edition. Oxford university press.
2. Pough H. *Vertebrate life*, VIII Edition, Pearson International.
3. Darlington P.J. *The Geographical Distribution of Animals*, R.E. Krieger Pub. Co.
4. Hall B.K. and Hallgrimsson B. (2008). *Strickberger's Evolution*. IV Edition. Jones and Bartlett Publishers Inc.
5. Gilbert, S. F. (2010). *Developmental Biology*, IX Edition, Sinauer Associates, Inc., Publishers, Sunderland, Massachusetts, USA.
6. Balinsky B. I. and Fabian B. C. (1981). *An Introduction to Embryology*, V Edition, International Thompson Computer Press.
7. Kalthoff (2008). *Analysis of Biological Development*, II Edition, McGraw-Hill Publishers.
8. Lewis Wolpert (2002). *Principles of Development*. II Edition, Oxford University Press
9. Colinvaux, P. A. (1993). *Ecology*. II Edition. Wiley, John and Sons, Inc.
10. Krebs, C. J. (2001). *Ecology*. VI Edition. Benjamin Cummings.
11. Odum, E.P., (2008). *Fundamentals of Ecology*. Indian Edition. Brooks/Cole
12. Robert Leo Smith Ecology and field biology Harper and Row publisher
13. Ricklefs, R.E., (2000). *Ecology*. V Edition. Chiron Pres

PRACTICAL (VERTEBRATES.)

1. Protochordata
Balanoglossus, Herdmania, Branchiostoma, Colonial Urochordata
Sections of *Balanoglossus* through proboscis and branchiogenital regions
Sections of *Amphioxus* through pharyngeal, intestinal and caudal regions
Permanent slide of *Herdmania* spicules

2. Agnatha
Petromyzon

3. Fishes
Sphyrna, Pristis, Torpedo, Chimaera, Notopterus, Mystus, Heteropneustes, Labeo, Exocoetus, Echeneis, Anguilla, Tetrodon/ Diodon, Anabas, Flat fish

4. Amphibia
Ichthyophis/Ureotyphlus, Necturus, Bufo, Hyla, Alytes, Salamandra

5. Reptiles
Chelone, Trionyx, Hemidactylus, Varanus, Uromastix, Chamaeleon, Draco, Ophiosaurus, Bungarus, Vipera, Naja, Hydrophis, Zamenis, Crocodylus
Key for Identification of poisonous and non-poisonous snakes

6. Aves
Study of six common birds from different orders
Types of beaks and claws

7. Mammalia
Sorex, Bat (Insectivorous and Frugivorous), *Funambulus, Loris, Herpestes, Hemiechenis*

PRACTICAL (EMBRYOLOGY)
1. Study of whole mounts and sections of developmental stages of frog through permanent slides: Cleavage stages, blastula, gastrula, neurula, tail-bud stage, tadpole (external and internal gill stages)
2. Study of whole mounts of developmental stages of chick through permanent slides: Primitive streak (13 and 18 hours), 21, 24, 28, 33, 36, 48, 72, and 96 hours of incubation (Hamilton and Hamburger stages)
3. Study of different types of placenta

PRACTICAL(ECOLOGY)
1. Estimation of population density, percentage frequency, relative density.
2. Analysis of producers and consumers in grassland/aquatic Ecosystem.

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Session 2021-2022
Zoology Practical
B.Sc. Semester I +II
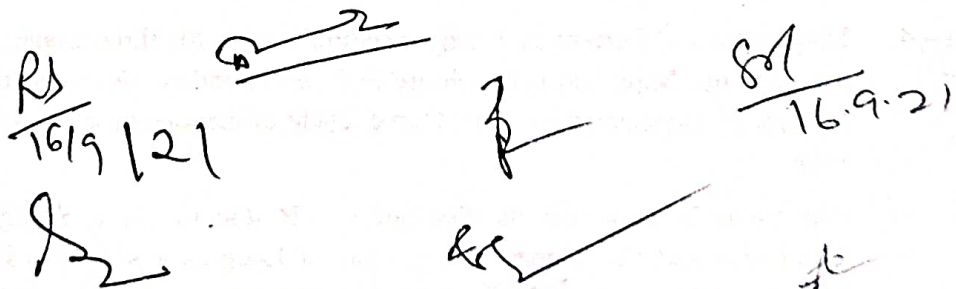Scheme of Practical Exam. (M.M. 50)
Time; 3 Hrs.

The practical work will, in general be based on the syllabus prescribed in theory and the candidates will be required to show knowledge of the following:-
1. Dissection of Earthworm, Cockroach, Palaemon and Pila
2. Minor dissection—appendages of Prawn & hastate plate, mouth parts of insects, radulla of Pila.(Alternative methods: By Clay/Thermacol/drawing/Model etc.)
3. Adaptive characters of Aquatic, terrestrial, aerial and desertanimals.
4. Museum specimen invertebrate
5. Slides- Invertebrates, frog embryology, Chick embryology and cytology,

Scheme ofPracticalExam　　　　　　　　**Time: 3hrs**

1.Major Dissection　　　　　　6Marks
2.Minor Dissection　　　　　　03Marks
3.Spots-8 (Slides-4, Specimens-4)　16Marks
4.Excersice basedon embryology　04 Marks
5.Cytological Preparation　　　04Marks
6.Ecology　　　　　　　　　　08Marks
7. Viva　　　　　　　　　　　04Marks
8. Sessional　　　　　　　　　05Marks
　　　　　　　　　　　　　　Total 50

B.Sc. Part – I
Paper – II (Second Semester)
ELECTRICITY, MAGNETISM AND ELECTROMAGNETIC THOERY

Unit – I   Repeated integrals of a function of more than one variable, definition of a double and triple integral. Gradient of a scalar field and its geometrical interpretation, divergence and curl of a vector field, and their geometrical interpretation, line, surface and volume integrals flux of a vector field. Gauss's divergence theorem, Green's theorem and Stoke's theorem and their physical significance. Kirchoff's law, Ideal Constant – voltage and Constrant- current Sources. Thevenin theorem, Norton theorem, Superposition theorem. Reciprocity theorem and Maximum Power Transfer theorem.

Unit – 2   Coulomb's law in vacuum expressed in Vector forms, calculations of E for simple distributions of charges at rest, dipole and quadrupole fields. Work done on a charge in a electrostatic field expressed as a line integral, conservative nature of the electrostatic field. Relation between Electric potential and Electric field, torque on a dipole in a uniform electric field and its energy, flux of the electric field.

Gauss's law and its applications : E due to (1) an Infinite Line of Charge, (2) a Charged Cylindrical Conductor, (3) an Infinite Sheet oa Charges and Two Parallel Charged Sheets, capacitors, electrostatic field energy, force per unit area of the surface of a conductor in an electric field, conducting sphere in a uniform electric field.

Unit – 3   Dielectric constant, Polar and Non Polar dielectrics. dielectrics and Gauss's Law, Dielectric Polarization, Electric Polarization vector P, Electric displacement vector D. Relation between three electric vectors, Dielectric susceptibility and permittivity, Polarizability and mechanism of Polarization, Lorentz local field, Clausius Mossotti equation, Debye equation.

Ferroelectric and Paraelectric dielectrics, Steady current, current density J, non-steady currents and continuity equation, rise and decay of current in LR, CR and LCR circuits, decay constants, AC circuits, complex numbers and their applications in solving AC circuit problems, complex impedance and reactance, series and parallel resonance, Q factor, power consumed by an a AC circuit, power factor.

Unit – 4   Magnetization Current and magnetization vector M, three magnetic vectors and their relationship, Magnetic permeability and susceptibility, Diamagnetic, paramagnetic and ferromagnetic substances. B.H. Curve, cycle of magnetization and hysteresis, Hysteresis loss.

Biot-Savart's Law and its application : B due to (1) a Straight Current Carrying Conductor and (2) Current Loop. Current Loop as a Magnetic Dipole and its Dipole Moment (Analogy with Electric Dipole). Ampere's Circuital law (Integral and Differential Forms).

Unite - 5   Electromagnetic induction, Faraday's law, electromotive force, integral and differential forms of Faradya's law Mutual and self inductance, Transformers, energy in a static magnetic field. Maxwell's displacement current, Maxwell's equations, electromagnetic field energy density. The wave equation satisfied by E and B, Plane electromagnetic waves in vacuum, Poynting's vector.

TEXT AND REFERENCE BOOKS :

1.   Berkeley Physics Course, Electricity and Magnetism, Ed. E.M. Purcell (Mc Graw-Hill)

2.   Halliday and Resnik, Physics, Vol. 2

3.   D.G. Grifith, Introduction to Electrodynamics (Prentice - Hall of India).

4.   Raitz and Milford, Electricity and Magnetism (Addison - Wesley).

5.   A.S. Mahajan and A.A. Rangwala, Electricity and Magnetism (Tata Mc Graw-hill).

6.   A.M. Portis, Electromagnetic fields.

7.   Pugh & Pugh, Principles of Electricity and Magnetism (Addison-Wesley).

8.   Panotsky and Phillips, Classical Electricity and Magnetism (India Book House).

9.   S.S. Atwood, Electricity and Magnetism (Dover).

PRACTICALS
Minimum 16 (Eight from each group)
Experiments out of the following or similar experiments of equal standard

GROUP - A
1. Study of laws of parallel and perpendicular axes for moment of inertia.
2. Moment of inertia of Fly wheel.
3. Moment of inertia of irregular bodies by intertia table.
4. Study of conservation of momentum in two dimensional oscillations.
5. Study of a compound pendulum.
6. Study of damping of a bar pendulum under various mechanics.
7. Study of oscillation under a bifilar suspension.
8. Study of modulus of rigidity by Maxwell's needle.
9. Determination of Y.K. η . by Searl's apparatus.
10. To study the oscillation of a rubber band and hence to draw a potential energy curve from it.
11. Study of oscillation of a mass under different combinations of springs.
12. Study of torsion of wire (static and dynamic method).
13. Poisson's ratio of rubber tube.
14. Study of bending of a contilever or a beam.
15. Study of flow of liquids through capillaries.
16. Determination of surface tension of a liquid.
17. Study of viscosity of a fluid by different methods.

GROUP - B
1. Use of a vibration magnetometer to study a field.
2. Study of magnetic field B due to a current.
3. Measurement of low resistance by Carey-Foster bridge.
4. Measurement of inductance using impedance at different frequencies.
5. Study of decay of currents in LR and RC circuits.
6. Response curve for LCR circuit and response frequency and quality factor.
7. Study of waveforms using cathode-ray oscilloscope.
8. Characteristics of a choke and Measurement of inductance.
9. Study of Lorentz force.
10. Study of discrete and continuous LC transmission line.
11. Elementary FORTRAN programs, Flowcharts and their interpretation.
12. To find the product of two matrics.
13. Numerical solution of equation of motion.
14. To find the roots of quadratic equation.

TEXT AND REFERENCE BOOKS :

1. B. saraf et al Mechanical Systems (Vikas publishing House, New Delhi).
2. D.P. Khandelwal, A Laboratory Manual of Physics for Undergraduate classes (Vani Publication House, New Delhi).
3. C.G. Lambe Elements of statistics (Longmans Green and Co London New York, Tprpnto)
4. C. Dixon, Numerical analysis.
5. S. Lipsdutz and A Poe, schaum's outline of theory and problems of programming with Fortran (MC Graw-Hill Book Company, Singapore 1986).

GOVT. BILASA GIRLS' P.G. COLLEGE BILASPUR(C.G.)

Session 2021-22

B.Sc. MATHEMATICS

SEMESTER :II

PAPER : CALCULUS AND ALGEBRA-II

Max. Marks: 80;Min.Marks:28   Hours 45;Credit-3

UNIT I   Reduction formulae, Quadrature ,Rectification.

UNIT II   Differential equations of first order and first degree. Linear differential equations, Exact differential equations. First orderand higher degree equations, Geometrical meaning of differential equation. Orthogonal trajectories. Linear differential equations with constant coefficients.

UNIT III Linear differential equations of second order. Transformation of the equation by changing the dependent /independent variable, Method of variation of parameters, Ordinary simultaneous differential equations.

UNIT IV Mapping, Equivalence relations and patitions,Congruence modulo n. Definition of a group with examples and simple properties, Subgroup, Union and Intersection of a subgroup ,Generation of groups,Cyclic groups,Order of a group, Coset Decomposition. Lagrange's Theorem(only for finite group) and its consequences.

UNIT V   Homomorphim and Isomorphism, ,Kernel of a Homomorphism. Normal subgroup, Quotient group. Fundamental theorem of Homomorphism,The Isomorphism Theorem for groups.Definition with examples and Properties of ring.

REFERENCES:

1. Gorakh Prasad: Integral Calculus, Pothishalas Pvt Ltd, Allahabad.

2. Shanti Narayan: Integral Calculus, S. Chand & Co.

3.S.Balachandra Rao &H.R.Anuradha,DE with App and Programmes,Uni.Press,Hyderabad.

4. R.S. Senger, Ordinary Differential Equations with Integration, Prayal Publ. 2000.

5. D.A. Murray, Introductory Course in Differential Equations, Orient Longman (India),67

6.. E.A. Codington, An Introduction to Ordinary Differential Equations, P HI, 1961.

7. B.Rai, D.P.Choudhary,Ordinary Differential Equations, Narosa Publ. 2004,

Session 2021-22

GOVT. BILASA GIRLS' P.G. COLLEGE BILASPUR (C.G.)

Semester - IInd

PROGRAMMING METHODOLOGY WITH C

UNIT- I

Introduction to Program Concept.

Characteristics of Programming Various stages in Program Development, Design of Algorithms, Definition. Features of Algorithms, Criteria to be Followed by an Algorithm, Analysis of Algorithm, Analysis of Algorithm, Efficiency of Algorithm, Algorithm Complexity, Flow charts – Symbols, Rules for making Flow chart Pseudocodes and decision tables, Programming Techniques – Top down, Bottom up, structured programming and modular programming, merits, Demerits, and their Comparative study, Problem-solving Techniques, Step for problem – solving, using computer as a problem - solving Tool, Problem analysis.\

UNIT – II

Introduction to C PROGRAMME

Structure of C program, character set, C Tokens, keyword, identifiers, constants, variables, data types, Types of operators and expressions, Precedence of arithmetic operator Type conversion in expressions, Operators Precedence input and output Function in C Control Structure – if, If Else, Nesting of If Else, Else If ladder statement, switch statement, Conditional operator, GOTO, Statement Loop Introduction, while Do white, For Loop, jumps in Loop.

Unit III

Arrays, String & Function

Definition Initialization, characteristic One Two and Multidimensional Arrays, string – Introduction, working with String & standard Function –Introduction, Need for user defined Function, From of C Function, Return value and their types, Declaration, Prototypes, Category of function, function with arrays, call by value and feference, The Scope and lifetime of variables in Function.

Unit- IV

Structure, Union& Pointers

Declaration:- Initialization, Arrays of structure, Structure within Structure, Structure and Function Union Size of Structure , Bit Fields pointer –Introduction, Declaring and initializing Pointer Accessing a variable pointer expression. Pointer and arrays, pointer and character string Pointer and Function, pointer and structure , pointer to pointer

Unit – V

File management

Introduction , Defining and operating a file Closing a file , Streams and file types , file operator file I/O read, with and other standard function of file, random access to file, Dynamic memory Allocation, The preprocessor.

Text Book:-

1. LET US C, YeshwantKanetkar, BPB PUBLICATIONS.
2. The Complete Reference C Herbert Schilddt, Tata McGraw HILL.
3. PROGRAMMING IN ANSL C- by E. Balgurusamy- Tata McGraw HILL.
4. PROGRAMMINMG WITH C Byron Govfred, Tata McGraw HILL.

Reference Book:-

1. The "C" Programming Language, Briain W. Kenigham& Dennis Ritchie, Pearson.
2. Mastering "c" – Crain Bolon.
3. The Spirit of "c" Henrry Mulish, Herbert. L. Cooper.
4. Gottfried, Schaums Outline Series, "Programming with C" TMH Publications .
5. Peter Juliff, "Program design" PHL Publication.

Programming Lab in 'C' & PC Packages

List of C Programs.

1. Program to Find area and circumference of Circle.
2. Program to Find the simple interest.
3. Program to Convert temperature from degree centigrade to Fahrenheit.
4. Program to point Fibonacci series up to 100.
5. Program to find GCD& HCF of given Numbers using Recursion.
6. Program to find whether gives no is a prime no or not.
7. Program to display sum of series 1+1/2+1/3+…..+1/n.
8. Program to display series and find sum of 1+3+5+….+n.
9. Program to use betwise and operator between the two integers.
  Program to add two number using pointer.
  Program to find sum, subtraction, Multiplication & Transpose of Matrices.
  Program to reverse a number using pointer.
  Program to show input and output of a string.
  Program to find square of a number using function.
  Program to swap two number using function.
  Program to find factorial of a number using function.
  Program to show Table of a number using function.
  Program to show call by value.
  Program to show call by reference.
  Program to find largest of two number using Function.
  Program to Find Factorial of a number using recursion.
  Program to Find whether a string is palindrome of not.

PC- Package LAB:-

The Lab Exercise should be based on mswindows 7 of sharing version and ms office 2007 of higher version and comprises the theoretical paper as well as practical paper.

Section:-A

WINDOWS 7 :- Basic Elements of WINDOWS, My Computer, Sharing Devices, windows Explorer,Accessories: Entertainment, Communication, System Tools paint, Brush, Calculator, Calendar, Clock, Note pad, word pad, Etc., Control panel, Changing Color and Theme, Changing the Desktop Background, Screen Saver, Adjusting Display Settings, Adjusting Sound, Changing the Date and Time.

Section :- B

Introduction to MS word :- Menus, Shortcuts, Document types, Working with Document :Operating File –New &Existing, Saving file, Formatting page and Setting margins, Concerting file to different Formats – Importing Exporting Sending file other, Editing text document – Inserting, Deleting , Cut, Copy, paste, Undo, Redo, Find, Search, Replace, Using Tools bars, Ruler, -Using Icons, Using Help, Formatting, Document, Setting Font Styles, setting Paragraph style, Setting page Style, Setting.

Section – C

Introduction To MSpower point: Operating NewPresentation,Different Presentation templates, Setting Inserting picture, Movies, tables.

Section :- D

Introduction To MS Excel:- Introduction Spreadsheet & its Application, Operating Spreadsheet, Menus & Toolbars & Icons, Shortcuts, Working with Spreadsheet –Operating a file, Saving file saving, File Setting, Setting margins, Converting File to Different Formats – Importing, Computing Data- Setting Formula, Finding total in a Column of row, Mathematical operations, Formulas, Formatting Spreadsheet & printing worksheet.

Section – E

Introduction To MS Access:-Data base Concepts: Tables, Queries, Forms, Reports , Operating & Saving Database file Creating Table, Table Design, Indexing, Entering Data, Importing Data, Creating Queries SQL. Statements, Setting Relationship, Creating Forms: GUL, Form, Creating & Printing Reports.

Session: 2021-22

Govt. Bilasa Girls P.G. College, Bilaspur (C.G.)

BIOTECHNOLOGY
B. Sc. Second Semester
Biochemistry, Bioinstrumentation and Immūne-technology
THEORY: Lectures – 45 Hours / 68-70 Periods

Maximum Marks: 75
Internal assessment marks: 15
Term end examination marks: 60

Max. Marks – 60
Passing marks - 21
Time of Exam. – 2.5 Hrs.

Unit – 1: Concept and Structure of Biomolecules: (9 Hours/14 Periods)

Carbohydrates- Structure, classification and function of mono, oligo and polysaccharides. Amino acids (Structure & properties). Structure and classification of Proteins (Primary Secondary & Tertiory) & Lipids: (fatty acid & steroids).

Unit– 2: Concept & properties of Water & Enzymes   (9 Hours/14 Periods)

Structure interactions, water as solvent, proton mobility and acid- base reactions. pH and buffers. Enzymes: Concept, nomenclature, classification. Mechanism of enzyme action. Coenzyme and cofactors. Isozyme and inhibition of enzyme.

Unit –3: Biological Oxidation: (9 Hours/14 Periods)

Glycolysis, TCA, Glycogenolysis, Gluconeogenesis, Electron Transports system and Oxidative Phosphorylation. fatty acid oxidation (alpha & beta Fatty Acids). Decarboxylation and deamination of amino acids.

Unit – 4: Bio instrumentation: (9 Hours/14 Periods)

Principle of centrifugation, relative centrifugal force and other factors affecting sedimentation. Chromatography: principle and types (Partition, adsorption, ion exchange, exclusion and affinity chromatography), and its applications. Spectrophotometry: principle and types (UV and visible). Electrophoretic techniques: principle and types (agarose and polyacrylamide gel). Microscopy: principle & types (bright filed & dark filed).

Unit – 5: Basic Concept of Immune technology   (9 Hours/14 Periods)

Chemical nature of antigens, antigenic determinants, haptens, Immunoglobulin-class, structure and functions of Immunoglobulin. Antigen- Antibody Interactions: Antibody affinity and avidity, Cross reactivity. Precipitation reactions: in fluid and in gel, immune-electrophoresis. Agglutination reactions: hem-agglutination, bacterial agglutination, passive agglutination and agglutination-inhibition. Immunofluorescence techniques; ELISA and RIA.

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Suggestive Books:

1. Lehninger's principles of Biochemistry; Nelson and cox Harper's Biochemistry, Murray
2. Principles of Biochemistry; J.L. Jain
3. Biophysical Chemistry; Upadhyay and UpadhyayNath, Himalayan Publication.
4. Immunology; An Introduction; Ian R. Tizard, 4th Edition. Saunders college publishing.

Govt. Bilasa Girls P.G. College, Bilaspur (C.G.)
BIOTECHNOLOGY
Second Semester
Laboratory work

1. Qualitative tests for Carbohydrates: Molisch's test, Anthrone test, Fehling's test, Benedict's test, Picric acid test, Barfoed's test, Seliwanoff's test, Iodine test, Hydrolysis of Sucrose and Starch, Ozazone test.
2. Qualitative tests for Lipids: Solubility, Translucent spot tests, Test for Unsaturation, Salkowski reaction, Liebermann-Burchard reaction.
3. Qualitative tests for Protein: Ninhydrin reaction, Xanthoproteic reaction,
4. Nucleic acid: Diphenylamine test (DPA) for DNA and Orcinol test for RNA.
5. Estimation of protein by Biuret / Folin Lowry's method.
6. Separation and identification of amino acid mixture by Paper chromatography.
7. Separation and identification of aminoacid mixture by Thin Layer Chromatography.
8. Separation of DNA by Agarose gel electrophoresis.
9. Determination of blood grouping and Rh typing.
10. Detection of specific antigen by using ELISA technique.
11. Separation and characterization of lymphocytes from blood and demonstration of lymphocyte population.
12. Study of antigen and antibody reaction by immune-diffusion technique

Scheme of Practical Examination:

❖ Schedule of Examination – In Second semester only [CCBT-01+CCBT-02]
❖ Total Marks -   50
❖ Marks distribution –
   ▪ Lab. Task -   30 marks[15 from each course-CCBT-01 & CCBT-02]
      Question of 20 marks -   [two questions (10+5)] from course
      Question of 20 marks -   [two questions (10+5)] from course
   ▪ Spotting-5 spots -10 marks [at least two spots from each course [CCBT-01 & CCBT-02]

   ▪ Viva-voce -   05 marks
   ▪ Sessional -   05 marks

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Signature of Members, Board of Studies: