

Birsa Munda Tribal University,

Adarsh Nivasi Shala Campus,

Vavdi Road, Dist. Narmada

Rajpipla

**School of Science
(Bachelor in Zoology)**

1stYEAR

**Teaching Examination Scheme
&
Syllabus**

With Effect

June-2018



1st Year Syllabus

Sr. No.	Paper Code	Paper Name	Hrs./ Week	Marking scheme		Total
				External	Internal	
1	SCC 101 Z01	General Zoology-I	4	70	30	100
2	SCC 102 GCH	General Chemistry	4	70	30	100
3	SCC 103 GPH	General Physics	4	70	30	100
4	SCE 101 BES	Basic Environment Studies	3	70	30	100
5	SFC 101 ENG	English-I	3	70	30	100
6	SPR101 PRA	Practical Module-I	3	50	--	50
7	SPR 102 PRA	Practical Module-I	3	50	--	50
8	SPR 103 PRA	Practical Module-I	3	50	--	50
Total			27	500	150	650

2nd Year Syllabus

Sr. No.	Paper Code	Paper Name	Hrs./ Week	Marking scheme		Total
				External	Internal	
1	SCC 201 Z02	Zoology-II	4	70	30	100
2	SCC 202 Z03	Zoology-III	4	70	30	100
3	SCC 203 OAC	Organic and Analytical Chemistry	4	70	30	100
4	SCC 204IPC	Inorganic and Physical Chemistry	4	70	30	100
5	SFC 201 ENG	English-II	3	70	30	100
6	SPR 201 PRA	Practical Module-II	6	100	--	100
7	SPR 202 PRA	Practical Module-II	6	100	--	100
Total			31	550	150	700



3rd Year Syllabus

Sr. No	Paper Code	Paper Name	Hrs./ Week	Marking scheme		Total
				External	Internal	
1	SCC 301 Z04	Zoology-IV	4	70	30	100
2	SCC 302 Z05	Zoology-V	4	70	30	100
3	SCC 303 Z06	Zoology-VI	4	70	30	100
4	SCC 304Z07	Zoology-VII	4	70	30	100
5	SCC 305Z08	Zoology-VIII	3	70	30	100
6	SCC 306 PRO	Project Evaluation	2	70	30	100
7	SFC 307 ENG	English-III	3	70	30	100
8	SPR 301 PRA	Practical Module-III	09	200	--	200
Total			33	690	210	900



SCC 101 Z01 General Zoology		
Unit No.	Content	Hours
1	<p><u>Systematics Classification and Taxonomy</u></p> <ul style="list-style-type: none"> • Scopes and Branches of Zoology • Zoological Nomenclature • International Code • Cladistics 	20
2	<p><u>Classification and Taxonomy</u></p> <ul style="list-style-type: none"> • Protozoa • Porifera • Coelenterata • Platyhelminthes • Nematelminthes 	20
3	<p><u>Classification and Taxonomy</u></p> <ul style="list-style-type: none"> • Annelida • Arthropoda • Annelida • Arthropoda • Mollusca • Echinodermata • Hemichordata 	20
4	<p><u>Animal Physiology (with Special reference to Mammals)</u></p> <p><u>Blood Physiology</u></p> <ul style="list-style-type: none"> • Composition and Constituents of Blood • Blood Groups • Rh Factor in Man • Coagulation • Factors and Mechanism of Coagulation • Haemoglobin : Constituents and role in regulation 	20



5	<u>Genetics</u> <ul style="list-style-type: none">• Branches of Genetics• Theories of Biogenesis• Mendelian Genetics	20
6	<u>Economic Zoology</u> <ul style="list-style-type: none">• Apiculture• Sericulture• Poultry Farming	20



Reference Books

1. Modern Textbook of Zoology Invertebrates, R.L. Kotpal, Rastogi Publications
2. Principle of Anatomy and Physiology, Tortora and Grabowski, Harper Collins college pub.
3. Text Book of Medical Physiology, Guyton and Hall.
4. Animal Physiology and Related Biochemistry H.R Singh Shobhan Lal, Naginchand& Co. edu. Pub. Jalandhar.
5. Cytology, P.S Verma, S. Chand & Co, Ltd., New Delhi
6. Cell Biology, C. B. Powar, Himalaya Book Pub
7. Essential of Cytology, C.B. Powar, Himalaya Book Pub
8. Genetics P.K Gupta, Rastogi Publications, Merrut
9. Genetics P.S Verma & V.K Agrawal, S. Chand & Company, Delhi
10. Text book of Genetics, V. B Rastogi Kedarnath Ramnath, Meerut
11. P.D Sharma Ecology & Environment
12. Economic Zoology, G.S. Shukla & V.B. Upadhaya, Rastogi Publication, Meerut.
13. An Introduction to Parasitology, P.N. Sharma, L.S Ratnu, S. Chand & Co Ltd., New Delhi

Note:

1. *The list of reference books provided here in the syllabus is not exhaustive list, Professor and Students may use any other suitable and authentic reference source.*
2. *Besides using chalk and duster professors are strongly encouraged to make use of the additional methods of teaching, to complete the teaching.*



SCC 102 GCH General Chemistry

Unit No.	Content	Hours
1.	<p>(A) CHEMICAL BONDING</p> <ul style="list-style-type: none"> ➤ Valence bond theory & its application ➤ Directional characteristics of covalent bond ➤ Various types of hybridization and shape of simple inorganic molecules ➤ V.S.E.P.R. theory for NH₃, H₂O, ClF₃, SF₄, SF₆, I₃⁻, IF₇, CH₄, BeCl₂, BF₃ ➤ M.O. Theory-Energy level diagram for homo nucleus diatomic molecules (N₂ and O₂) and hetero diatomic molecule (CO and NO) <p>(B) COORDINATION COMPOUNDS</p> <ul style="list-style-type: none"> ➤ Definition ➤ Nomenclature of Complex. ➤ Werner's theory and its experimental verification. ➤ Concept of Effective Atomic Numbers (E.A.N.) for Coordination Compounds. ➤ Limitations of Valence bond theory of transition metal Complexes. ➤ An Elementary idea of (C.F.T.) Crystal field splitting of d-orbital in Oh and Td. ➤ Factors affecting to the crystal field splitting. ➤ Application of common complexes & chelates. 	20
2	<p>A) Alkanes: (Saturated Hydrocarbons)</p> <ul style="list-style-type: none"> ➤ Introduction of Alkanes ➤ IUPAC Nomenclature of Alkanes ➤ Reduction of R-X, Wurtz's reaction, Hydrolysis of R-Mg-X, Decarboxylation of acid, Kolbe's electrolytic process, Free radical mechanisms (Chlorination of Methane) 	20



	<p>(B) Alkenes & Alkynes : (Unsaturated Hydrocarbons)</p> <ul style="list-style-type: none"> ➤ Introduction of Alkenes & Alkynes. ➤ IUPAC Nomenclature of Alkenes & Alkynes. ➤ Preparation of Alkenes & Alkynes (Dehydration, Dehalogenation, Dehydrohalogenation) ➤ Reaction with H_2, X_2, HX, $HOCl$, H_2SO_4 and Hydroboration. ➤ Oxidation Reactions: <ol style="list-style-type: none"> 1. With cold alkaline $KMnO_4$ (Baeyer's Reagent) 2. Oxidative cleavage with acidified or hot $KMnO_4$ 3. Ozonolysis (O_3); Polymerization; Reactions of terminal Acetylenes <ol style="list-style-type: none"> a) Addition of water b) $Na/Liquid\ NH_3$. 	
3	<p>(A) STRUCTURE AND PROPERTIES</p> <ul style="list-style-type: none"> ➤ Factors affecting to the properties of organic molecule ❖ Intramolecular forces (dipol-dipol interaction, vander waals forces) ❖ Electromeric effect ❖ Inductive effect ❖ Resonance effect(draw resonating structures of Nitro benzene, Chlorobenzen, Phenoxide ion, Anillinium ion, Acetate ion) ❖ Hyper conjugation (o,p-directing effect of Alkyl group, Stability of Carbonium ion and Free radicals) ❖ Determination of molecular formula <p>(B) REACTION MECHANISM</p> <ul style="list-style-type: none"> ➤ Fission of Co-Valent bond (With at least one example of each intermediates) ➤ Types of reagents. ➤ Types of organic reaction with mechanism. ➤ Substitution reactions (Nucleophilic & Electrophilic) ➤ Addition reactions (Nucleophilic & Electrophilic) ➤ Elimination reactions (E1 & E2) 	20

<p>4</p>	<p>STEREO CHEMISTRY OF ORGANIC COMPOUNDS</p> <p>Introduction of Stereo Isomers;</p> <ul style="list-style-type: none"> ➤ Optical isomerism : General, Discussion of elements of symmetry, Molecular chirality, Enantiomers, Optical activity, Properties of enantiomers, Chiral and achiral molecules with two stereogenic centers, Diastereomers, Threo and Erythro diastereomers, Meso compounds, R,S Nomenclature. ➤ Geometrical isomerism: Definition and general discussion of geometric isomers, General methods of structure determination (physical methods), E-Z nomenclature (Simple illustration should be given). ➤ Conformational isomerism: Definition, Conformational analysis of ethane, n-butane with rotational and torsional diagram, Conformation of cyclo hexane, Axial and equatorial bonds, Newmann projection, Show horse formula, Fisher & flying wedge formula, Difference between conformation and configuration. 	<p>20</p>
<p>5</p>	<p>THERMODYNAMICS</p> <ul style="list-style-type: none"> ➤ Thermodynamics (only introduction) ➤ System and surrounding- work & heat, state function, thermodynamic process, internal energy, enthalpy, free energy, maximum work function. ➤ First law of thermodynamics ➤ Heat capacity, specific and molar heat capacity, heat capacity at constant volume and pressure and their relationship ➤ Work done in adiabatic and isothermal reversible expansion of an ideal gas. ➤ Second law of thermodynamics ➤ Carnot cycle and its efficiency ➤ Concept of entropy; entropy change for an ideal gas under different conditions, entropy change for mixture of ideal gases ➤ Gibbs-Helmholtz equation ➤ Want-Hoff isotherm and isochors 	<p>20</p>



	<p>(B) CHEMICAL KINETICS.</p> <ul style="list-style-type: none"> ➤ Introduction of following terms. ➤ Rate of reaction, Order of reaction, Molecularity. ➤ Rate equation for second order reaction. (a=b) & (a b). ➤ Characteristics of second order reaction. ➤ Rate equation for third order reaction. ➤ Characteristics of third order reaction. ➤ Numerical. 	
6	<p>(A) Adsorption:</p> <ul style="list-style-type: none"> ➤ Definition of Terms Adsorption ➤ Types of Adsorption (Physical, Chemical and their difference) ➤ Types of Adsorption isotherms (5 types) ➤ Derivation of Freundlich adsorption isotherm ➤ Derivation of Langmuir adsorption isotherm ➤ Applications of adsorption. <p>(B) Catalysis :</p> <ul style="list-style-type: none"> ➤ Characteristic of catalysis ➤ Homogenous and Heterogeneous catalysis ➤ Enzyme catalyzed reaction and derivation mechanism ➤ Marten Reaction. 	20

Reference Books Name
<p>Inorganic Chemistry</p> <ol style="list-style-type: none"> 1. 'Source Book on Atomic Energy' by glastone, 1969. 2. 'Modern Inorganic Chemistry' by G.F.Liporni, ELBS, 4th edn, colling Educational, 1983. 3. 'Inorganic Chemistry' D.F.Shriver, P.W.Atkinss and C.H.Longford, 3 rd edn, ELPS Oxford University Press, 1999. 4. 'Nuclear and Redio Chemistry' by G fried lander, J.W.Kennedy, E.S.macias and J.M.Miller, 3rd edn, John wiley, 1981. 5. Essentials of Nuclear Chemistry' H.J.Arnical, 4th edn, New Age International, 1995.



6. 'Concise Inorganic Chemistry' J.D.Lee, 5th edn.
7. 'Inorganic Chemistry', D.F.Shriver, P.W.Atkinss, 3rd edn, Oxferd, 1999.
8. 'Concise Inorganic Chemistry' J.D.Lee, 4th edn, Champman and Hall ELBS, 1991.
9. 'Inorganic Chemistry' by A.G.Sharp, 3rd edn, ELBS, Longman, 1990.

Organic Chemistry

1. 'Organic reaction and mechanism, P.S.Kalsi, New Age international Publishers.
2. Text book of organic Chemistry, P.S.Kalsi, New Age international Publishers.
3. Organic Chemistry Vol. I & II, S.M.Mukherji, S.P.Singh, R.P.Kapoor.
4. Reaction mechanism in Organic Chemistry, S.M.Mukhergi, S.P.Singh. 3rd edn, Macmillan.
5. Reaction Mechanism and Reagents in Organic Chemistry, Gurdeep R. Chatwal 4th edn, Himalaya Publication House.
6. Text book of Organic Chemistry, Arun Bahal, S.Chand.
7. Organic Chemistry, R.Morrison and R.Boyd, 6th edn, Pearson Education 2003.
8. Organic Chemistry, T.W.Graham Solomons, 4th edn, John Wilay, 1998.

Physical Chemistry

1. Advance Physical Chemistry by Gurdeepraj.
2. Physical Chemistry (Question and Answer) by R.N.Madan, G.D.Tuli,S.Chand.
3. Principal of Physical Chemistry by Puri, Sharma, Pathania.
4. Chemical Thermodynamics by R.P.Rastogi and R.R.Misra.
5. Nuclear Chemistry by C.V.Shekhar, Dominent-Publisher, New Delhi.
6. Essentials of physical Chemistry by B.S.Bahal, Arun Bahal, G.D.Tuli.
7. Physical Chemistry by P.W.Atkins, 5th edn, Oxferd 1994 7th edn-2002.
8. Physical Chemistry by R.A.Albert and R.J.Silby, John Wiley1995.
9. Physical Chemistry by G.H.Barrow, 5th edn, Mac Graw Hill, 1988, 6th edn,1996.
10. Physical Chemistry by W.J.Moore, 4th edn, Orient Longmans 1969.
11. Elements of Physical Chemistry by Samuel Glassten and Devid Lewis.



SCC 103 GPH General Physics

Unit No.	Content	Hours
1.	<p><u>Mathematical physics</u></p> <p><u>Vector algebra</u></p> <ul style="list-style-type: none"> ➤ Scalar and vector quantities[1.1], addition and subtraction of vectors[1.8], addition of more than two vectors[1.9], rectangular components of a vector[1.11], position vector[1.12], ➤ Product of two vectors[1.15], scalar product[1.16], important points about scalar products[1.17], some illustrative applications of scalar product[1.18], vector product[1.19], important points about vector products[1.2], some illustrative applications of vector product[1.21], triple product of vectors[1.22], scalar triple product[1.23], vector triple product[1.24], evaluation of vector triple product[1.25], ➤ Scalar and vector fields[1.33], partial derivatives – gradient[1.34], the operator ∇[1.35], magnitude and direction of $\nabla\phi$[1.36], divergence and curl[1.37], applications of divergence and curl[1.38], some useful results[1.39], the Laplacian operator[1.4]. <p><i>Text book: Mechanics by D S Mathur, 2nd edition.</i></p>	24
2	<p><u>Classical mechanics</u></p> <p>a) <u>Linear motion</u></p> <ul style="list-style-type: none"> ➤ Newton’s laws of motion[5.2, 5.3, 5.6, 5.8], work[7.4], work-kinetic energy theorem[7.5], power[7.9], potential energy[8.1, 8.2, 8.3], the law of conservation of energy[8.5], ➤ Centre of mass [9.2], Newton's second law for a system of particles [9.3], linear momentum [9.4, 9.5], conservation of linear momentum[9.7]. <p><i>Text book: Fundamentals of Physics by Resnick, Halliday & Walker, 9th edition.</i></p>	24



	<p>b) <u>Rotational motion</u></p> <ul style="list-style-type: none"> ➤ Rotation[2.1], angular velocity[2.2], angular acceleration[2.3], couple[2.4], work done by a couple[2.5], relation between couple & angular acceleration[2.6], ➤ Moment of inertia[3.1], radius of gyration[3.1], expression for the moment of inertia and torque[3.2,3.3], perpendicular axes theorem and parallel axes theorem for moment of inertia[3.4]. <p><i>Text book: Elements of properties of matter by D S Mathur, S Chand & co.</i></p> <p>c) <u>Wave motion</u></p> <ul style="list-style-type: none"> ➤ Wave motion[4.1, 4.2], characteristics of wave motion[4.3], transverse wave motion[4.4], longitudinal wave motion[4.5], definitions and relations between frequency and wavelength[4.6, 4.7], ➤ Equation of simple harmonic waves[4.11], differential equation of wave motion[4.12], particle velocity and wave velocity[4.13], energy of progressive waves[4.15], ➤ Laws of transverse vibrations in a string and verification of them[7.3, 7.4], Melde's experiment[7.5]. <p><i>Text books: Waves and oscillations by Brij Lal and Subrahmanyam.</i></p>	
3	<p><u>Optics</u></p> <p>a) <u>Geometrical Optics</u></p> <ul style="list-style-type: none"> ➤ Fermat's principle of least time[1.3], law of reflection & law of refraction from Fermat's principle[1.3], ➤ Dispersion by a prism [3.13], refraction through a prism[3.14], angular & chromatic dispersions[3.16]. <p>b) <u>Wave Optics</u></p> <ul style="list-style-type: none"> ➤ Introduction[8.1], coherent sources[8.3], phase difference & path difference[8.4], ➤ Theory of interference fringes[8.6], Fresnel's biprism [8.8], 	24

	<ul style="list-style-type: none"> ➤ Interference in thin films[8.15], interference due to reflected light (thin film)[8.16], ➤ Fringes produced by a wedge-shaped thin film[8.21], Newton's rings (for reflected light only)[8.23], determination of the wavelength of light using Newton's rings[8.24], refractive index of a liquid using Newton's rings[8.25]. <p><i>Text book : A textbook of Optics : Brij Lal and Subrahmanyam, 22nd ed.</i></p>	
4	<p>A) <u>Nuclear Physics</u></p> <p><u>Radioactivity</u></p> <ul style="list-style-type: none"> ➤ The law of radioactive decay, Radioactive growth and decay, ➤ Ideal equilibrium, transient equilibrium and secular equilibrium, ➤ Radioactive series, ➤ Age of earth, Carbon dating (Archaeological time scale). <p><i>Text book : Nuclear Physics – An introduction, S. B. Patel, New Age International Limited (Articles : 2.3, 2.6 to 2.13).</i></p> <p>B) <u>Modern physics</u></p> <ul style="list-style-type: none"> ➤ Introduction to black body radiation[2.2], ➤ Planck's radiation law and its special cases[2.2], ➤ Photoelectric effect[2.3], ➤ Light[2.4], ➤ X – rays [2.5], ➤ Compton effect[2.7]. <p><i>Text book : Concepts of Modern Physics - Arthur Baiser, Tata McGraw Hill, New Delhi.</i></p>	24
5	<p><u>Electronics</u></p> <ul style="list-style-type: none"> ➤ PN junction diode : V- I characteristics of PN junction diode[5.18], ➤ DC power supply : Use of diodes in rectifiers[6.2, 6.7], half wave rectifier[6.8 to 6.10], full wave rectifier[6.11 to 6.15], ripple factor[6.18], 	24

	<ul style="list-style-type: none"> ➤ Filters : Introduction[6.20], types of filter circuits (shunt capacitor filter, series inductor filter, choke - input LC filter, the CLC or PI filter)[6.21], ➤ Types of diodes : Zener diode (Zener effect & voltage regulation)[6.24 to 6.27], light emitting diode[7.2 to 7.6], photo diode[7.7 to 7.10]. <p><i>Text book : Principles of Electronics by V.K.Mehta & Rohit Mehta. S.Chand Company.</i></p>	
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Other Reference Books For B.Sc. Physics (Theory)

Other Reference Books For B.Sc. Physics (Theory)
1. Concept of physics by H C Verma part 1 Publisher: Bharati Bhawan
2. Sears and Zemansky's University Physics with modern physics by H D Young Publisher: PEARSON
3. Engineering Physics by R.K.Gaur, S.L.Gupta. Dhanpat Rai Publications
4. Elements of properties of matter by D S Mathur, S Chand & co
5. Waves and Oscillations by Brij Lal and Subrahmaniam. S.Chand comp.
6. Fundamentals of Physics by Resnick, Halliday & Walker, 9 th edition
7. Concepts of Modern Physics by A Beiser
8. Mechanics by D S Mathur, 2nd ed
9. Basic electronics by B L Theraja (S.Chand & Company Ltd.)
10. Principles of Electronics by V.K.Mehta & Rohit Mehta. S.Chand Company
11. Text Book of Quantum Mechanics by Mathews and Venkateshan, (Tata McGraw Hill Pub. Comp.)
12. Quantum Mechanics - Ghatak and Loknathan, Macmillan India Ltd.,Delhi
13. Introduction to Electrodynamics by D.J.Griffiths [Prentice Hall of India Pvt. Ltd, Delhi]
14. Digital Electronics by Malvino, McGraw Hill International Edition.
15. Modern Physics by R.Murugesan & Kiruthiga Sivaprasath, S.Chand Comp
16. Elements of Spectroscopy by Gupta, Kumar, Sharma (Pragati Prakashan)



17. Elementary Statistical Mechanics by Gupta and Kumar, (Pragati Prakashan)
18. Fundamentals of Solid state Physics by Saxena, Gupta and Saxena, (Pragati Prakashan)
19. Principle of OPTICS By B.K.Mathur Publisher : Gopal Printing.
20. Basic Electronics and Linear Circuits - N. N. Bhargava, D.C. Kulshreshtha & S.C. Gupta Tata McGraw-Hill Ltd., New Delhi.
21. Nuclear Physics – An introduction, S. B. Patel, New Age International Limited.
22. A Text Book Of OPTICS By N.Subrahmanyam, Brijlal, M.N. Avadhanulu Publisher: S.chand.



SCE 101 BES Basic Environment Studies

Unit No.	Content	Hours
1.	<p>Introduction to Environment, Ecology and Ecosystem</p> <ul style="list-style-type: none"> • Definition and Inter-relationships amongst and between them • Components of Environment, • Relationship between different components • Man-Environment relationship • Impact of Technology on the environment • Environmental Degradation 	10
2	<p>Ecology & Ecosystems</p> <ul style="list-style-type: none"> • Introduction • Ecology- Objectives and Classification • Concepts of an ecosystem- structure & function of ecosystem • Components of ecosystem- Producers, Consumers, Decomposers • Bio-Geo- Chemical Cycles- <ul style="list-style-type: none"> ▪ Hydrological Cycle, ▪ Carbon cycle, ▪ Oxygen Cycle, ▪ Nitrogen Cycle, ▪ Sulfur Cycle • Energy Flow in Ecosystem • Food Chains: Grazing, Detritus, & Food webs • Ecological Pyramids • Major Ecosystems: <ul style="list-style-type: none"> ▪ Forest Ecosystem, ▪ Grassland Ecosystem, ▪ Desert Ecosystem, ▪ Aquatic Ecosystem, ▪ Estuarine Ecosystem 	25
3	<p>Population & Natural Resources</p> <ul style="list-style-type: none"> • Development of Habitation patterns • Environmental factors governing human settlement • Population & Pollution , • Reasons for overpopulation , • Population Growth, • Demographic • Projections and Population Structures , • Production of food • Renewable & Non-renewable Resources: <ul style="list-style-type: none"> ▪ Renewable Resources, ▪ Non-renewable Resources, ▪ Destruction versus Conservation 	30



	<ul style="list-style-type: none"> • Water Resources: <ul style="list-style-type: none"> ▪ Water Resources-Indian Scenario, ▪ Water Sources- Surface & Ground Water Sources, ▪ Uses & overuses of water resources, ▪ Problems due to Overexploitation of Water Resources • Forest Resources : <ul style="list-style-type: none"> ▪ Forest Resources - Indian Scenario , ▪ Importance of forests- Ecologically & Economically, ▪ Uses of forest products, ▪ Forest Types, ▪ Deforestations-Causes ▪ effects, ▪ Forest Degradation in India • Energy Resources : <ul style="list-style-type: none"> ▪ Energy Resources - Indian Scenario , ▪ Conventional Energy Sources & its problems, ▪ non-conventional energy sources-Advantages & its limitations , ▪ Problems due to Overexploitation of Energy Resources 	
4	<p>Environmental Pollution</p> <ul style="list-style-type: none"> • Types of Environmental Pollution • Water Pollution : <ul style="list-style-type: none"> ▪ Introduction – Water Quality Standards , ▪ Sources of Water Pollution, ▪ Classification of water pollutants, ▪ Effects of water pollutants , ▪ Eutrophication • Air Pollution : <ul style="list-style-type: none"> ▪ Composition of air , ▪ Structure of atmosphere, ▪ Ambient Air Quality Standards, ▪ Classification of air pollutants, ▪ Sources of common air pollutants like SPM, SO₂, NO_x – Natural & Anthropogenic Sources, ▪ Effects of common air pollutants • Land & Noise Pollution : <ul style="list-style-type: none"> ▪ Introduction- Lithosphere, ▪ Land Uses, ▪ Causes of landDegradation, ▪ Sources of Noise Pollution, ▪ Effects of noise pollution • Current Environmental Global Issues : <ul style="list-style-type: none"> ▪ Global Warming & Green Houses Effects, ▪ Acid Rain, ▪ Depletion of Ozone Layer 	25

Reference Books Name
1 Environmental Studies: R. Rajagopalan, Oxford University Press 2 Environmental Pollution: Causes, Effects & Control by K.C Agrawal 3 Environmental Science by Richard T Wright & Bernard J Nebel 4 Environmental Science by Daniel B Botkin & Edward A Keller 5 Environmental Engineering & Management by Suresh K Dameja 6 Environmental Management by Dr. Swapan C Deb 7 Environment & Ecology by Dr Gourkrishna Dasmohapatra 8 Introduction To Environmental Engineering and Science by Master Gilbert M.



SFC 101 ENG English-I

Unit No.	Content	Hours
1.	<p>➤ Selected Short Stories:</p> <ol style="list-style-type: none"> 1. Father's help by R. K. Narayana. 2. An Astrologer's day by R.K. Narayan 3. The Happy Prince by Oscar Wilde 	18
2	<p>➤ Collection of poems:</p> <ol style="list-style-type: none"> 1. The Tiger By William Blake. 2. Open Thine Eyes and See thy God By Tagore 3. The Eagle By Tennyson 	18
3	<p>➤ Grammar:</p> <ul style="list-style-type: none"> • Articles • Parts of Speech • Tenses. <ol style="list-style-type: none"> 1. Present simple tense. 2. Present continuous tense. 3. Present perfect tense. 4. Present perfect continuous tense. 5. past simple tense. 6. Past continuous tense. 7. Past perfect tense. 8. Past perfect continuous tense. 9. Future simple tense. 10. Future Continuous tense. 11. Future perfect tense. 12. Future perfect continuous tense. • Prepositions (Indicating Time, Place and Direction) • Modal auxiliaries (Can, could, May, Might, should, must, need, would etc) 	18
4	<p>➤ Composition:</p> <p>(A) Guided Dialogue.</p> <p>(Note: Write the dialogue on any 1 of the topic given in the question paper.)</p> <p>(B) Paragraph Writing. (5 topics)</p> <ul style="list-style-type: none"> • My Favorite Cricketer • My First day in the college • My favorite Festival • My Ambition • The Flag of my nation <p>(Note: Write an essay on any 1 of the topic given in the question paper)</p>	18
5	<p>➤ MCQs:</p> <p>(MCQs will be asked from first three units)</p>	18



Reference Books

1. English Grammar book by Wren Martin
2. Contemporary English grammar structure and composition. By David Greene
3. From Malgudi Days collection of short stories by R K Narayan.
4. Games at Twilight and other stories by Anita Desai.
5. The Happy Prince and other stories by Oscar Wilde.



SPR 101 Practical Module-I

1. Analysis of Urine

Physical Analysis

- Colour, appearance, odor, deposits (if any)

Chemical Analysis

- Sugar
- Protein
- Bile Pigments
- pH
- Specific Gravity
- Ketones
- Urea
- Creatinine

Microscopies

- Pus Cells
- R.B.C s
- Bacteria

2. Non- Chordate Animal Diversity (Study through Slides/Model/Chart)

- Amoeba
- Paramecium
- Vorticella
- Coelenterata

3. Cytology and Genetics (Study through Slides/Model/Chart)

- Prokaryotic and Eukaryotic Cell
- Cell membrane
- Membrane Transport
- Nucleus and Nucleolus
- Mendelian Genetics

Study of Genetics through Charts

- Monohybrid cross
- Dihybrid cross
- Incomplete Dominance
- Co- Dominance
- Multiple alleles
- Polygenic inheritance
- Lethal Gene



- Complementary Genes ((e.g. Pea Plant Purple and White Flower)
- Epistasis- Dominant (e.g. Dog) and Recessive (e.g. Mice)
- Sex Linked Inheritance:
 - X linked (Colour Blindness in man; eye colour in drosophila)
 - Y Linked (Holandric Genes)
- Sex Influenced Inheritance
- Baldness in man

b) Solve the Given Genetic Problem (As per Appendix)

6. Physiology of Blood

1. Points for Drawing blood by syringe
2. Preparation of Human Blood Smear
3. Determination of ABO Blood Groups in Humans
4. Determination of Blood Clotting Time (BT,CT,PT)
5. Separation of Plasma and serum from Blood



SPR 102 Practical Module-I

Inorganic Chemistry Practical

➤ *Qualitative analysis of an Inorganic Compound.*

• Cation analysis; separation and identification of ions from group I, II, III-A, III-B, IV, V-A, V-B.

• Anion analysis like

Cl⁻, Br⁻, I⁻, NO₃⁻, NO₂⁻, SO₄⁻², SO₃⁻², S⁻², CrO₄⁻², CO₃⁻², PO₄⁻³, Cr₂O₇⁻² (Water Soluble and insoluble).

• Candidate should perform the analysis of at least 10 compounds.

Organic Chemistry Practical

➤ *Qualitative analysis of an Organic Compound.*

1) Identification of an organic compound through the functional group analysis, Determination of melting point and boiling point, LS Test, Confirmative Test.

2) Candidate should perform the analysis of at least 10 compounds.

List of compounds

❖ **Acids:**

Benzoic acid, Cinnamic acid, Phthalic acid, Oxalic acid, Succinic acid.

❖ **Phenols:**

α-Naphthol, β-Naphthol.

❖ **Bases:**

p-Toludine, Diphenylamine, Aniline.

❖ **Neutrals:**

Naphthalene, Anthracene, Acetamide, Benzamide, Acetanilide, m-Dinitrobenzene, Urea,

Thiourea, Toluene, Acetone, Benzaldehyde, Methyl acetate, Ethyl acetate, Ethanol, 1-Propanol,

Glycerol, Chloroform,

Carbon tetrachloride, Chlorobenzene, Nitrobenzene.



(A) Standardization

- 1) Preparation of standard solution of $\text{Na}_2\text{S}_2\text{O}_3$ and standardization of I_2 solution.
- 2) Preparation of standard solution of EDTA and estimation of $\text{Ca}^{+2}/\text{Mg}^{+2}$ in $\text{CaCl}_2/\text{MgCl}_2$ solution.
- 3) Preparation of standard solution of $\text{K}_2\text{Cr}_2\text{O}_7$ and standardization of $\text{FeSO}_4 / \text{Fe}(\text{NH})_2 \text{SO}_4 \cdot \text{H}_2\text{O}$ solution.

(B) Volumetric Titrations

- 1) To determine the strength of NaOH and Na_2CO_3 present in the solution mixture of NaOH & Na_2CO_3 and to find out their percentage composition.
- 2) To determine the Normality, gram/liter and molarity of $\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$ and $\text{K}_2\text{C}_2\text{O}_4$ present in the solution mixture of $\text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$ & $\text{K}_2\text{C}_2\text{O}_4$ by using $X \text{ N NaOH}$ and $Y \text{ N KMnO}_4$ solutions.



BIRSA MUNDA TRIBAL UNIVERSITY, RAJPIPALA.
B. Sc. Chemistry
1st Year
Pattern of University Practical Exam

Time: 10:30am to 5:00pm (Including 30 minutes recess) Total Marks: 100

(A) Inorganic (25 marks)

- *Qualitative analysis of an Inorganic Compound.*

(B) Organic (25 marks)

- *Qualitative analysis of an organic Compound.*

(C) Analytical (25 marks)

- Any one exercise should be selected for each candidate from syllabus.

(D) Viva-Voce and Journal

- **Viva-Voce on practical base (10 marks)**
- **Journal (15 marks)**
 - **Note: Certified practical journal is compulsory for practical exam.**
 - **Morning Session : 10:30 am to 01:30 pm**
 - ❖ **Inorganic**
 - ❖ **Analytical**
 - **Evening Session : 02:00 pm to 05:00**
 - ❖ **Analytical (Cont.)**
 - ❖ **Organic**



SPR 103 Practical Module-I	
Experiment No	Aim of the experiment
1.	Study of errors and measurements using vernire caliper and micrometer screw.
2.	Determine the Moment of Inertia of a Fly wheel.
3.	Determine the moment of inertia of rectangular body & prove law of perpendicular axis by Bifilar Suspension.
4.	Find the refractive index of the given liquid using lense.
5.	Determine the value of capacitance of the given capacitor.
6.	Determine the value of inductance of the given inductor.
7.	Study of the transformer.
8.	Study of charging and discharging of capacitor and determine the time constant of capacitor.
9.	Study of series resonance in L-C-R circuit.
10.	Study of parallel resonance in LC-R circuit.
11.	Study of semiconductor diode characteristics.
12.	Study of Zener diode characteristics.
13.	Zener diode as a voltage regulator.
14.	Find unknown frequency of tuning fork by Melde's experiment.
15.	Find unknown frequency of tuning fork by Resonator.
16.	Study of spectrometer. (Schuster's method and calibrations)
17.	Determine dispersive power of the material of a prism using spectrometer.
18.	Half wave rectifier.
19.	Full wave centre taped rectifier.
20.	Full wave bridge rectifier.
21.	Low resistance by Wheatstone's bridge method of projection.
22.	Verify the Stefan Boltzman's fourth power law using dc power source.
23.	Simulation of nuclear radioactive decay using calculator.
24.	Study of Newton's rings.
No	Reference Books For Physics Experiments
1)	B.Sc. Practical physics By C.L.Arora Pub: S.chand.
2)	A text book of Practical Physics By Indu Prakash & Ramkrishna Pub: Kitab Mahal, New Delhi.
3)	Practical Physics By S.L.Gupta and V. Kumar Pub: Pragati Prakashan, Meerut.
4)	B.Saraf et al-Physics through experiments Vol. I & II.
5)	Advanced Practical Physics by Chauhan & Singh. Pragati Prakashan
6)	Practical Physics by Chattopadhyay, Rakshit & Saha
7)	Experimental Physics, University Granth Nirman Board, (Gujarati Medium)



BIRSA MUNDA TRIBAL UNIVERSITY, RAJPIPALA.
B. Sc. Physics
1st Year
Pattern of University Practical Exam

Time: 10:30am to 5:00pm (Including 30 minutes recess) Total Marks: 100

(A) Experiments (60 marks)

- **In this exam, a student will have to perform two experiments, each experiment of 3 hours duration**

(B) Viva-Voce and Journal

- **Viva-Voce on practical base (20 marks)**
- **Journal (20 marks)**
- **Note: Certified practical journal is compulsory for practical exam.**

