

BIRSA MUNDA TRIBAL UNIVERSITY

District: Narmada

School of Science

Syllabus

Bachelor of Science

Second Year

Birsa Munda Tribal University

**School of Science
(Bachelor of Science)**

2nd YEAR

**Teaching Examination Scheme
&
Syllabus**



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 201 Z02		
Taxonomy, Physiology, Cytology, Human Parasitology, Economic Zoology		
Unit No.	Content	Hours
1.	<u>Classification up to order</u> <ul style="list-style-type: none"> • Protochordata • Cyclostomata • Pisces • Amphibia 	20
2	<u>Classification up to order</u> <ul style="list-style-type: none"> • Reptilia • Aves • Mammalia 	20
3	<u>Animal Physiology (with special reference to mammals)</u> <ul style="list-style-type: none"> • Digestion • Respiration • Nerve Coordination • Excretion 	20
4.	<u>Cytology</u> <u>Structure and Functions of Cell Organelles :</u> <ul style="list-style-type: none"> • Prokaryotic and Eukaryotic Cell • Cell membrane • Nucleus and Nucleolus • Mitochondria • Cytoskeleton • Golgi bodies • Endoplasmic reticulum • Ribosomes • Lysosomes • Peroxisomes 	20

5.	<p><u>Human Parasitology</u></p> <p>1. Definition : Parasite, Host and Parasitology 2. Type of Parasites : Facultative, Obligate, Endoparasite and Ectoparasite 3. Types of Host: Principal, Intermediate and Reservoir 4. Life cycle and Pathogenicity only of the following parasites: <i>Entamoebahistolytica</i> <i>Plasmodium vivax</i> <i>Taeniasolium</i> <i>Ascarislumbricoidus</i></p>	20
6.	<p><u>Economic Zoology</u></p> <ul style="list-style-type: none"> • Pisciculture • Pearl culture • Lac Culture • Prawn culture • Vermiculture • Dairy Farming 	20

Reference Books

1. Modern Textbook of Zoology vertebrates, 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 ShobhanLal, 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. An Introduction to Parasitology, P.N. Sharma, L.S Ratnu, S. Chand & Co Ltd., New Delhi
9. Economic Zoology, G.S. Shukla & V.B. Upadhaya, Rastogi Publication, Meerut.
10. Economic Zoology, Sarkar, kundu & Chaki, New Central Book Agency(P) Ltd. New Delhi
11. Applied Zoology, N Arumugam, MuruganRajeswar & Prabhu, Saras Publication, Tamilnadu
12. મત્સ્યવ્યવસાયવિજ્ઞાન, પ્રા. નિરંજનદિ. છાયા, પ્રથમઆવૃત્તિ, ૧૯૯૦, ગુજરાતગ્રંથનિર્માણબોર્ડ, ગુજરાતરાજ્ય.
13. મત્સ્યજીવવિજ્ઞાનઅનેમત્સ્યકી, ડૉ. મહાદેવસિ. દુબોપ્રથમઆવૃત્તિ૧૯૮૯, ગુજરાતગ્રંથનિર્માણબોર્ડ, ગુજરાતરાજ્ય.
14. કોષવિજ્ઞાન, બીજીઆવૃત્તિ, પ્રા. વી. સી. શાહ, ગુજરાતગ્રંથનિર્માણબોર્ડ, ગુજરાતરાજ્ય.

Note:

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SCC 202 Z03

**Wildlife Biology, Ophiology, Ichthyology, Comparative Anatomy, Evolution,
Parasitology & Entomology**

Unit No.	Content	Hours
1.	<p>Wildlife Biology</p> <p>1. Introduction to the Term: Wild life, National Park & Sanctuary 2. Study of: (a) Marine National Park, Jamnagar (b) Black Buck national park, Velavadar (c) Gir National Park and Sanctuary (d) Wild ass sanctuary (LRK) (e) Nal Sarovar Bird Sanctuary</p> <p>3. Wildlife Management Tools: Binoculars, Camera, Radio Transmitters, Receivers, Tranquilizer, Gun/darts 4. Some Endangered Fauna of India (Give scientific name too & brief note on each: Asiatic Lion, Tiger, Leopard, Snow Leopard, Black Buck, Indian Bison, Indian Wild ass, Indian one horned Rhino, Great Indian Bustard, Great Indian Hornbill, Peacock, Gangetic dolphin, Vultures.</p>	20
2.	<p>Ophiology</p> <p>A. Identification of Venomous and Non Venomous Snakes by Morphological characters B. Importance of Snakes C. Management of Snake Bite D. Snakes of Gujarat. Venomous: Russell Viper, Krait, Cobra, King Cobra, Marine Snake Non Venomous: Boa, Python, Rat snake</p>	20
3.	<p>Ichthyology</p> <p>1. Brief Introduction and Importance of Studying Fisheries science 2. Study of fishing gears: Nets : Stringed cast net, Gill net, Drag net, Trawl net Boats: Dugout canoe, Macchwa, Flat bottom boat, Trawler. 3. Identification and Classification of following fishes up to family: Catla, Rohu, Mrigal, Hilsa, Dara, Ghol, Bombay duck, Pomfret 4. Home Aquarium: Primary Knowledge, Construction, General Maintenance, Popular Aquarium fishes</p>	20



4.	<p>Comparative Anatomy</p> <p>Comparative Functional anatomy of various system of Vertebrates:</p> <ul style="list-style-type: none"> • Circulatory System including Heart and aortic arches • Brain • Vertebral Column 	20
5.	<p>Evolution</p> <ul style="list-style-type: none"> • Origin of Life • Natural Selection • Role of mutation in evolution • Evidences of Evolution from comparative functional anatomy- Homologus, analogus, vestigial organs, connecting link, atavism (reversion) • Mimicry and Coloration • Variation • Isolation • Speciation • Fossils and Fossilization • Evolution of Man 	20
6	<p>Parasitology & Entomology</p> <p><u>Major infectious and Communicable diseases, their Pathogens, Vectors and Prevention:</u></p> <ul style="list-style-type: none"> • <u>Small Pox</u> • <u>Plague</u> • <u>Malaria</u> • <u>Tuberculosis</u> • <u>Cholera</u> • <u>AIDS</u> <p><u>Major Cattle and Livestock diseases & their Pathogens</u></p> <ul style="list-style-type: none"> • <u>Helminthes</u> <p><u>Vector</u></p> <ul style="list-style-type: none"> • Ticks • Mites • Tabanus • Stomoxys <p><u>Pest</u></p> <ul style="list-style-type: none"> • <u>Pest of Sugar Cane (<i>Pyrrilla perpusiella</i>)</u> • <u>Oil Seed (<i>Achaea janata</i>)</u> • <u>Rice (<i>Sitophilus oryzae</i>)</u> 	20



Reference Books

1. Fish and Fisheries of India, V.B Jhingran, Hindustan Publication, Merrut
2. Fisheries sciences and Indian Fisheries, Srivastava Publication, KitabMahal Publication, Merrut.
3. Fishes, Chandy
4. Indian Wildlife, Srilanka, Nepal APA Publications.
5. Birds of India by Salim Ali, BNHS, Oxford Publication.
6. Threatened Animals of India, B.K Tikader, ZSI, Calcutta.
7. An Introduction to Parasitology, P.N. Sharma, L.S Ratnu, S. Chand & Co Ltd., New Delhi
8. Economic Zoology, G.S. Shukla & V.B. Upadhaya, Rastogi Publication, Meerut.
9. Economic Zoology, Sarkar, kundu & Chaki, New Central Book Agency(P) Ltd. New Delhi
10. Applied Zoology, N Arumugam, MuruganRajeswar & Prabhu, Saras Publication, Tamilnadu
11. વન્યજીવઅનેતેનીવ્યવસ્થા, ડૉ. વિનોદસી. સોની, બીજીઆવૃત્તિ, ૧૯૯૩, ગુજરાતગ્રંથનિર્માણબોર્ડ, ગુજરાતરાજ્ય
12. પ્રાણીસૃષ્ટિસમુદાયશ્રેણીઓ, ડૉ. પંકજકે. હીરાઘર, પ્રથમઆવૃત્તિ, ૧૯૮૯, ગુજરાતગ્રંથનિર્માણબોર્ડ, ગુજરાતરાજ્ય
13. ઉત્કાંતિ, પ્રો. કે. સત્યનારાયણ, પ્રથમઆવૃત્તિ, ૧૯૮૯, ગુજરાતગ્રંથનિર્માણબોર્ડ, ગુજરાતરાજ્ય
14. મત્સ્યવ્યવસાયવિજ્ઞાન, પ્રો. નિરંજનદે. છાયા, પ્રથમઆવૃત્તિ, ૧૯૯૦, ગુજરાતગ્રંથનિર્માણબોર્ડ, ગુજરાતરાજ્ય
15. મત્સ્યજીવવિજ્ઞાનઅનેમત્સ્યકી, ડૉ. મહાદેવસિ. દુબળેપ્રથમઆવૃત્તિ૧૯૮૯, ગુજરાતગ્રંથનિર્માણબોર્ડ, ગુજરાતરાજ્ય

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SPR 201 PRA Practical Module-II (Based on Theory Paper - SCC 201 Z02) (Taxonomy, Physiology, Cytology, Parasitology & Entomology, Economic Zoology)	
Experiment No	Aim of the experiment
1.	To study of classification of lower vertebrates Subphylum - Protochordata, Division – Cyclostomata, Superclass- Pisces and Class – Amphibia. (Ascidian, amphioxus, lamprey, myxine, scoliodon, electric ray, protopterus, seahorse, ophiocephalus, labeo, ichthyophis, frog, salamander)
2.	To study of classification of higher vertebrates Class- Reptilia, Aves, Mammalia (Calotes, varanus, turtle, krait, rat snake, cobra, russel viper, saw scale viper, pigeon, koel, sparrow, bat, rat)
3.	To study the digestive enzymes from human saliva.
4.	Factors affecting enzymes activities (temperature and pH).
5.	To determine normal and abnormal constituents of urine.
6.	Study of structure and function of various cell organelles.
7.	Study of following life cycle and pathogenicity of human parasites.
8.	Study of following culture methods through charts.

SPR 201 PRA Practical Module-II (Based on Theory Paper- SCC 202 Z03) (Wildlife biology, Fisheries, Comparative anatomy, Evolution, Parasitology)	
Experiment No	Aim of the experiment
1.	To study sanctuaries and National parks of Gujarat.
2.	To Study wildlife management tools.
3.	To study endangered fauna of India.
4.	To study venomous and non-venomous snakes with the help of key/chart.
5.	To study various nets used in fishing.
6.	To study various boats used in fishing.
7.	Identification, classification and its economic important of Selected fishes.
8.	To study management of home aquarium.
9.	To study comparative anatomy of hearts, aortic arches, brain and vertebral column with the help of charts.
10.	To study homologous, analogous and vestigial organs.
11.	To study mimicry and coloration with the help of photograph/charts/specimens.
12.	To study major infectious and communicable human diseases. (Pathogen, vector, pathogenicity and prevention).
13.	To study major cattle and livestock diseases and their pathogens.

BIRSA MUNDA TRIBAL UNIVERSITY
B. Sc. Zoology
2nd Year
Practical Examination
(Practical-II PRA Based on Paper SCC 201 Z02)

Time: 10:30am to 5:00pm (Including 30minutesrecess)

Total Marks: 50

Que. 1 Enzyme activities (Temperature/pH)	(10)
Que. 2 Estimation of normal and abnormal constituents from urine.	(05)
Que. 3 Culture methods	(05)
Que. 4 Spotting	(10)
1. Classification	
2. Classification	
3. Classification	
4. Cell organelles	
5. Pathogens	
Que. 5 Viva	(10)
Que. 6 Journal	(10)



Birsa Munda Tribal University
B.Sc. Zoology
2nd Year
Practical Examination
(Practical-II PRA Based on Paper SCC 202 Z03)

Time: 10:30am to 5:00pm (Including 30minutesrecess)

Total Marks: 50

- Que. 1 Identification, classification and economic important of given fishes (9)
- Que. 2 Describe management of home aquarium (5)
or
Describe various net and boats used in Fishing
or
Vestigial organs
- Que. 3 Describe Given human diseases its Pathogen, vector, pathogenicity and prevention (6)
- Que.4 Spotting (10)
1. Identify and Describe Given Snake
 2. Identify and Describe Given Wildlife Management Tool
 3. Identify and Describe Given Endangered Fauna of India
 4. Identify Species and Describe their Mimicry/Coloration behavior
 5. Identify Given Live Stock Disease and Its Pathogen and Pathogenicity
- Que.5. Viva (10)
- Que.6Journal (10)

**Birsa Munda Tribal University,
Vocational Training Centre(VTC) ,
Near RTO, Vavdi Road,
Dist. Narmada
Rajpipla**

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

**Teaching Examination Scheme
&
Syllabus**

With Effect

June-2019-2020

1st Year Syllabus

Sr. No.	Paper Code	Paper Name	Hrs./ Week	Marking scheme		Total
				Extern al	Intern al	
1	SCC 101 Z01	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	SPR 101 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
				Extern al	Intern al	
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 204 IPC	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
				Extern al	Intern al	
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 304 Z07	Zoology-VII	4	70	30	100
5	SCC 305 Z08	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 203 OAC Organic and Analytical Chemistry

Unit No.	Content	Hours
1.	<p>(A) Acid-Base Properties</p> <ul style="list-style-type: none"> ➤ Proton Acids-Bases and Lewis Acids-Bases. ➤ Scale of Acidity-Basicity. ➤ Factor effecting on acidity and basicity of compounds. <ol style="list-style-type: none"> 1) Resonance effect (Drawing resonance structures and the conditions for resonance). 2) Inductive and electronic effects. 3) Effect of Hybridization. 4) Steric effects. 5) Effect by hydrogen bonding. 	20
2	<p>(A) Electrophilic Aromatic Substitution</p> <ul style="list-style-type: none"> ➤ Introduction. ➤ Effect of Substituent groups. ➤ Determination of Orientation. ➤ Classification of Substituent groups. ➤ Orientation in disubstituent Benzenes. ➤ Orientation and Synthesis. ➤ Mechanism of...Nitration, Sulphonation, Fridal-Kraft alkylation and Halogenation. ➤ Electrophilic aromatic substitution (Two Step). ➤ Theory of reactivity. ➤ Theory of orientation. ➤ Electron release via resonance. 	20
3	<p>(A) Polynuclear Aromatic Hydrocarbons</p> <ul style="list-style-type: none"> ➤ Nomenclature of Naphthalene & Anthracene derivatives. ➤ Synthesis of Naphthalene & Anthracene by Haworth Synthesis. ➤ Reaction of Naphthalene & Anthracene <ol style="list-style-type: none"> 1. Oxidation 	25

	<p>2. Reduction</p> <p>3. Dehydrogenation</p> <p>4. Nitration</p> <p>5. Halogenation</p> <p>6. Sulphonation</p> <p>7. Friedal-Craft Reaction</p> <ul style="list-style-type: none"> ➤ Orientation of electrophilic substitution in Naphthalene. ➤ Synthesis of alpha –α and –β substituted Naphthalene derivatives (By Howath Synthesis only). ➤ Synthesis of 9- & 9,10- substituted Anthracene derivatives (by howath Synthesis only). <p>(B) Cyclo Alkane</p> <ul style="list-style-type: none"> ➤ Nomenclature. ➤ Physical property. ➤ Method of preparation. ➤ Chemical properties of cyclo alkanes. ➤ Bayer’s Strain theory. ➤ Orbital picture of angle strain. ➤ Heats of combustion and relative stabilities of Cycloalkane. ➤ Strainless ring theory. 	
4	<p>(A)Carbohydrates</p> <ul style="list-style-type: none"> ➤ Introduction. ➤ Definition. ➤ Classification of Mono Saccharides. ➤ Nomenclature. ➤ Step Up and Step Down Reaction of Mono-Saccharide ➤ Reactions of Glucose and Fructose. <ol style="list-style-type: none"> 1) Methylation, 2) Acetylation, 3) Oxidation with Br₂ water and con. HNO₃, 4) Reduction with HCN and NH₂OH, 5) Osazone formation and 	20

	6) Epimerization. 7) Mutarotation (B) Heterocyclic Compound ➤ Introduction. ➤ Nomenclature. ➤ Molecular orbital picture and aromatic characteristics of Pyrrole, Furan and Thiophene. ➤ Method of synthesis for Pyrrole, Furan and Thiophene. ➤ Chemical reactions for Pyrrole, Furan and Thiophene. ➤ Basicity of Pyrrole.	
5	Ultraviolet Spectroscopy ➤ Types of electronic transitions. ➤ Effect of conjugation. ➤ Concept of Chromophore and Auxochrome. ➤ Bathochromic, ➤ Hypsochromic, ➤ Hyper chromic and Hypochromic shifts. ➤ Woodward-fisher rules. ➤ Problems of conjugated enes, enones and aromatic ketones, aldehydes, acids and esters using empirical rules.	15
6	(A) Colorimetry and Spectrophotometry ➤ Law of absorbance, ➤ Visual colorimetric method. ➤ Spectrophotometric Instrumentation. ➤ Light sources optical system, ➤ The wave length Selectors. ➤ Accuracy and error in spectrophotometry. ➤ Analysis of mixture. (B) Potentiometry ➤ The scope of Potentiometric titration. ➤ Graphical methods including Grans plot of selecting end point. ➤ Deferential potentiometric titration. ➤ Dead stop titration. ➤ Ion selective electrode elementary. ➤ Glass Electrode	20

Reference Books Name

- 1) Organic Chemistry by Morrison and Boyd. 4th ed., Pearson Education-2003.
- 2) Organic Chemistry by Pine, Hendrickson, Cram and Hammond 4th ed.
- 3) Advance Organic Chemistry by Jerry March.
- 4) Advance Organic Chemistry by ArunBahal and B. S. Bahal.
- 5) Organic Chemistry Vol. I & II by S. M. Mukherji, S. P. Singh & R. P. Kapoor.
- 6) Reaction mechanism and Reagents in Organic Chemistry by Gurdeep R. Chatwal 4th ed., Himalaya Public House.
- 7) Textbook of Organic Chemistry by ArunBahal, B.S. Bahal& S. Chand.
- 8) Organic Spectroscopy by P.S. Kalsi.
- 9) Organic Chemistry by I.R. Finar.
- 10) Analytical Chemistry by G.D. Christian, J. Wiley
- 11) Fundamental of Analytical Chemistry by D.A. Skoog, D.M. West and F.J. Holler.
- 12) Analytical Chemistry Principals by J. H. Kennedy, W. B. Saunders.
- 13) Analytical Chemistry Principals and Techniques by L.G. Hargis, Prentice Hall.
- 14) Principles of Instrumental Analysis by D. A. Skoogs, J. L. Loary, W.B. Saunders.
- 15) Qualitative Analysis by R.A. Day, Jr and A.L. Underwood, Pr entice Hall.

SCC 204 IPC Inorganic and Physical Chemistry

Unit No.	Content	Hours
1.	<p>(A) Chemistry of Nobel Gases</p> <ul style="list-style-type: none"> ➤ Introduction. Discovery of Noble gases: Occurrence, Isolation of Non-radioactive of Noble gases. ➤ Electronic configuration of Noble gases. Compound of Noble Gases. <ol style="list-style-type: none"> 1. Non real compounds prepared by different methods. 2. True Compounds: XeF₂, XeF₄, XeF₆, XeOF₂, XeO₃, XeO₂F₂, XeO₄, XeOF₄ <p>(B) Boron Hydride</p> <ul style="list-style-type: none"> ➤ Introduction. ➤ Classification of Hydrides. ➤ Preparation, Properties structure and use of Diborone. ➤ Bridge bonding in B₂H₆ (M.O. and SP³ approach.). ➤ Structure of higher Borones: B₄H₁₀, B₅H₉, B₅H₁₁, B₆H₁₀& B₁₀H₁₄ 	15
2	<p>Non Aqueous Solvents</p> <p>Introduction : Classification of solvent, general properties of Ionising solvent</p> <p>(A) Liquid Ammonia (NH₃) :</p> <ul style="list-style-type: none"> ➤ Physical Properties , ➤ Auto-ionization, ➤ Acid-Base Reaction, ➤ Ammonia as a proton – acceptor, ➤ Precipitation reactions, Complex Formation reaction, ➤ Ammonolysis reaction, ➤ Reaction of Metal – Ammonia solution, ➤ Reduction - oxidation (Redox) reactions : ➤ Advantages and Disadvantages of using liquid ammonia as a solvent <p>(B) Liquid SO₂ :</p> <ul style="list-style-type: none"> ➤ Physical properties, ➤ Solubility of inorganic materials and organic compounds, ➤ Electrolytic conductance behavior of solution, 	20

	<ul style="list-style-type: none"> ➤ Acid Base reactions, ➤ Solvolysis, ➤ Precipitation Reaction, ➤ Complex Formation Reactions, ➤ Reduction – oxidation (Redox) Reaction. <p>(C) Liquid HF :</p> <ul style="list-style-type: none"> ➤ Physical properties, ➤ Solvent Effect, ➤ Amphoteric behavior, ➤ Precipitation reactions, ➤ Reduction – oxidation (Redox) reactions, ➤ Solution of compounds of Biological Interest. 	
3	<p>(A) Application of CFT</p> <ul style="list-style-type: none"> ➤ Application of C.F.T. <ol style="list-style-type: none"> 1. for determination of color of complex. 2. Use of C.F.S.E. value. 3. Limitation of C.F.T. 4. Isomerism in complexes. <p>(B) Magnetic Properties of Co-Ordination Compound</p> <ul style="list-style-type: none"> ➤ Type of magnetic behavior, ➤ Method of determining magnetic susceptibility, ➤ Spin only formula, ➤ Magnetic properties for 3rd metal complexes. 	20
4	<p>Physical Properties And Molecular Structure</p> <ul style="list-style-type: none"> ➤ The Vacancy Theory of Liquid, ➤ Vapor-Pressure. ➤ Surface Tension <ol style="list-style-type: none"> 1. Measurement of surface tension by stalagmometer. 2. Perachore and its applications. <ul style="list-style-type: none"> ➤ Viscosity 	20

	<ul style="list-style-type: none"> ❖ Measurement of viscosity by Ostwald-viscometer. ➤ Refractive Index <ol style="list-style-type: none"> 1. Specific refraction. 2. Molar refraction. 3. Measurement of Refractive index by Abbe's Refractometer. <p>Numericals.</p>	
5	<p>Ionic Equilibrium</p> <ul style="list-style-type: none"> ➤ Introduction. ➤ Electrolysis, Ionic Equilibrium, Resistance, Conductance, Specific conductance, Equivalent Conductance, Molar Conductance, Equivalent conductance at Infinite Dilution. ➤ Type of Conductometric Titration <p>❖ Acid-Base Titration</p> <ol style="list-style-type: none"> 1. Strong Acid Vs Strong Base. 2. Strong Acid Vs Weak Base. 3. Weak Acid Vs Strong Base. 4. Weak Acid Vs Weak Base. 5. Strong Acid + Weak Acid Vs Strong Base. <p>❖ Hydrolysis of Salt</p> <ul style="list-style-type: none"> ➤ Classification of Salt. <p>Salts of :</p> <ol style="list-style-type: none"> 1. Strong Acid & Strong Base. 2. Strong Acid & Weak Base. 3. Weak Acid & Strong Base. 4. Weak Acid & Weak Base. <ul style="list-style-type: none"> ➤ Numerical. 	20

6

Electro Chemistry

- Introduction of terms.
 - Oxidation, Reduction, Redox, Anode, Cathode, Electrode,
 - Half Cell,
 - Oxidation and Reduction Potential.
- Electrochemical cell (Galvanic cell) & Representation cell.
- Electrochemical series and its significance.
- Nernst equation of cell EMF and single electrode potential.
- Describe the Electrode.
 1. Metal-Metal ion Electrode,
 2. Standard Hydrogen Electrode.
 3. Calomel Electrode,
 4. Weston standard Electrode.
 5. Glass Electrode,
 6. Quinhydrone Electrode.
 7. Dropping Mercury Electrode
- Application of cell potential.
 1. Equilibrium constant,
 2. Free energy.
 3. pH
- Numerical.

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Reference Books Name

- 1) Concise Inorganic Chemistry, J.D. Lee, 4th ed., ELBS Publication.
- 2) Advance Physical Chemistry by Gurdeep Raj.
- 3) Physical Chemistry (Question and Answers) by R. N. Madan, G. D. Tually, S. Chand..
- 4) Principal of Physical Chemistry by Puri, Sharma &Pathania.
- 5) Essential of Physical Chemistry by B.S. Bahal, ArnBahal and G.D. Tully.
- 6) Physical Chemistry by P.W. Atkins.
- 7) Physical Chemistry by R.A. Alberty and R. J. Silbey.
- 8) Physical Chemistry by G.H. Barrow, 5th ed., Mac Graw Hill, 1998.
- 9) Physical Chemistry by W.J. Moore, 4th ed., Orient Longmans, 1969.
- 10) Advance Inorganic chemistry, by Satya Prakash, G.D. Tuli, S. K. Basu, R.D. Madan and S.Chand
Vol-II.
- 11) Physical chemistry by P.W. Atkins, 5th ed., Oxferd, 1994, 7th ed., 2002.
- 12) Elements of Physical Chemistry, by Samuel Glassten and Devid Lewis.
- 13) ભૌતિક રસાયણના મૂળ તત્વો , યુનિવર્સિટી ગ્રંથ નિર્માણ બોર્ડ

SPR 202 Practical Module-II

Inorganic Chemistry Practical

➤ **Qualitative analysis of an Inorganic Mixture. (Mixture containing 4 radical)**

- Cation analysis; separation and identification of ions from group I, II, III-A, III-B, IV, V-A, V-B.
- Except :
(PO_4^{-3} , BO_3^{-3} , ASO_4^{-3} , ASO_3^{-3} , O^{-2})
- Candidate should perform the analysis of **at least 8** Mixture.

Organic Chemistry Practical

➤ **Qualitative analysis of an Organic Mixture**

- Separation of Organic Mixture on the basis of their solubilities and Identification of the organic compounds through the functional group analysis, Determination of melting point and boiling point, Preparation of suitable derivative. (Only Water Insoluble Compounds)

2) Candidate should perform the analysis of **at least 8** Mixture.

List of compounds

❖ **Acids:**

Benzoic acid, Cinnamic acid, Phthalic acid, Salicylic Acid, P- Nitro Benzoic Acid

❖ **Phenols:**

α -Naphthol, β - Naphthol.

❖ **Bases:**

p-Toludine, Diphenylamine, Methyl aniline, p- Nitro Aniline, Aniline.

❖ **Neutrals:**

Naphthalene, Anthracene, Acetamide, Benzamide, Acetanilide, m-Dinitrobenzene, Toluene, Benzaldehyde, Methyl acetate, Ethyl acetate, Chloroform, Carbon tetrachloride, Chlorobenzene, Nitrobenzene.

Physical Chemistry Practical (Minimum 7 Practical Perform)

- 1) Conductometric titration:- HCl Vs NaOH and Determination of cell constant
- 2) Conductometric titration:- HCl Vs NH_4OH and Determination of cell constant
- 3) Determine the specific refraction and molar refraction of the given liquid A, B and mixture C, (A+B) and calculate the percentage composition of A and B in the mixture C by Abbe's Refractometer.
- 4) Determine the molar refraction $\text{CH}_3\text{COOC}_2\text{H}_5$, $\text{CH}_3\text{COOC}_3\text{H}_7$ and $\text{CH}_3\text{COOC}_4\text{H}_9$ and show the constancy of reaction equivalent of $-\text{CH}_2-$ Group by Abbe's Refractometer.
- 5) To determine the viscosity of a different mixture of liquid A and B and determine the percentage composition of unknown mixture by graphical method.
- 6) To study kinetic reaction of decomposition of H_2O_2 catalysis by iodine ion (Clock reaction)
- 7) Find the solubility and heat of solution of the given organic acid at two different temperatures
- 8) Buffer Solution Preparation
- 9) Study the hydrolysis of Methyl Acetate using 0.5 N acid solution as catalyst (Relative Strength)
- 10) Determine the energy of activation for hydrolysis reaction of Methyl Acetate using 0.5 N acid solution as catalyst.

BIRSA MUNDA TRIBAL UNIVERSITY, RAJPIPALA.

B. Sc. Chemistry

2nd 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 Mixture.*

(B) Organic (25 marks)

- *Qualitative analysis of an organic Mixture.*

(C) Physical/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.**
- **Perform Three Practical in Two Days**

S.Y.B.Sc.		
SFC201ENG (English-II)		
Units	Contents	Marks
Unit-1.	Selected Poems: <ol style="list-style-type: none"> 1. Humayun to Zobeida (From the Urdu) by Sarojini Naidu. 2. The Solitary Reaper by William Wordsworth. 3. Stopping by The Woods in the Snowy evening by Robert Frost. 	14
Unit-2.	Selected Short Stories: <ol style="list-style-type: none"> 1. A True Story by Mark Twain. 2. The Why-Why Girl by Mahasweta Devi. 3. The Gift of the Magi by O. Henry. 	14
Unit -3.	Study of Novel: <ol style="list-style-type: none"> 1. Uncle Tom's Cabin by Harriet Beecher Stowe. 	14
Unit-4.	Grammar: <ol style="list-style-type: none"> 1. Change the Degree. 2. Change the Voice. 3. Transform the Sentence (Negative, Assertive, Interrogative, Exclamatory etc.) <p>Note: (The meaning of the sentence should not be changed while transforming the sentence.)</p>	14
Unit-5.	Compositions: <p>A. Letter Writing (Formal and Informal Letter)</p> <ol style="list-style-type: none"> 1. Formal Letters. <ul style="list-style-type: none"> • Complaints. • Inquiry. • Request. 2. Informal Letters. <ul style="list-style-type: none"> • Congratulatory. • Consolation. • Invitation. 	14

Reference Books:

1. Uncle Tom's Cabin by Harriet Beecher Stowe.
2. Raymond Murphy's English Grammar in Use.
3. Contemporary English Grammar Structures and composition by David Green.