

LAB ASSISTANT GRADE III CHEMIST & METALLURGIST

Sl No.	Topics	No. of Questions
I.	Basic fundamentals of Mechanical Testing i.e. Tensile Testing, Impact Testing, Load Deflection Testing, Bend Test etc.	4 to 8
II.	Basic knowledge of various types of Equipments & Machines used in testing.	3 to 6
III.	Basic knowledge of materials like Steel, Cast-Iron, Non-ferrous Metals, Rubber, Plastics & Composites.	6 to 8
IV.	a) Estimation of C, Mn, Si, S, P, Cr, Ni & Mo & other elements in Steel & Cast Iron & their effects.	2 to 3
	b) Testing of Non-ferrous Metals & Alloys.	2 to 4
	c) Fundamentals of Electroplating & Testing of various Electro-plated coach components.	2 to 5
V.	a) Painting Schedule in coaches & Paint defects.	2 to 4
	b) Testing of ROZ Primer, Synthetic Enamels & P.U. Paints.	2 to 4
VI.	Testing of Rubber & Rubber products, L.P. Sheets, Wood, Adhesives, PVC, Rexine, Plywood Foam & FRP items.	3 to 6
VII.	Oils & Lubricants: Testing of Oils & Lubricants, Grease etc.	3 to 5
VIII.	Non-Destructive Testing:	
	a) Knowledge of X-Rays testing & Gamma Rays Examination of welding and steel castings. Film Developing & fundamentals of Radiography.	2 to 5
	b) Principles of Ultrasonic Testing.	2 to 4
	c) Magnaflux & Dye Penetrant Testing.	2 to 3
TOTAL		50

DANCE MISTRESS

Sl No.	Topics	No. of Questions
Unit 1 – Folk and Traditional Theatre Forms of India		3 to 8
•	Understanding and defining the terms Tribal, Folk, Traditional and Classical in the context of Indian dance and drama and their interrelation.	
•	Introduction to the different tribal, folk and traditional dance and theatre forms spread over various regions of India.	
•	Introduction to regional theatrical practices of Kudiattam, Yakshagana, Bhagavatamela, Tamasha, Ramalila, Rasalila, Bhavai, Nautanki, Jatra, Chhau, Laiharaoba, Therukoothu, Theyyam, Anki-nat, Chindu Bhagavata, Bhand Jashan and others	
•	Awareness of various musical instruments, costumes and make-up used in these forms.	
Unit 2 - Dance in Sanskrit Literature and Treatises		3 to 8
•	A brief study of references to dance in the works of Kalidasa, Bhasa, Sudraka and others	
•	General understanding of the concepts relating to dance from texts of ancient and medieval period- Natyasastra, Abhinaya Darpana, Sangeeta Ratnakara, Nritta Ratnavali and Nartana Nirnaya. Concepts include Natya, Nritta, Nritya, Lasya, Tandava, Marga, Desi, Baddha, Anibaddha, Nartaki lakshana, Sabha lakshana and the like. Also specific study of the padas, hastas, caris, mandalas and karanas, and anga, upanga and pratyanga movements	
•	Detailed study of Abhinaya Darpana along with introduction to other region/form specific texts like Hasta Lakshana Deepika, Balarama Bharatam, Abhinaya Chandrika, Srihasta Muktavali and others	
•	The various categories and typologies of Nayakas and Nayikas and their avasthas according to Bharat's Natyasastra, Saradatanaya's Bhavaprakasana, Bhanudatta's Rasamanjari and Akbar Shah's Sringaramanjari	
Unit 3 - Indian Classical Dance		5 to 10
•	Origin and history of Indian classical dance	
•	Evolution, technique, costumes, music, Gurus and pioneers of Bharatanatyam, Kathak, Kathakali, Kuchipudi, Manipuri, Mohiniattam, Odissi and Sattriya	
•	General understanding of major Talas of Hindustani and Carnatic music traditions	
•	A brief study of Composers/Vaggeyakaras and their works including Jayadeva, Narayanateertha, Surdas, Meera Bai, Tulasidas, Vanamalidas, Kshetrappa, Srimanta Shankar Deva, Govindadas, Vidyapati, and others.	
•	Study of the role of Rabindranath Tagore, Rukmini Devi Arundale, Vallathole Narayana Menon, Madame Menaka and others in the revival and reconstruction of classical dance	
Unit 4 - Indian Classical Dance in Independent India		4 to 10
•	An overview of major Gurus, performers, their works and important institutions in Independent India	
•	Institutionalization of dance and its effect on form, pedagogy, repertoire etc.	

SI No.	Topics	No. of Questions
•	The new wave in Indian dance – Its development through the works of Uday Shanker and Ram Gopal and the later major contemporary artists and their works. (eg. Shantibardhan, Narendra Sharma, Sachin Shanker, Mrinalini Sarabhai, Maya Rao, Kumudini Lakhia, Manjusri Chaki Sarkar, Chandralekha, Astad Deboo and others)	
•	Indian classical dances in diaspora	
•	Awareness of important dance festivals, awardees and current happenings in dance	
Unit 5 - Dance Education, Pedagogy and Research		5 to 10
•	Dance as part of curriculum in school education and Universities	
•	Movement Analysis based on kinesthetics and Laban system	
•	Eminent scholars and their works, who contributed significantly to the knowledge of Indian dance	
•	Key inroads in dance training and research in India from the 1930's to the present like applied areas of dance, therapy, cross-cultural training etc.	
Unit 6 - International dance and interactions		2 to 4
•	Study of the history and development of classical ballet in Europe, Russia and America	
•	Emergence of Modern Dance in the west and major personalities involved	
•	Influence of the West on Indian dance in terms of production design	
TOTAL		50

LABORATORY ASSISTANT/SCHOOL

Sl No.	Topics	No. of Questions
BIOLOGY		
PART – A		5 to 8
•	General characters of: Algae, Fungi, Lichens, Bryophyta, Pteridophyta, Gymnosperms, and Angiosperms.	
•	Morphology of Angiosperms: Structure and Modification of Root, Stem and Leaf. Structure of flower and seed.	
•	Plant Anatomy: Tissue and Tissue System. Secondary growth.	
•	Plant Physiology: Osmosis, Water Absorption Ascent of sap, Transpiration, Photosynthesis, Respiration, Plant growth and movement.	
•	Environmental Studies: Structure and type of Ecosystem, Energy flow, Biogeo – Chemical Cycle, Ecological Adaptations, Environmental Pollution, Population Ecology, Biodiversity.	
•	Biotechnology: General Account, Recombinant DNA technology, Transgenic Plants and Animal, Ethical Issues, Application of Biotechnology in Agriculture and Medical field.	
•	Economic Importance of Plants.	
•	Cell: Structure (Prokaryotic and Eukaryotic) cell theory and cell Division.	
PART – B		6 to 8
•	Genetics: Mendel's law, General Terminology, Structure of DNA and RNA, Molecular basic of Heredity. Structure of chromosome, sex determination and genetic disorders in man.	
•	Classification of Animal Kingdom: upto Phyla in Non chordates and upto class in chordates.	
•	Digestion Respiration and Excretion in human, Protein, Carbohydrate, Fat, Vitamin and digestive enzyme, Exchange of gases, Aerobic and Anaerobic respiration, Krebs cycle, Glycolysis, Excretory substance. Structure and Physiology of Kidney.	
•	Circulatory and Endocrine System of Human: Structure of Heart, Composition of blood, blood groups, Blood clotting, Lymph glands, Antigen and Antibodies. Endocrine glands and their hormones.	
•	Nervous System of Human: Structure of Brain, Eye and Ear, Structure of Neuron, nerve impulse.	
•	Muscular System: Type of Muscles and Muscle contraction.	
•	Reproductive System in Human and Human Diseases: Structure and Reproductive health. Disease in man caused by Bacteria, Virus, Protozoa, Fungi and Helminths.	
•	Biological Evolution, Economic Importance of Animals.	
PHYSICS		1 to 15
•	Dynamics of Rigid Body: Torque, Conservation of angular momentum, moment of inertia of simple geometrical objects.	
•	Thermodynamics: First & Second law of thermodynamics, heat engines and refrigerators.	
•	Oscillations: Simple harmonic motion & its example. resonance.	
•	Waves: Principle of super-position of waves, Doppler effect.	
•	Electrostatics: Coulomb's law, electric field Gauss's theorem & its applications	

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	<ul style="list-style-type: none"> • Electric Current: Kirchhoff's law, Wheatstone-bridge, meter-bridge, potentiometer 	
	<ul style="list-style-type: none"> • Optics: Microscope & telescope, interference, diffraction & Polarisation, polarimeter. 	
	<ul style="list-style-type: none"> • Atom: Bohr's model of H-atom. 	
	<ul style="list-style-type: none"> • Nuclei: Mass defect, nuclear binding energy, nuclear fission & fusion. 	
	<ul style="list-style-type: none"> • Semi-conductor Electronics: pn junction, transistor, logic gates, diode as a rectifier, zener diode. 	
CHEMISTRY		
Unit – 1 – Periodic Table & Atomic Properties:		2
	<ul style="list-style-type: none"> • Fundamental particles of an atom (electron, proton, neutron) 	
	<ul style="list-style-type: none"> • Rutherford's nuclear model 	
	<ul style="list-style-type: none"> • Quantum Nos. 	
	<ul style="list-style-type: none"> • Pauli's exclusion principle 	
	<ul style="list-style-type: none"> • Aufbau principle 	
	<ul style="list-style-type: none"> • Types of orbital (s, p, d, f) shape of orbital 	
	<ul style="list-style-type: none"> • Hund's rule 	
	<ul style="list-style-type: none"> • Modern periodic table 	
	<ul style="list-style-type: none"> • Variation in atomic properties (Size, ionization, potential, Electron affinity, Electronegativity) 	
Unit – 2 – s-Block & p-Block Elements		2
	<ul style="list-style-type: none"> • General introduction 	
	<ul style="list-style-type: none"> • Electronic configuration 	
	<ul style="list-style-type: none"> • Occurrence 	
	<ul style="list-style-type: none"> • Oxidation states 	
	<ul style="list-style-type: none"> • Trends in Physical & Chemical properties 	
	<ul style="list-style-type: none"> • Inert pair effect 	
Unit – 3 – Chemical Equilibrium		2
	<ul style="list-style-type: none"> • Factors affecting Equilibrium 	
	<ul style="list-style-type: none"> • Reversible and Irreversible reactions 	
	<ul style="list-style-type: none"> • Laws of chemical Equilibrium 	
	<ul style="list-style-type: none"> • Le Chatelier's principle 	
Unit – 4 – Ionic Equilibrium		2
	<ul style="list-style-type: none"> • Acid base equilibrium 	
	<ul style="list-style-type: none"> • Ph Value 	
	<ul style="list-style-type: none"> • Common ion effect 	
	<ul style="list-style-type: none"> • Buffer solutions 	
	<ul style="list-style-type: none"> • Acid Base titration 	
Unit – 5 – Gaseous State		2
	<ul style="list-style-type: none"> • Properties 	
	<ul style="list-style-type: none"> • Boyle's Law 	
	<ul style="list-style-type: none"> • Charles Law 	
	<ul style="list-style-type: none"> • Avogadro's Law 	
	<ul style="list-style-type: none"> • Dalton's Law 	
	<ul style="list-style-type: none"> • Ideal gas equation 	
	<ul style="list-style-type: none"> • Graham's law of diffusion 	
	<ul style="list-style-type: none"> • Kinetic theory of gases 	

Sl No.	Topics	No. of Questions
Unit – 6 – Liquid State		2
•	Properties of liquids	
•	Vapour pressure	
•	Surface tension	
•	Viscosity	
Unit – 7 – Solid State		2
•	Properties of solids	
•	Classification of solids	
•	Unit cells & their types	
•	Packing of crystals	
•	Structure of simple ionic compounds	
Unit – 8 – Solutions		2
•	Solute, Solvent, Solution	
•	Concentration of solutions (Molarity, Normality, Formality, Molality, Mole fraction, weight percent)	
•	Types of solutions (Gas solutions, Liquid solutions, Solid solutions)	
•	Raoult's Law	
•	Ideal & Non-ideal solutions	
•	Colligative properties of solutions	
Unit – 9 – Nomenclature & General Properties of Organic Compounds		2
•	Rules of IUPAC nomenclature	
•	Types of reactions (Substitution, Addition, Elimination)	
•	Electrophiles, Nucleophiles	
•	Inductive effect, Electromeric effect	
•	Resonance, Hyperconjugation, Steric effect	
•	Isomerism (structural & stereo)	
Unit – 10 – Hydrocarbons		2
•	Definition & types of hydrocarbons (Alkane, Alkene, Alkyne, Arene)	
•	Preparation of hydrocarbons	
•	Physical properties	
•	Chemical properties	
TOTAL		50