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**BACHELOR OF SCIENCE
IN
VISION SCIENCES
(5 Years Undergraduate Degree Program)**

**ENTRY TEST SYLLABUS
2026**

SINDH INSTITUTE OF OPHTHALMOLOGY
& VISUAL SCIENCES EYE HOSPITAL
HYDERABAD



(Biology, Chemistry, Physics, English, Logical Reasoning)

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GUIDELINES

In order to standardize the admission process, **the School of Optometry, Sindh Institute of Ophthalmology & Visual Sciences (SIOVS)** has decided to conduct a **uniform entry test** for admission into the BS Vision Sciences program (Session 2026–2027). This ensures that all candidates are given equal opportunity to perform, regardless of their educational background.

Common Curriculum / Syllabus

One of the greatest challenges was to devise a **common syllabus** that encompasses the content taught in pre-medical, while also addressing topics missing from various curricula. The BS Vision Sciences Entry Test syllabus will not favor any group or place another at a disadvantage.

Purpose of the Test

The Entry Test is designed to assess applicants' ability in the following areas at the Intermediate (HSSC/Pre-Medical) level:

- Basic understanding of Biology, Chemistry, Physics, and English.
- Logical and analytical thinking skills.
- Problem-solving ability using fundamental scientific concepts.

Entry Test Format

- Type: Multiple Choice Questions (MCQs), paper-based examination.
- Level: Based on the Intermediate (HSSC/Pre-Medical) curriculum.
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STRUCTURE, WEIGHTAGE AND DIFFICULTY LEVELS

STRUCTURE

- Total number of MCQs: 100
- Duration of Entry Test: 2 hours
- Format: Paper-based MCQs
- Minimum pass marks for Admission: 50%
- **No negative marking**

WEIGHTAGE

WEIGHTAGE

Subject	Percentage	No. of MCQs
Biology	30%	30
Chemistry	20%	20
Physics	20%	20
English	20%	20
Logical Reasoning	10%	10
TOTAL	100	100

DIFFICULTY INDEX

10% MCQs ----- Easy
 50% MCQs ----- Moderate
 05% MCQs ----- Difficult

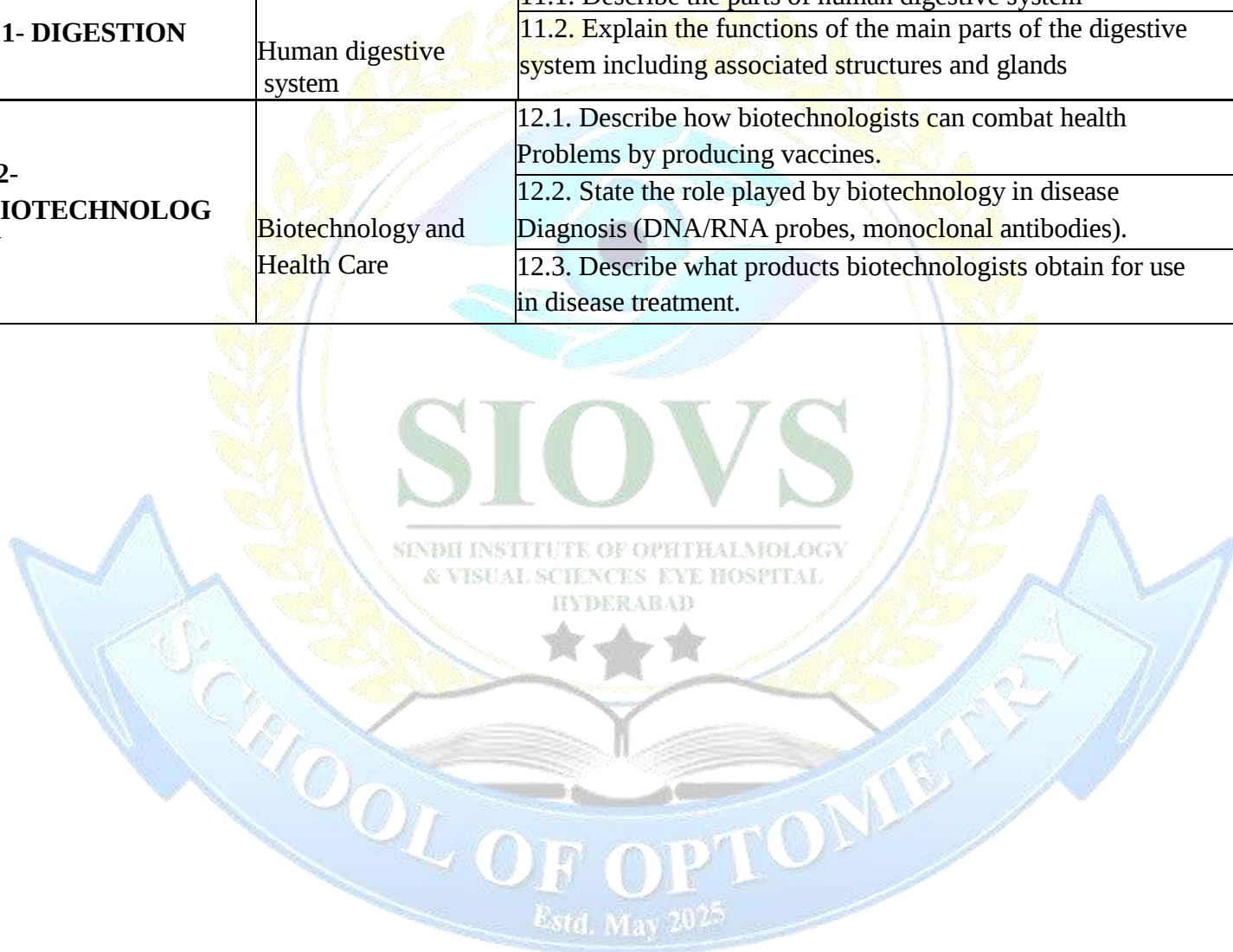
1. BIOLOGY

Unit	Topics/Subtopics	Learning outcomes
1-ACELLULAR LIFE	Viruses	1.1. Classify viruses on basis of their structure/ number of strands/ diseases/ hosts etc.
	AIDS and HIV Infection	1.2. Identify symptoms, mode of transmission and cause of viral disease (AIDS)
2- BIOENERGETICS	Respiration	2.1. Outline the cellular respiration of proteins and fats and Correlate these with that of glucose.
3- BIOLOGICAL MOLECULES		3.1. Define and classify biological molecules.
	Biological molecules	3.2. Discuss the importance of biological molecules
	Biological Importance of Water	3.3. Describe biologically important properties of water (polarity, hydrolysis, specific heat, water as solvent and reagent, density, cohesion/ionization)
	Carbohydrates	3.4. Discuss carbohydrates: monosaccharaides (glucose), oligosaccharides (cane sugar, sucrose, lactose), polysaccharides (starches, cellulose, glycogen)
	Proteins	3.5. Describe proteins: amino acids, structure of proteins
	Lipids	3.6. Describe lipids: phospholipids, triglycerides, alcohol and esters (acylglycerol)
	Ribonucleic acid (RNA)	3.7. Give an account of structure and function RNA
	Conjugated molecules	3.8. Discuss conjugated molecules (glycol lipids, glycol proteins)
	Structure of DNA	3.9. Explain the double helical structure of DNA as proposed by Watson and Crick.
		3.10. Define gene is a sequence of nucleotides as part of DNA, which codes for the formation of a polypeptide.
4- CELL STRUCTURE & FUNCTION	Cell structure	4.1. Compare the structure of typical animal and plant cell
	Prokaryotic and Eukaryotic cell	4.2. Compare and contrast the structure of prokaryotic cells with eukaryotic cells
	Cytoplasmic Organelles	4.3 Outline the structure and function of the following organelles: nucleus, Endoplasmic reticulum, Golgi apparatus a Mitochondria
	Chromosomes	4.4. Describe the structure, chemical composition and function of chromosomes.

1. BIOLOGY

5- COORDINATION & CONTROL/ NERVOUS & CHEMICAL COORDINATION	Receptors	5.1. Recognize receptors as transducers sensitive to various stimuli.
	Neurons	5.2. Explain the structure of a typical neuron (cell body, dendrites, axon and myelin sheath)
		5.3. Define nerve impulse
		5.4. Classify reflexes
		5.5. Briefly explain the functions of components of a reflex arc
	Brain	5.6. Discuss the main parts of the brain (e.g., components of brain stem, mid brain, cerebellum, cerebrum)
		5.7. Describe the functions of each part.
6- REPRODUCTION	Human Reproductive system	6.1. Describe the functions of various parts of the male & female reproductive systems and the hormones that regulate those functions
	Menstrual cycle	6.2. Describe the menstrual cycle (female reproductive cycle) emphasizing the role of hormones
	Sexually transmitted diseases	6.3. List the common sexually transmitted diseases along with their causative agents and main symptoms
7- SUPPORT & MOVEMENT	Human skeleton	7.1. Describe cartilage, muscle and bone
		7.2. Explain the main characteristics of cartilage and bone along with functions.
	Muscles	7.3. Compare characteristics of smooth muscles, cardiac muscles and skeletal muscles
	Skeletal muscles	7.4. Explain the ultra-structure of skeletal muscles
	Muscle contraction	7.5. Describe in brief the process of skeletal muscle contraction
	Joints	7.6. Classify joints
	Arthritis	7.7. Define arthritis
08- CIRCULATION	Human Heart	8.1. Discuss general structure of human heart
	Cardiac cycle and phases of Heartbeat	8.2. Describe the phases of heartbeat.
	Blood Vessels	8.3. List the differences and functions of arteries, veins and Capillaries.
	Lymphatic system	8.4. Describe lymphatic system (nodes, vessels and organs)

09- IMMUNITY	Specific Defense Mechanism	09.1. Define and discuss the functions and importance of specific defense mechanisms.
10- RESPIRATION	Human Respiratory System	10.1. Discuss the functions of main part of respiratory system.
		10.2. Discuss the process of gas exchange in human lungs.
		10.3. Discuss the effect of smoking on respiratory system.
11- DIGESTION	Human digestive system	11.1. Describe the parts of human digestive system
		11.2. Explain the functions of the main parts of the digestive system including associated structures and glands
12- BIOTECHNOLOGY	Biotechnology and Health Care	12.1. Describe how biotechnologists can combat health Problems by producing vaccines.
		12.2. State the role played by biotechnology in disease Diagnosis (DNA/RNA probes, monoclonal antibodies).
		12.3. Describe what products biotechnologists obtain for use in disease treatment.



2. CHEMISTRY

Units	Topics/subtopics	Learning Objectives
1. INTRODUCTION OF FUNDAMENTAL CONCEPTS OF CHEMISTRY	Moles and Avogadro's Numbers	1.1 Construct mole ratios from balanced equations for use as conversion factors in stoichiometric problems.
		1.2 Perform stoichiometric calculations with balanced equations using moles, representative particles, masses and volumes of the gases (at ST).
	Limiting and Excess Reactants	1.3 Explain the limiting reagent in reaction
		1.4 Calculate the maximum number of products produced and the amount of any un-reacted excess reagent
	Yield	1.5 Given information from which any two the following may be determine, calculate the third: theoretical yield, actual yield, percentage yield.
		1.6 . Calculate the theoretical yield and the percent yield when given the balanced equation, the amount of reactants and the actual yield.
2. GASES	Kinetic Molecular Theory	2.1 List the postulates of Kinetic Molecular Theory
		2.2 Describe the motion of particles of the gas according to kinetic theory.
	Standard Temperature and Pressure (STP)	2.3 State the values of standard temperature and pressure (STP)
	Boyle's Law	2.4 Describe the effect of change in pressure on the volume of gas.
	Charles's Law	2.5 Describe the effect of change in temperature on the volume of gas.
	Absolute Zero	2.6 Explain the significance of the absolute zero, giving its value in degree.
	Ideal Gas Equation	2.7 Derive Ideal Gas equation using Boyle's Law, Charle's Law and Avogadro's Law.
	Unit of "R"	2.8 Explain the significance and different units of ideal gas constant.
	Real and Ideal Gas	2.9 Distinguish between Real and Ideal Gases.

3.Liquid	Properties Of Liquids based on Kinetic Molecular Theory	3.1 Describe simple properties of liquids e.g diffusion, compression, expansion, motion of molecules, spaces between them, inter molecular forces and kinetic energy based on kinetic molecular theory.
	Evaporation, Boiling point and Vapor Pressure	3.2 Explain physical properties of liquid such as evaporation, vapor pressure, boiling point
	Hydrogen Bonding	3.3 Describe the hydrogen bonding in H_2O , NH_3 and HF molecules.
	Anomalous behavior of Water	3.4 Anomalous behavior of water when its density shows maximum at 4 degrees Centigrade.
4. SOLID	Crystalline Solids	4.1 Describe crystalline solid
	Factors Affecting the Shape of Ionic Crystals	4.2 Name three factors that affect the shape of the ionic crystals.
	Difference between Ionic and Molecular Crystals	4.3 Give brief description of ionic and molecular crystals.
	Crystal lattice	4.4 Explain the structure of a crystal lattice
	Lattice Energy	4.5 Define Lattice Energy,
5. REACTION KINETICS	Chemical Kinetics	5.1 Define chemical kinetics.
		5.2 Explain the terms: rate of reaction, rate equation.
	Factors affecting rate of reaction	5.3 Explain qualitatively factors affecting rate of reaction.
	Order of Reaction	5.4 Give the order with respect to the reactant, write the rate of law for reaction.
		5.5 Explain the meaning of the term “activation energy” and “activated complex”.
		5.6 Relate the ideas of activation energy and the activated complex to the rate of reaction.
	Rate Constant	5.7 Describe the role of the rate constant in the theoretical determination of reaction rate.
6. THERMO CHEMISTRY AND ENERGETICS OF CHEMICAL REACTION	Thermodynamics	6.1 Define Thermodynamics
	Exothermic and Endothermic Reaction	6.2 Classify reactions as exothermic and endothermic
	Different Terms Used	6.3 Define the terms system, surrounding boundary, state function, heat, heat capacity, internal energy, work done and enthalpy of a substance.
	Internal Energies	6.4 Name and define the units of the Internal energy.

7. CHEMICAL BONDING	VSEPR Theory	7.1 Use VSEPR Theory to describe the shapes of the molecules.
	Hybridization	7.2 Describe the shapes of simple molecules using orbital hybridization.
	Application of VSEPR Theory	7.3 Determine the shapes of some molecules from the number of the bonded pairs.
	Dipole Movement	7.4 Predict the molecular polarity from the shapes of molecules.
	Application of Dipole Movement	7.5 Explain what is meant by the term ionic character of the covalent bond.
		7.6 Describe how knowledge of molecular polarity can be used to explain some physical and chemical properties of the molecules.
	Bond Energy	7.7 Define bond energies and explain how they can be used to compare bonds strength of different chemical bonds.
8. S- AND P- BLOCK ELEMENTS	Properties and their Trends	7.8 Define and explain the terms atomic radii, ionic radii, covalent radii, ionization energy, electron affinity, electro negativity, bond energy and bond length.
	S-, P-, D- & F-Block Elements	8.1 Recognize the demarcation of the periodic table into S-block, P-block, D-block and F-block.
	Reaction of Group I elements	8.2 Describe reactions of Group I elements with water, oxygen and chlorine.
	Reaction of Group II elements	8.3 Describe reactions of Group II elements with water, oxygen and chlorine.
	Reaction of Group IV elements	8.4 Describe reactions of Group IV Elements.
9. FUNDAMENTAL PRINCIPLES OF ORGANIC CHEMISTRY	Definition and Classification of Organic Compound	9.1 Define organic chemistry and organic Compound.
		9.2 Classify organic compounds on structural basis.
	Functional Group	9.3 Define functional group.
	Isomerism	9.4 Explain stereoisomerism and its types.
10. MACRO MOLECULES	Classification of Proteins	10.1 Explain the basis of classification and structure function relationship of proteins.
	Importance of Proteins	10.2 Describe the role of various proteins in maintaining body functions and their Nutritional importance.

3. PHYSICS

Units	Topics/subtopics	Learning Outcomes
1. VECTORS AND EQUILIBRIUM	Addition of Vectors (Rectangular Components)	1.1 Determine the sum of vectors using perpendicular Components
	Product of Vectors (Scalar Product)	1.2 Describe Scalar Product of two vectors in term of angle between them
	Product of Vectors (Vector Product)	1.3 Describe Vector product of two vectors in terms of angle between them.
2. FORCE AND MOTION	Displacement	2.1. Describe displacement.
	Velocity	2.2. Describe average velocity of objects.
	Displacement-time Graph	2.3. Interpret displacement-time graph of objects moving along the same straight line.
	Acceleration	2.4. Describe acceleration
	Uniform and variable acceleration	2.5. Distinguish between uniform and variable acceleration.
	Projectile motion	2.6. Explain that projectile motion is two-dimensional motion in a vertical plane.
	Ideal Projectile	2.7. Communicate the ideas of a projectile in the absence of air resistance.
	Projectile motion (Velocity)	2.8. Explain Horizontal component (V _H) of velocity is constant.
		2.9. Acceleration is in the vertical direction and is the same as that of a vertically free- falling object.
		2.10. Differentiate between the characteristics of horizontal motion and vertical motion
	Projectile motion: Maximum Height Range Time of flight Maximum angle	2.11. Evaluate, using equations of uniformly accelerated motion for a given initial velocity of frictionless projectile, the following issues: a. How much higher does it go? b. How far would it go along the level land? c. Where would it be after a given time? d. How long will it remain in air? e. Determine the parameters for a projectile launched from ground height f. Launch angle that results in the maximum range g. Relation between the launch angles that result in the same range.
	Newton's Laws of motion	2.12. Apply Newton's laws to explain the motion of objects in a variety of context.
	Newton's Second Law and Linear momentum	2.13. Describe the Newton's second law of motion as rate of change of momentum.

	Newton's third law of motion	2.14. Correlate Newton's third law of motion and conservation of momentum.
	Collision	2.15. Solve different problems of elastic and inelastic collisions between two bodies in one dimension by using law of conservation of momentum.
	Momentum and Explosive forces	2.16. Describe that momentum is conservational situations.
	Perfectly elastic collision in one dimension	2.17. Identify that for a perfectly elastic collision, the relative speed of approach is equal to the relative speed of separation.
3- WORK AND ENERGY	Work	3.1. Describe the concept of work in terms of the product of force F and displacement d in the direction of force
	Energy	3.2. Describe energy
	Kinetic Energy	3.3. Explain kinetic energy
	Potential energy	3.4. Explain the difference between potential energy and gravitational potential energy.
	Absolute potential energy	3.5. Describe that the gravitational potential energy is measured from a reference level and can be positive or negative, to denote the orientation from the reference levels.
	Power	3.6. Express power as scalar product of force and velocity.
	Work energy theorem in resistive medium	3.7. Explain that work done against friction is dissipated as heat in the environment.
4- CURRENT ELECTRICITY	Implications of energy losses in practical devices and Efficiency	3.8. State the implications of energy losses in practical devices
	Steady current	4.1. Describe the concept of steady current.
	Ohm's Law	4.2. State Ohm's law.
	Factors on which resistance depends	4.3. Define resistivity and explain its dependence upon temperature.
	Temperature coefficient of resistivity	
	Internal resistance of sources	4.4. Explain the internal resistance of sources and its Consequences for external circuits.
	Maximum power Output	4.5. Describe the conditions for maximum power Transfer.

5- ELECTROMAGNETISM	Magnetic flux density/Magnetic field	5.1. Define magnetic flux density and its units.
	Magnetic flux	5.2. Describe the concept of magnetic flux Φ (Phi) as scalar product of magnetic field(B) and area(A)using the relation $\Phi = B \cdot A = B \cdot A \cdot \cos \theta$.
	Motion of charged particle in magnetic field	5.3. Describe quantitatively the path followed by a charged particle into a magnetic field in a direction perpendicular to the field.
		5.4. Explain that a force may act on a charged particle in a uniform magnetic field.
6 - ELECTROMAGNETIC INDUCTION	Faraday's Law of electromagnetic	6.1. State Faraday's law of electromagnetic induction.
	Lenz's Law	6.2. Account for Lenz's law to predict the direction of an induced current and relate to the principle of Conservation of energy.
	Transformer	6.3. Describe the construction of a transformer and explain how it works.
		6.4. Describe how set-up and step-down transformers can be used to ensure efficient transfer of electricity along cables.
7 - DAWN OF MODERN PHYSICS	Quantum Theory and Radiation	7.1. Explain the particle model of light in terms of photons with energy
	Atomic Spectra	7.1. Describe and explain atomic spectra/ line spectrum
08- ATOMIC SPECTRA	Composition of atomic nuclei	8.1. Describe a simple model for the atom to include protons, neutrons and electrons
	Spontaneous and random nuclear decay	8.2. Identify the spontaneous and random nature of nuclear decay.
09- PHYSICAL OPTICS	Biological and Medical uses of radiation	8.3. Describe biological effects of radiation state and explain the different medical uses of radiation.
	Nature of Light	9.1 Electromagnetic Spectrum
		9.2 Visible lights and Continuous Spectrum
		9.3 Wavelength shift due to Refraction
		9.4 Newton Rings

4. ENGLISH

Competencies-Themes	Learning outcomes
1. READING AND THINKING SKILLS	1.1 Scan to answer short Questions
	1.2 Deduce the meanings of the context
	1.3 Analyze how a writer/poet uses language to apprehend to the senses for figurative Language
2. FORMAL AND LEXICAL ASPECT OF LANGUAGE	2.1 deduce the meaning of difficult words from the context using contextual clues.
	2.2 Explore the use of Synonyms with varying shades of meaning used for irony, parody and satire.
	2.3 Illustrate use of pronoun-antecedent agreement.
	2.4 Illustrate use of tenses.
	2.5 Illustrate use of infinitives and infinitives phrases.
	2.6 Illustrate the use of gerund and gerund phrases.
	2.7 Recognize varying position of adverbs in sentences according to their kinds and Importance.
	2.8 Illustrate use of prepositions of position, time, movements and directions.
	2.9 Use in speech and writing, all the appropriate transitional devices.
	2.10 Illustrate use of all punctuation marks wherever applicable
	2.11 Analyze sentences for different classes and phrases, evaluate how their position in sentences when change meaning and different communication function.
	2.12 Recognize and use sentence in version for various purposes.
	2.13 Use active and passive voice appropriately in speech and writing according to the required communicative function
	2.14 Use direct and indirect speech appropriately in speech and writing according to the required communicative function.
3. WRITING SKILLS	3.1 Proof read and edit their own peers and given text for the error of usage and style.
	3.2 Faulty sentence structure
	3.3 Subject verb agreement
	3.4 Errors of functions and spellings

5. LOGICAL REASONING

Themes	Statements	Learning Outcomes
5.1 CRITICAL THINKING	It is the process of evaluation which uses logic to separate truth from Falsehood, reasonable from unreasonable beliefs.	5.1.1 Develop logical arguments for the statements to be true or false. 5.1.2 Give reasons for the right beliefs. 5.1.3 Identify and critically evaluate false beliefs using logical reasoning.
5.2 LETTER AND SYMBOLS SERIES	These are sequential order of letters, number or both arranged such a way that each term in the series is obtained according to some specific rules. These rules can be based on the mathematical operations, c of letter in an alphabetical order.	5.2.1 Develop arithmetical operations as per numbers. 5.2.2 Develop geometrical progression as per numbers 5.2.3 Develop series/sequential orders as per letter and symbols (according to specific rules).
5.3 LOGICAL DEDUCTIOS	Logical reasoning is the type of thinking in which statements and relation between statements are used in a precise manner to make conclusions that are meant (or implied) by the statements and the relations. Logical deduction is a type of reasoning; It assesses a candidate's ability to use structured thinking to deduce from a short passage which of a number of statements is the most accurate response to a posed question.	5.3.1 Predict new relations on the basis of given relations. 5.3.2 Develop new structure on the basis of information in already drawn structures.
5.4 LOGICAL PROBLEMS	These are the puzzles which require people to use deductive reasoning skills, meaning they need to look at different pieces of information in order to arrive at an answer	5.4.1 Infer result of one problem to resolve another problem. 5.4.2 Develop skills to solve puzzles.
5.5 COURSE OF ACTION	A course of action is the step or administrative decision to be taken for improvement, follow-up or further action to the problem, policy etc. based on the information given in the statement to be true and test-takers should determine which of the suggested courses of action logically follow(s) for the pursuing.	5.5.1 Develop skills to gather different parts of information. 5.5.2 Use information for making decisions. 5.5.3 Judge different courses by using arguments

BEST OF LUCK.....!!!!!!

