THE AIR FORCE SCHOOL

ANNUAL SYLLABUS – 2020-21

SECTION – D

SUBJECT – ENGLISH

S. No.	Name of the Topic	Weightage	Topic which will not be assessed
1.	**READING:** Comprehension passage Note making	Objective: 18 Marks Subjective: 8 Marks	------
2.	**GRAMMAR :** Determiners Tenses	Objective: 8 Marks	------
3.	**WRITING SKILLS:** Notice Posters Letter of complaint Letter of Enquiry Letter Placing an Order Speech Debate	Subjective: 16 Marks	------
4.	**LITERATURE** **HORNBILL** The Portrait of a lady We're not afraid to die Discovering Tut Landscape of the soul Ailing Planet Silk Road **POEMS** A Photograph Laburnum Top Voice of the Rain Childhood **SNAPSHOT** Summer of beautiful… The Address Albert Einstein at School Birth	Objective: 14 Marks Subjective:16 Marks	------

SUBJECT – PHYSICS

S. No.	Name of the Topic/Chapter	Weightage	Topic which will not be assessed
1.	Chapter–2: Units and Measurements Need for	5	

	measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures. Dimensions of physical quantities, dimensional analysis and its applications.		
2.	Chapter–3: Motion in a Straight Line Elementary concepts of differentiation and integration for describing motion, uniform and non- uniform motion, average speed and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment).	5	Frame of reference, Motion in a straight line: Position-time graph, speed and velocity.
3.	Chapter-4:Motion in a Plane Scalar and vector quantities; position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors, relative velocity, Unit vector; resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors. Motion in a plane, cases of uniform velocity and uniform acceleration- projectile motion, uniform circular motion.	6	.
4	Chapter–5: Laws of Motion Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication. Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on a banked road).	7	Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion.
5	Chapter–6: Work, Energy and Power Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces: conservation of mechanical energy (kinetic and potential energies); non-conservative forces: motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.	6	
6	Chapter–7: System of Particles and Rotational Motion	4	Statement of parallel and perpendicular axes

	Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body; centre of mass of a uniform rod. Moment of a force, torque, angular momentum, law of conservation of angular momentum and its applications. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions. Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects (no derivation).		theorems and their applications.
7	Chapter–8: Gravitation universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth. Gravitational potential energy and gravitational potential, escape velocity, orbital velocity of a satellite, Geo- stationary satellites.	7	Kepler's laws of planetary motion,
8	Chapter–9: Mechanical Properties of Solids Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus,	3	Elastic behaviour, shear modulus of rigidity, Poisson's ratio; elastic energy.
9	Chapter–10: Mechanical Properties of Fluids Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes), effect of gravity on fluid pressure. Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its applications. Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise.	9	
10	Chapter–11: Thermal Properties of Matter Thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state - latent heat capacity. thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law, Greenhouse effect.	3	Heat, temperature, Heat transfer-conduction, convection and radiation,
11	Chapter–12: Thermodynamics Thermal equilibrium and definition of temperature (zeroth law of thermodynamics), heat, work and internal energy. First law of thermodynamics, isothermal and adiabatic processes.	3	Heat engine and refrigerator.

	Second law of thermodynamics: reversible and irreversible processes		
12	Chapter–13: Kinetic Theory Equation of state of a perfect gas, work done in compressing a gas. Kinetic theory of gases - assumptions, concept of pressure. Kinetic interpretation of temperature; rms speed of gas molecules; degrees of freedom, law of equipartition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.	2	
13	Chapter–14: Oscillations Periodic motion - time period, frequency, displacement as a function of time, periodic functions. Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a loaded spring-restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period. Free, forced and damped oscillations (qualitative ideas only), resonance.	5	
14	Chapter–15: Waves Wave motion: Transverse and longitudinal waves, speed of travelling wave, displacement relation for a progressive wave, principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes	5	Fundamental mode and harmonics, Doppler Effect

SUBJECT – CHEMISTRY

S. No	UNIT	Weightage	Topic which will not be assessed
1.	Some Basic Concepts of Chemistry	3	Nature of matter, laws of chemical combination, Dalton's atomic theory: concept of elements, atoms and molecules.
2.	Structure of Atom	5	Discovery of Electron, Proton and Neutron, atomic number, isotopes and isobars. Thomson's model and its limitations. Rutherford's model and its limitations
3.	Classification of Elements and Periodicity in Properties	5	Significance of classification, brief history of the development of periodic table,
4.	Chemical Bonding and Molecular Structure	7	Nil

5.	States of Matter: Gases and Liquids	5	liquefaction of gases, critical temperature, kinetic energy and molecular speeds (elementary idea), Liquid State- vapour pressure, viscosity and surface tension (qualitative idea only, no mathematical derivations)
6.	Chemical Thermodynamics	5	Heat capacity and specific heat capacity, Criteria for equilibrium
7.	Equilibrium	6	hydrolysis of salts (elementary idea), Henderson Equation
8.	Redox Reactions	5	applications of redox reactions
9.	Hydrogen	4	Preparation, properties and uses of hydrogen, hydrogen peroxide - preparation, reactions and structure use;
10.	s -Block Elements	5	Preparation and Properties of Some Important Compounds: Sodium Carbonate, Sodium Chloride, Sodium Hydroxide and Sodium Hydrogen carbonate, Biological importance of Sodium and Potassium. Calcium Oxide and Calcium Carbonate and their industrial uses, biological importance of Magnesium and Calcium.
11.	Some p -Block Elements	4	Some important compounds: Borax, Boric acid, Boron Hydrides, Aluminium: Reactions with acids and alkalies, uses. Carbon: uses of some important compounds: oxides. Important compounds of Silicon and a few uses: Silicon Tetrachloride, Silicones, Silicates and Zeolites, their uses.
12.	Organic Chemistry: Some basic Principles and Techniques	8	methods of purification, qualitative and quantitative analysis
13.	Hydrocarbons	8	free radical mechanism of halogenation, combustion and pyrolysis.
14.	Environmental Chemistry	-	Entire chapter

SUBJECT – MATHS

S. No.	Name of the Topic	Weightage	Topic which will not be assessed
	Unit - I : Sets and Functions		
1	**Chapter 1**: Sets	**17**	• Difference of sets • Complement of a set • Properties of Complement

2	**Chapter 2:** Relations and Functions		• Cartesian product of the set of reals with itself to RxRxR • Sum, difference, product and quotient of functions
3	**Chapter 3**: Trigonometric Functions		• General solutions of trigonometric equations of the type: $siny = sina$, $cosy = cosa, tany = tana$
	Unit – II : Algebra		
4	**Chapter 5**: Complex Numbers and Quadratic Equations	**25**	• Polar representation of complex numbers • Square root of a complex number
5	**Chapter 6**: Linear Inequalities		**NIL**
6	**Chapter 7**: Permutations and Combinations		• Derivation of formulae for ${}^{n}P_{r}$ and ${}^{n}C_{r}$
7	**Chapter 9**: Sequences and Series		• Formulae for the following special sums $\sum k, \sum k^2, \sum k^3$
	Unit – III : Coordinate Geometry		
8	**Chapter 10**: Straight Lines	**17**	• Shifting of origin • Equation of family of lines passing through the point of intersection of two lines
9	**Chapter 11**: Conic Sections		• A point, a straight line and a pair of intersecting lines as a degenerated case of a conic section
10	**Chapter 12**: Introduction to Three Dimensional Geometry		**NIL**
	Unit – IV : Calculus		
11	**Chapter 13**: Limits and Derivatives	**12**	**NIL**
	Unit – VI : Statistics and Probability		
12	**Chapter 15**: Statistics	**9**	• Analysis of frequency distributions with equal means but different variances.
13	**Chapter 16**: Probability		• Axiomatic (set theoretic) probability, connections with other theories of earlier classes

SUBJECT – COMPUTER SCIENCE

S no	Unit	Weightage	Topic which will not be assessed
	Unit 1	**10 marks**	-
Ch 1	Computer System Overview	2	Encoding schemes: UTF8, UTF32, concept of cloud

			computing
Ch 2	Data Representation	3	
Ch 3	Boolean logic	5	
	Unit 2	**45 marks**	
Ch 7	Python fundamental	2	-
Ch 8	Data Handling	2	
Ch 9	Flow of control	9	-
Ch 10	String	8	
Ch 11	List	13	-sorting algorithms
Ch 12	Tuple	3	
Ch 13	Dictionaries	8	
	Unit 3	**15 marks**	
Ch 15	Cyber Safety	5	
Ch 16	Online Access and computer security	5	
Ch 17	Society, Law and ethics	5	

SUBJECT – IP

S No	Unit	Weightage	Portion which will not be Assessed
1.	Unit 1 Introduction to computer system	10	-
2.	Unit 2 Introduction to Python	25	While Loop
3.	Unit 3 Database concepts and the Structured Query Language	30	Foreign key. DROP TABLE, ALTER TABLE. , UPDATE, DELETE
4.	Unit 4 Introduction to Emerging Trends	5	

SUBJECT– PHYSICAL EDUCATION

S. No.	Name of the Unit	Weightage	Topic which will not be assessed
1	Unit I: Changing Trends & Career in Physical Education	7	-
2	Unit II: Olympic Value Education	9	-
3	Unit III: Physical Fitness, Wellness & Lifestyle	8	-
4	Unit IV: Physical Education & Sports for CWSN	5	-
5	Unit V: Yoga	8	-
6	Unit VI: Physical Activity & Leadership Training	5	-
7	Unit VII: Test, Measurement & Evaluation	7	-
8	Unit VIII: Fundamentals of Anatomy, Physiology & Kinesiology in Sports	9	-
9	Unit IX: Psychology & Sports	4	-
10	Unit X: Training and Doping in Sports	8	-