



آغا خان یونیورسٹی ایگزامینیشن بورڈ  
AGA KHAN UNIVERSITY EXAMINATION BOARD

Secondary School Certificate  
Examination Syllabus

# Physics

Grades IX - X

(Based on New National Curriculum 2022-2023)

**Part II (Grade X)**

Topics and Sub-Topics	Student Learning Outcomes		Cognitive level <sup>1</sup>		
			R	U	A and beyond
<b>11. Wave Motion</b>	Students should be able to:				
11.1 Oscillatory Motion	11.1.1	define the following: a. amplitude, b. frequency, c. oscillatory motion d. periodic motion, e. time period;	*		
	11.1.2	discuss the factors on which the time period of a simple pendulum depends;			E
	11.1.3	solve word problems related to time period of a simple pendulum;			A
11.2 Wave Motion	11.2.1	define mechanical waves;	*		
	11.2.2	describe wave motion as illustrated by vibrations in rope, a slinky spring and by experiments with water waves;		*	
	11.2.3	describe that waves transfer energy without transferring matter;		*	
11.3 Longitudinal and Transverse Waves	11.3.1	identify transverse and longitudinal waves in mechanical media;		*	
	11.3.2	distinguish between mechanical and electromagnetic waves;		*	

<sup>1</sup>R = Remember, U = Understand, A = Apply and beyond [Apply (A), Analyse (An), Evaluate (E), Create (C)]

Topics and Sub-Topics	Student Learning Outcomes	Cognitive level			
		R	U	A and beyond	
11.4 Characteristics of Waves	11.4.1	define the following terms: a. speed ( $v$ ), b. wavelength ( $\lambda$ ), c. crest, d. trough, e. wavefront, f. compression and rarefaction;	*		
	11.4.2	analyse key characteristics of waves by interpreting graphical representations of waveforms;			An
	11.4.3	derive equation $v = f\lambda$ ;			A
	11.4.4	solve word problems using the relation $f = 1/T$ and $v = f\lambda$ ;			A
11.5 Properties of Waves	11.5.1	define the following terms: a. reflection, b. refraction, c. diffraction;	*		
	11.5.2	describe the properties of waves such as reflection, refraction and diffraction with the help of the ripple tank effect.		*	

Topics and Sub-Topics	Student Learning Outcomes	Cognitive level		
		R	U	A and beyond
<b>12. Sound</b>	Students should be able to:			
12.1 Sound Waves	12.1.1 explain the production of sound waves; 12.1.2 explain that sound waves cannot travel in a vacuum; 12.1.3 describe that the speed of sound depends upon the physical characteristic of a medium; 12.1.4 describe the longitudinal nature of sound waves; 12.1.5 state audible frequency range;	*	*	
12.2 Characteristics of Sound	12.2.1 define the terms ‘pitch’, ‘loudness’ and ‘quality of sound’; 12.2.2 describe graphically the effect of changes in amplitude on loudness and the effect of changes in frequency on the pitch of sound; 12.2.3 define the intensity of sound and state its SI unit; 12.2.4 describe the intensity level of sound and mention its unit; 12.2.5 solve word problems related to the intensity level of sound;	*	*	A
12.3 Echo	12.3.1 describe an echo as the reflection of sound waves; 12.3.2 describe simple experiments to show the reflection of sound waves; 12.3.3 examine a method involving a measurement of distance and time for determining the speed of sound in air;		*	An
12.4 Infra-Sound and Ultra-Sound	12.4.1 describe infrasound with examples; 12.4.2 describe ultrasound with examples;		*	
12.5 Acoustic Protection and Noise Pollution	12.5.1 describe the importance of acoustic protection; 12.5.2 analyse the effects of noise pollution on the environment.		*	An

Topics and Sub-Topics	Student Learning Outcomes	Cognitive level		
		R	U	A and beyond
<b>13. Geometrical Optics</b>	Students should be able to:			
13.1 Reflection of Light	13.1.1 describe with reference to the reflection of light the following terms: a. normal, b. angle of incidence, c. angle of reflection; 13.1.2 state laws of reflection of light; 13.1.3 discuss the relationship of the position of an object with the characteristics of image formed by a plane mirror;	*	*	E
13.2 Refraction of Light	13.2.1 describe with reference to the refraction of light the following terms: a. angle of incidence, b. angle of refraction, c. refractive index; 13.2.2 state laws of refraction of light; 13.2.3 solve word problems of refractive index using the given formulae: a. $\sin \angle i / \sin \angle r$ , b. speed of light in vacuum/ speed of light in the given medium, c. real depth/ apparent depth; 13.2.4 illustrate the passage of light ray through parallel-sided transparent material (glass slab); 13.2.5 illustrate the passage of light through a glass prism;	*	*	A  A A
13.3 Dispersion of Light	13.3.1 explain the dispersion of light by a prism; 13.3.2 explain the scattering of light by the molecules in the air; 13.3.3 state the traditional seven colours of the visible spectrum in order of frequency and in order of wavelength;	*	*	

Topics and Sub-Topics	Student Learning Outcomes		Cognitive level		
			R	U	A and beyond
13.4 Total Internal Reflection	13.4.1	define total internal reflection;	*		
	13.4.2	state the conditions necessary for total internal reflection;	*		
	13.4.3	describe the relation between critical angle and refractive index;		*	
	13.4.4	solve word problems related to the critical angle and refractive index;			A
	13.4.5	describe the use of total internal reflection in: a. optical fibre, b. periscope;		*	
13.5 Image Location by Lens Equation	13.5.1	illustrate the action of thin converging and thin diverging lenses on a parallel beam of light;			A
	13.5.2	draw images by placing objects at different positions in front of convex and concave lens;			A
	13.5.3	differentiate between real and virtual images;		*	
	13.5.4	solve word problems related to the image location by lenses using lens formula;			A

Topics and Sub-Topics	Student Learning Outcomes		Cognitive level		
			R	U	A and beyond
13.6 Power of a Lens	13.6.1 13.6.2	define power of a lens and state its unit; define magnifying power of lens;	* *		
13.7 Double Convex Lens	13.7.1 13.7.2	define least distance of distinct vision; describe the use of a single lens (magnifying glass) with its ray diagram;	*	*	
13.8 Defects in Human Eye	13.8.1 13.8.2 13.8.3	define short-sightedness and long-sightedness; draw ray diagrams to show the formation of images in the eye of an individual with reference to: a. normal vision, b. short-sightedness, c. long-sightedness; describe the correction of short-sightedness and long-sightedness using concave and convex lenses;	*		A
13.9 Gravitational and Acoustic Lensing	13.9.1	define the following: a. acoustic lensing, b. gravitational lensing.	*		

Topics and Sub-Topics	Student Learning Outcomes	Cognitive level		
		R	U	A and beyond
<b>14. Electrostatics</b>	Students should be able to:			
14.1 Electric Charge	14.1.1 define charge and its types; 14.1.2 describe electric charge as an integral multiple of elementary charge (electron); 14.1.3 explain that charging of solids by friction involves only a transfer of negative charge (electrons); 14.1.4 describe production and detection of electric charge; 14.1.5 explain discharging of an insulator by: a. putting it above a flame, b. exposing it to damp conditions;	*	*	
14.2 Electrostatic Force	14.2.1 state that unlike charges attract and like charges repel; 14.2.2 explain Coulomb's law; 14.2.3 solve word problems related to the electrostatic charges by using Coulomb's law;	*	*	A
14.3 Electrostatic Induction	14.3.1 describe the process of electrostatic induction; 14.3.2 explain charging of a conductor by electrostatic induction;		*	

Topics and Sub-Topics	Student Learning Outcomes		Cognitive level		
			R	U	A and beyond
14.4 Applications of Electrostatics	14.4.1	describe the application of electrostatics in electrostatic precipitator and photocopier;		*	
	14.4.2	explain the process of lightning in atmosphere during thunderstorms;		*	
	14.4.3	identify different kinds of electrical lightning includes: a. ball lightning, b. elves, c. ghosts, d. jets, e. pixies, f. sprites, g. trolls;		*	
14.5 Electric Field	14.5.1	define electric field and electric field intensity;	*		
	14.5.2	describe that the direction of an electric field line at a point is the direction of the force exerted on a positive charge at that point;		*	
	14.5.3	draw electric field lines for: a. an isolated positive charge, b. an isolated negative point charge, c. two-point charges having opposite charge, d. two-point charges having identical charge;			A
	14.5.4	explain phenomenon of electrical breakdown with its practical application in: a. corona discharge ozone generator b. gas discharge lamp, c. lightning rod, d. plasma display;		*	

Topics and Sub-Topics	Student Learning Outcomes	Cognitive level		
		R	U	A and beyond
<b>15. Electric Current</b>	Students should be able to:			
15.1 Electric Current	15.1.1 define electric current; 15.1.2 differentiate between conventional and non-conventional current; 15.1.3 differentiate between direct current (D.C.) and alternating current (A.C.); 15.1.4 solve word problems related to electric current using $I = \frac{Q}{t}$ ;	*	*	A
15.2 Conductor and Insulator	15.2.1 distinguish between conductors and insulators; 15.2.2 describe electrical conduction in metals in terms of the movement of free electrons;		*	
15.3 Resistance and Resistivity	15.3.1 define resistance and resistivity with its SI unit; 15.3.2 describe the following factors affecting the resistance of a metallic conductor: a. length of a conductor, b. cross-sectional area of a conductor, c. nature of a conductor, d. temperature of a conductor; 15.3.3 describe the phenomenon of superconductivity in solids; 15.3.4 describe the action of negative temperature coefficient (NTC) in thermistors and light dependent resistors;	*	*	

Topics and Sub-Topics	Student Learning Outcomes	Cognitive level			
		R	U	A and beyond	
15.4 Potential Difference and Electromotive Force (e.m.f.)	15.4.1	define potential difference	*		
	15.4.2	solve word problems related to potential difference using $V = \frac{work}{q}$ ;			A
	15.4.3	compare potential difference and electromotive force;		*	
	15.4.4	state that the e.m.f. of identical power sources connected in parallel is equal to the e.m.f. of one of the sources;	*		
	15.4.5	calculate the total e.m.f. where several power sources are arranged in series;			A
15.5 Ohm's Law	15.5.1	state Ohm's law with its limitations;	*		
	15.5.2	interpret the I-V characteristics graph for a fixed resistor, a filament lamp and a thermistor;			E
15.6 Electrical Power and Joule's Law	15.6.1	define electrical power;	*		
	15.6.2	explain Joule's law in terms of energy dissipated in the resistor;		*	
	15.6.3	solve word problems related to $E = IVt = I^2Rt = V^2t/R$ ;			A
	15.6.4	calculate the total energy cost based on the cost price of kWh;			A
15.7 Electrical Measuring Instruments	15.7.1	state the use of electrical measuring devices; (galvanometer, ammeter and voltmeter)	*		

Topics and Sub-Topics	Student Learning Outcomes		Cognitive level		
			R	U	A and beyond
15.8 Alternating Current (A.C.) and Safety Measures	15.8.1	describe the functions of live, neutral and earth wires in the domestic main power supply;		*	
	15.8.2	state common uses of electricity; (including heating, lighting, battery charging and powering motors and electronic systems);	*		
	15.8.3	describe common electric hazards that can result from malpractice and lack of maintenance; (damaged insulation, overheating cables, damp conditions, excess current from overloading of plugs, extension leads, single and multiple sockets when using a main supply);		*	
	15.8.4	explain the importance of connecting domestic (A.C.) supplies in parallel;		*	
	15.8.5	describe the usage of A.C. in daily life (switches, fuses, circuit breakers);		*	
	15.8.6	explain the safety measures in household electricity.		*	

FOR ANNUAL EXAMINATION 2025 PAPER 01/2025

Topics and Sub-Topics	Student Learning Outcomes		Cognitive level		
			R	U	A and beyond
<b>16. D.C. Circuits</b>	Students should be able to:				
16.1 Series and Parallel Combination of Resistance	16.1.1	describe the characteristics of series and parallel combinations of resistors;		*	
	16.1.2	derive the effective/ equivalent resistance of resistors connected in series and in parallel;			A
	16.1.3	calculate the effective/ equivalent resistance of resistors connected in series, parallel and both;			A
16.2 Circuit Diagram and Circuit Components	16.2.1	define electric circuits;	*		
	16.2.2	draw the circuit diagrams of the following electrical components: a. ammeters, b. batteries, c. cells, d. diodes, e. fuses, f. lamps, g. light-dependent resistors (LDRs), h. light-emitting diodes (LEDs), i. resistors (fixed and variable), j. switches, k. thermistors (NTC only), l. voltmeters;			A
	16.2.3	calculate current, voltage, power and resistance in parts of a circuit or in the whole circuit that includes three resistors.			A

Topics and Sub-Topics	Student Learning Outcomes	Cognitive level		
		R	U	A and beyond
<b>17. Magnetism and Electromagnetism</b>	Students should be able to:			
17.1 Domain Theory	17.1.1 define magnetic and non-magnetic substances; 17.1.2 state domain theory of magnetism; 17.1.3 explain magnetisation and demagnetisation of materials in light of domain theory; 17.1.4 define diamagnetic, paramagnetic and ferromagnetic solids; 17.1.5 compare soft and hard ferromagnetic materials; 17.1.6 describe uses of permanent magnets and electromagnets;	* *	*	
17.2 Magnetic Force and Magnetic Field	17.2.1 define the forces acting between magnetic poles and those between magnets and magnetic materials; 17.2.2 describe the direction of the magnetic field of a magnet at a point; 17.2.3 describe magnetic fields and magnetic lines of forces between the two poles of a magnet; 17.2.4 compare strong and weak magnetic fields; 17.2.5 define magnetic flux; 17.2.6 explain the formation of the Earth's magnetic field;	*    *	* * * *	
17.3 Magnetic Field by Current Carrying Conductor	17.3.1 describe the pattern and direction of the magnetic field due to currents in straight wires and in solenoids; 17.3.2 describe the effect of changing the magnitude and direction of the current on the magnetic field; 17.3.3 describe the magnetic effect of a current in: a. loudspeakers, b. relays in switching circuits;		* * *	

Topics and Sub-Topics	Student Learning Outcomes	Cognitive level			
		R	U	A and beyond	
17.4 Current Carrying Conductor in a Magnetic Field	17.4.1	show that a magnetic force acts on a current-carrying conductor in a magnetic field;			A
	17.4.2	state Fleming's left-hand rule;	*		
	17.4.3	describe the effect on the magnetic force of reversing the direction of current and magnetic field;		*	
	17.4.4	describe the magnetic field patterns between parallel current carrying conductors and relate these to the forces on the conductors;		*	
17.5 Magnetic Torque	17.5.1	describe that a current carrying coil in a magnetic field experiences a torque with the help of Fleming's left-hand rule;		*	
	17.5.2	describe the turning effect is increased by increasing the: <ul style="list-style-type: none"> <li>a. area of a coil,</li> <li>b. electric current,</li> <li>c. number of turns on the coil,</li> <li>d. strength of the magnetic field;</li> </ul>		*	
	17.5.3	describe construction and working of a D.C. motor.		*	

Topics and Sub-Topics	Student Learning Outcomes	Cognitive level		
		R	U	A and beyond
<b>18. Electromagnetic Induction</b>	Students should be able to:			
18.1 Electromagnetic Induction	18.1.1 describe that a changing magnetic field can induce electromotive force (e.m.f.) in a wire or coil; 18.1.2 describe that the magnitude of an induced e.m.f. is affected by the: a. rate of change of the magnetic field or the rate of cutting of magnetic field lines, b. number of turns in a coil;		*	
18.2 Faraday's Law of Electromagnetic Induction and Lenz's Law	18.2.1 state Faraday's law of electromagnetic induction; 18.2.2 describe Lenz's law, setup an experiment to show that an e.m.f. induces with in a coil opposes the change that produces it;	*	*	
18.3 Alternating Current Generator	18.3.1 describe the simple construction and working of an A.C. generator; 18.3.2 interpret graphs of e.m.f. against time for simple A.C. generators;		*	E
18.4 Self and Mutual Induction	18.4.1 define self-induction; 18.4.2 define mutual induction; 18.4.3 describe inductance;	*	*	
18.5 Transformer	18.5.1 describe the construction and the principle of operation of a simple iron-cored transformer; 18.5.2 state the two types of transformers and their uses; 18.5.3 discuss the application of transformer in high voltage transmission; 18.5.4 solve word problem using the transformation equation $\frac{V_s}{V_p} = \frac{I_p}{I_s} = \frac{N_s}{N_p}$ ;	*	*	E A

Topics and Sub-Topics	Student Learning Outcomes		Cognitive level		
			R	U	A and beyond
<b>19. Electromagnetic Waves and Electronics</b>	Students should be able to:				
19.1 Electromagnetic Waves	19.1.1	describe the production, transmission and reception of electromagnetic (EM) waves;		*	
	19.1.2	describe the main regions of the electromagnetic spectrum in order of frequency and order of wavelength with their applications;		*	
	19.1.3	describe the damages caused by electromagnetic radiation;		*	
19.2 Thermionic Emission	19.2.1	explain the process of thermionic emission emitted from a filament;		*	
	19.2.2	describe the simple construction and use of an electron gun as a source of electron beam;		*	
19.3 Cathode Ray Oscilloscope (CRO)	19.3.1	describe the effect of electric and magnetic field on an electron beam;		*	
	19.3.2	describe the basic principle and uses of CRO and make a list of its uses;		*	
	19.3.3	interpret waveforms on oscilloscopes;			FA <sup>2</sup>
19.4 Introduction to Electronics	19.4.1	explain the importance of electronics;		*	
	19.4.2	compare analogue and digital electronics;		*	

<sup>2</sup>FA= Formative Assessment, not to be assessed under examination conditions.

Topics and Sub-Topics	Student Learning Outcomes		Cognitive level		
			R	U	A and beyond
19.5 Digital Electronics	19.5.1	state Boolean algebra;	*		
	19.5.2	convert decimal numbers into binary numbers;			A
	19.5.3	state the basic operations of digital electronics;	*		
	19.5.4	identify and make the symbols for the logic gates; (NOT, OR, AND, NOR and NAND)		*	
	19.5.5	state the action of logic gates in truth table form with two inputs;	*		
	19.5.6	use universal gates (NAND and NOR) to create NOT, OR and AND;			A
	19.5.7	describe the uses of logic gates.		*	

FOR ANNUAL EXAMINATION 2025 AND ONWARDS

Topics and Sub-Topics	Student Learning Outcomes		Cognitive level		
			R	U	A and beyond
<b>20. Atomic and Nuclear Physics</b>	Students should be able to:				
20.1 Structure of Atom	20.1.1	describe that the alpha particle scattering experiments provide evidence for: a. a very small nucleus surrounded by mostly empty space, b. a nucleus containing most of the mass of the atom, c. a nucleus that is positively charged;		*	
20.2 Structure of Nucleus	20.2.1	describe the composition of the nucleus of an atom in terms of protons and neutrons;		*	A
	20.2.2	explain that the number of protons in a nucleus distinguishes one element from the other;		*	
	20.2.3	show various nuclides by using the symbol of proton number (Z), nucleon number (A) and the nuclide notation (X);			
20.3 Isotopes	20.3.1	define isotopes;	*		
	20.3.2	state that an element may have more than one isotope;	*		
	20.3.3	describe the uses of isotopes in: a. diagnosis and treatment of cancer, b. household fire (smoke) alarms, c. irradiating food to kill bacteria, d. measuring and controlling thicknesses of materials, e. sterilisation of equipment;		*	

Topics and Sub-Topics	Student Learning Outcomes		Cognitive level		
			R	U	A and beyond
20.4 Radioactivity	20.4.1	define radioactivity;	*		
	20.4.2	explain that some nuclei are unstable;		*	
	20.4.3	describe the spontaneous and random emission of radiation from a nucleus;		*	
	20.4.4	describe the properties of the three types of radiation ( $\alpha$ , $\beta$ and $\gamma$ );		*	
	20.4.5	explain that an element may change into another element when radioactivity occurs;		*	
	20.4.6	show changes in the composition of a nucleus by symbolic equations when alpha or beta particles are emitted from it;			A
20.5 Background Radiation	20.5.1	explain the existence of background radiation;		*	
	20.5.2	state the sources that make a significant contribution to the background radiation including: a. cosmic rays, b. food and drinks, c. radon gas (in the air), d. rocks and buildings;	*		
20.6 Half Life	20.6.1	explain half-life of a radioactive material;		*	A
	20.6.2	calculate the half-life of radioactive elements;			An
	20.6.3	draw graphs showing decay curves of these elements;			
	20.6.4	describe the process of carbon dating to estimate the age of ancient objects;		*	
20.7 Fission and Fusion	20.7.1	describe nuclear fission and fusion reactions;		*	
	20.7.2	calculate the energy released in the process of nuclear reaction using the equation $E = mc^2$ ;			A
	20.7.3	state the nature of the Sun consisting mostly of hydrogen and helium and radiates most of its energy;	*		

Topics and Sub-Topics	Student Learning Outcomes		Cognitive level		
			R	U	A and beyond
20.8 Safety Precautions	20.8.1	state the effects of ionising nuclear radiations on living things, including cell death, mutations and cancer;	*		
	20.8.2	explain that radioactive materials are moved, used and stored in a safe way, with reference to: <ul style="list-style-type: none"> <li>a. reducing exposure time,</li> <li>b. using shield to absorb radiation,</li> <li>c. increasing distance between source and living tissue;</li> </ul>		*	

FOR ANNUAL EXAMINATION 2026 PAF OIWA

Part II (Grade X)

S. No.	Topic-Wise Practical Activities	Apparatus
<b>Topic 11: Wave Motion</b>		
1	To prove that time period of a simple pendulum is independent of (i) the mass of the pendulum and (ii) the amplitude of the vibration.	Different metallic bobs with a hook, stopwatch, cork, Vernier callipers, thread, iron stand, meter rod, piece of chalk.
2	To study the effect of the change in the length of a simple pendulum on its time period and hence calculate the value of acceleration due to gravity “g”.	A metallic bob with a hook, stopwatch, cork, Vernier callipers, thread, iron stand, meter rod, piece of chalk.
<b>Topic 12: Sound</b>		
3	To measure the length of the resonance column in a resonance tube for different tuning forks.	Resonance apparatus, different tuning forks of known frequencies, thermometer, Vernier callipers, rubber pad, two set squares, beaker.
<b>Topic 13: Geometrical Optics</b>		
4	To verify the laws of refraction of light using a glass slab.	Glass slab, drawing pins, common pins, drawing board, white paper.
5	To trace the path of a ray of light through glass a prism and measure the angle of deviation.	Glass prism, drawing board, common pins, drawing pins, white paper, meter rod.
6	To find the focal length of a convex lens by the parallax method using two pins.	Convex lens, knitting needles, convex lens holder, needle stands, optical bench.

S. No.	Topic-Wise Practical Activities	Apparatus
<b>Topic 15: Electric Current</b>		
7	To verify Ohm's law using a wire as a conductor.	Voltmeter, ammeter, battery, connecting wires, resistance, rheostat.
8	To find the resistance of a galvanometer by the half deflection method.	Galvanometer, high resistance box, fractional resistance box, two key plugs, cell (1.5 V), connecting wires.
<b>Topic 16: D.C. Circuits</b>		
9	To study resistance in a series circuit.	Two resistances, voltmeter, ammeter, key, battery, connecting wires, sandpaper.
10	To study resistance in a parallel circuit.	Two resistances, voltmeter, ammeter, key, battery, connecting wires, sandpaper.
<b>Topic 17: Magnetism and Electromagnetism</b>		
11	To trace the magnetic field lines created due to a current-carrying circular coil.	A circular coil of insulated copper fitted in a board, a white paper sheet (A-4 size), scissors, a compass needle, battery, key plug, rheostat, connecting wires.
<b>Topic 19: Electromagnetic Waves and Electronics</b>		
12	To verify the truth tables of the OR and the AND gates.	DC power supply, OR gate (7432), AND gate (7408), LED indicator module, two key plugs, connecting wires.

**Grade X**

**Table 2: Exam Specifications**

Topic No.	Topics	Marks Distribution			Total Marks
		MCQs	CRQs	ERQs	
11	Wave Motion	2	Total 2 Marks (1 CRQ)		4
12	Sound	2	Total 2 Marks (1 CRQ)		4
13	Geometrical Optics	6		5 Marks Choose any ONE from TWO	11
14	Electrostatics	3			8
15	Electric Current	6		5 Marks Choose any ONE from TWO	11
18	Electromagnetic Induction	3			8
16	DC circuit	2	Total 2 Marks (1 CRQ)		4
17	Magnetism and Electromagnetism	6	Total 3 Marks (1 CRQ)		9
19	Electromagnetic Waves and Electronics	4	Total 3 Marks (1 CRQ)		7
20	Atomic and Nuclear Physics	6	Total 3 Marks (1 CRQ)		9
<b>Total</b>		<b>MCQs 40</b>	<b>CRQs 15</b>	<b>ERQs 10</b>	<b>65</b>
<b>Practical*</b>					<b>10</b>
<b>Total</b>					<b>75</b>

## Examination Structure and Practical Requirements for Grades IX and X

### Theory:

- Multiple Choice Question (MCQ) requires candidates to choose one best/ correct answer from four options for each question. Each MCQ carries ONE mark.
- Constructed Response Question (CRQ) requires students to respond with a short text (few phrases/ sentences), calculations or diagrams.
- Extended Response Question (ERQ) requires students to answer in a more descriptive form. The answer should be in paragraph form, with diagrams where needed, and address all parts of the question.
- Table 1 to 2 contains the mark distribution for each topic.
- There will be two examinations, one at the end of grade IX and one at the end of grade X.
- In each grade, the theory paper will be of 3 hours and will consist of two parts: paper I and paper II.
- Paper I theory will consist of 40 compulsory, multiple choice items. These questions will involve four responses options. The answer sheet for paper I will be provided separately.
- Paper II theory will carry 25 marks and consist of Constructed Response Questions (CRQs) and Extended Response Questions (ERQs). Each extended response question will be presented in an either/ or form.
- The booklet for paper II will serve as an answer script.

### Practical:

- In each grade, practical examination (Paper III) will be conducted separate from the theory paper and will consist of 10 marks.
- Practical examination (Paper III) will be based on the list of practical activities given in the examination syllabus. Schools may design their own practical manuals based on these activities for teaching and learning purpose.
- Practical journal/ portfolio should be developed by students and endorsed by a figure of authority, such as a teacher or principal, and submitted at the time of the practical examination (Paper III).
- It is essential for each school to equip its laboratories with chemicals, instruments, apparatus, specimens etc. according to the requirements of the practical activities. Each school will be responsible to make sure that each student is provided the opportunity to do the practical activities.