aglasem.com

FOR GOA CLASS 10 PREPARATION

Goa Board Class 10 Sample Paper 2027 Science

EXAM	YEAR	TYPE	SUBJECT
Goa Class 10	2027	Sample Paper	Science

SYLLABUS AND CURRICULUM
FINAL EXAM GRADE: 10
Subject: Science DURATION: 180 Min. Max. Marks: 70
ACADEMIC YEAR: 2026-27

The weightage or the distribution of marks over different dimensions of the question paper shall be as follows :

1. Weightage to Learning Outcomes:

Sr.No	Learning Outcomes	Marks	Percentage of Marks
1.	Remembering	21	30 %
2.	Understanding	21	30 %
3	Application	17	24 %
4.	Analysis	4	6%
5.	Evaluation	4	6%
6.	Creativity	3	4%
	Total	70	100

Weightage to Content/Subject Units:

Sr.No. as per old edition	Sr.No. as per revised edition	Units	Marks (Flexibility of ± 1 marks is permitted for each topic, while ensuring that the total marks overall remain within 70)	Deletions
1.	1	Chemical Reactions and Equations	4	No deletion
2.	2	Acids, Bases and Salts	6	No deletion
3.	3	Metals and Non metals	4	No deletion
4.	4	Carbon and its Compounds	6	No deletion
6.	5	Life Processes	7	No deletion
7.	6	Control and Co-ordination	5	No deletion
8.	7	How do Organisms Reproduce?	6	No deletion
9.	8	Heredity	3	No deletion
10.	9	Light-Reflection and Refraction	6	No deletion
11.	10	Human Eye and Colourful world	6	No deletion
12.	11	Electricity	7	No deletions
13.	12	Magnetic Effect of Electric Current	6	No deletion
15.	13	Our Environment	4	No deletion
		Total	**70**	

3. Weightage to Forms of Questions:

Sr.No.	Form of Questions	Marks for each question	Number of questions	Total Marks
1.	Long Answer Type (LA)	4	3	12
2.	Short Answer Type (SA-II)	3	4	12
3.	Short Answer Type (SA-I)	2	14	28
4.	Very Short Answer Type (VSA)	1	18	18
	Total		**39**	**70**

4. The expected time for different types of question would be as follows:

S.No.	Form of Questions	Approx. time for each Question in mins (t)	Number of questions (n)	Approx. time for each form of Questions in mins (n x t)
1	Long Answer Type (LA)	12	03	36
2	Short Answer Type (SA-II)	7.5	04	30
3	Short Answer Type (SA-I)	5	14	60
4	Very Short Answer Type (VSA)	3	18	54
	Total			**150**

As the total time is calculated on the basis of the number of questions required to be answered and the length of their anticipated answers, it would, therefore, be advisable for the candidates to budget their time properly by cutting out the superfluous words and be within the expected time limits.

5. Scheme of Options

(There will be no overall choice, However, there is an internal choice in somequestions.)

6. Weightage to Difficulty level of questions:

S.No.	Estimated difficulty level of question	Percentage
1	Easy	20%
2	Average	60%
3	Difficult	20%

A question may vary in difficulty level from individual to individual, As such, the assessment in respect of each question will be made by the paper setter on the basis of general anticipation from the group as a whole taking the examination. This provision is only to make the paper balanced in its

weightage, rather than to determine the pattern of marking at any stage.

7. Number of Main Questions:

It has been decided to introduce serial wise question number and to do away with sub-question among the questions.

Revised pattern of assessment /grading in science for Grade 10 with effect from the academic year 2025-26:

First Mid Test	First Term	Innovative Test Assignment/Project (Internal Marks)	Final Board Exam	Practical's	Total
marks	marks	marks	marks	marks	marks
20	70	10	70	20	100

Final Board Exam:
Theory 70 marks + practical's 20 marks + Innovative Test (Internal Marks)10 marks

Internal marks, to be sent to the Goa Board, are solely based on an innovative test. This may include activity-based assessments, project work, case studies, or paper presentations.

Distribution of Practical marks in science for Grade 10 examination:

Max. Marks: 20 marks Duration: 1Hour
Long experiment: 10 marks
Short experiment: 5 marks
Journal: 5 marks

DIAGRAMS FOR EVALUATION :

Diagrams for evaluation (6 marks) will be included under the 'Remembering' (Learning Outcome).

(ANNEXURE—1)

Ch. No	Name of Chapter	Title of Diagrams	Fig. No.
1	Chemical reactions and equations	----------	
2	Acids, Bases and Salts	----------	
3	Metals and nonmetals	Electrolytic refining of copper	3.12
4	Carbon and its compounds	A molecule of hydrogen	4.1
		Single bond between two hydrogen atoms	4.2
		Double bond between two oxygen atoms	4.3
		Triple bond between two nitrogen atoms	4.4
		Electron dot structure of methane	4.5
		Electron structure of ethane	4.6 (b) (c)
		Electron dot structure of ethane	4.7
		Complete molecule for two structures of C_4H_{10}	4.8 (b)
		Structure of cyclohexane	4.9
		Structure of benzene	4.10
		Formation of micelle	4.12
6	Life process	Open and closed stomata	6.3 (a) (b)
		Nutrition in amoeba	6.5
		Human elementary canal	6.6
		Excretory system in human beings	6.13
7	Control and coordination	Structure of neuron	7.1 (a)
		Human brain	7.3
8	How do organisms reproduce?	Binary fission in amoeba	8.1

		Budding in hydra	8.4
		Leaf of Bryophyllum with buds	8.5
		Spore formation in Rhizopus	8.6
		Longitudinal section of flower	8.7
		Germination of pollen on stigma	8.8
		Germination	8.9
		Human – female reproductive system	8.11
9	Hereditary	----------	
10	Light –reflection and refraction	Concave and convex mirror	10.2 (a) (b)
		Ray diagram for the image formation by a concave mirror **Note**: (an alternate diagram for 10.7 (f) is given below the table	10.7 (a to f)
		Formation of image by a convex mirror	10.8
		Converging action of convex lens and diverging action of concave lens	10.12 (a) (b)
		The position, size and the nature of the image formed by convex lens for various positions of the object	10.16 (a to f)
		Nature, position and size of the image formed by a concave lens	10.17 (a) (b)
11	The human eye and the colourful world	The myopic eye and the correction for myopia with concave lens	11.2 (b) (c)
		The hypermetropic eye and correction for hypermetropia	10.3 (b) (C)
		Dispersion of white light by a glass prism	11.5

12	Electricity	A schematic diagram of an electric circuit and the symbols of some commonly used components in circuit diagrams	12.1 Table 12.1
		Electric diagram for studying ohms law	12.2
		Resistors in series	12. 6
		Resistors in parallel	12.7
13	Magnetic effect of electric current	----------	
15	Our environment	----------	

Concave Mirror Ray Diagram :

When object is placed between F and P

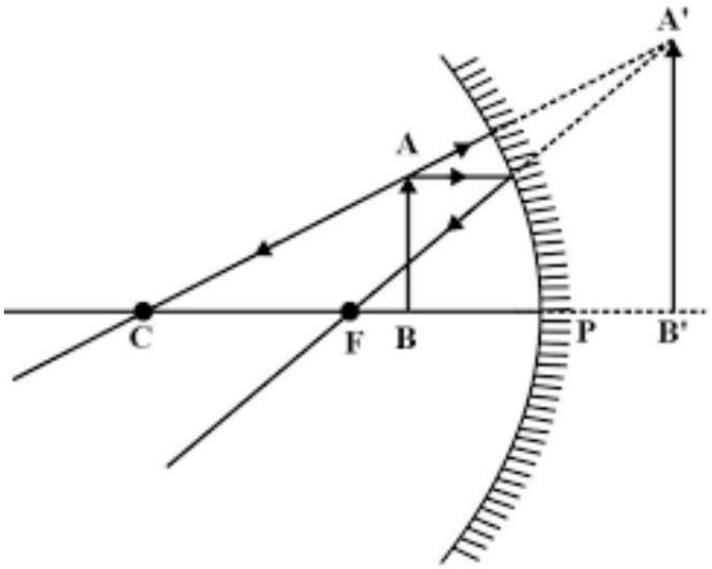


DIAGRAM FOR EVALUATION

(not for drawing)

ANNEXURE –2

Ch. No.	Name of the chapter	Title of the diagram	Fig. no.
1	Chemical reactions and equations	Electrolysis of water	1.6
2	Acids, Bases and Salts	----------	
3	Metals and nonmetals	Action of steam on metal	3.3
4	Carbon and its compounds	----------	
6	Life processes	Human respiratory system	6.9
		Structural view of human heart	6.10
		Schematic representation of transport and exchange of oxygen and carbon dioxide	6.11
7	Control and coordination	Reflex arc	7.2
		Endocrine glands in human beings	7.7 (a) (b)
8	How do organism reproduce?	Regeneration in planaria	8.3
		Human – male reproductive system	8.10
9	Heredity	----------	
10	Light	Refraction of light through a rectangular glass slab	10.10
11	The human eye and colourful world	Human eye	11.1
12	Electricity	----------	
13	Magnetic effect of electric current	Field lines around a magnet	13.4
		A simple electric circuit in which a straight copper wire is placed	13.5 (a)(b)
		A pattern of concentric circles indicating field lines	13.6 (a)

		Flemings left hand rule	13.13
		Current is induced in coil 2 when current in coil 1 is changed	13.17
		Flemings right hand rule	13.18
		A solar cooker	14.6
15	Our environment	Food chain	15.1(a)(b)(c)
		Trophic levels	15.2
		Food web	15.3
		Diagram showing flow of energy in an ecosystem	15.4

GOA BOARD OF SECONDARY & HIGHER SECONDAR EDUCATION, ALTO BETIM-GOA

GRADE 10 BOARD EXAMINATION BLUE PRINT YEAR: 2026-27

DURATION : 3 HOURS **SUBJECT: SCIENCE** **MAXIMUM MARKS: 70** **BLUE PRINT**

Sr.No.	Objective	Remembering				Understanding				APPLICATION				ANALYSIS				EVALUATION				Creativity				TYPE OF QUESTIONS				TOTAL
	CONTENT AREA	VSA	SA I	SA II	LA	VSA	SA I	SA II	LA	VSA	SA I	SA II	LA	VSA	SA I	SA II	LA	VSA	SA I	SA II	LA	VSA	SA I	SA II	LA	VSA	SA I	SA II	LA	
1	Chemical Reaction & Equations	1(1)				1(1)					2(1)															2	1			(3) 4
2	Acid, Bases and salts					1(1)	2(1)			1(1)																2	2			(4) 6
3	Metals and Non metals	1(1)	2(1)			1(1)									2(1)											2	1			(3) 4
4	Carbon and its compounds					*1(1)															4(1)		*1(1)				1		1	(2) 6
5	Life Processes	1(1)					2(1)	*1(1)		1(1)		*2(1)														2	1	1		(4) 7
6	Control and coordinatiion	1(1)	2(1)												2(1)											1	2			(3) 5
7	How do organisms Reproduce?	1(1)				1(1)			4(1)																	2			1	(3)6
8	Heredity	1(1)					2(1)																			1	1			(2)3
9	Light			3(1)						1(1)	2(1)															1	1	1		(3)6
10	Human Eye & colorful world		2(1)			1(1)						3(1)														1	1	1		(3) 6
11	Electricity	1(1)					2(1)						*2(1)											*2(1)		1	1		1	(3) 7
12	Magnetic effect of Elec. Current		2(1)			1(1)						3(1)														1	1	1		(3) 6
13	Our Environment	1(1)	2(1)			1(1)																				2	1			(3) 4
	TOTAL MARKS	8	10	3		7	9	1	4	3	4	8	2		4						4		1		2	18	14	4	3	39 (70)
	TOTAL PERCENTAGE			30% (21)				30%(21)			24%(17)				6%(4)				6%(4)				4%(3)							100%(70)

Please note that the numbers outside the brackets indicate the marks allocated to each question

In the blueprint, the star (*)indicates that the questions are clubbed for 2 marks, 3 marks and for 4 marks

GOA BOARD OF SECONDARY AND HIGHER SECONDARY EDUCATION

ALTO-BETIM, GOA - 403521

ACADEMIC CALENDAR 2026-27

GRADE: 10 **Subject: SCIENCE**

PORTION AND MARKS DISTRIBUTION

	(As per old edition)	(As per Revised syllabus)			(LAB ACTIVITIES)	Hours Approx.
Apr-25	1	1	**Chemical Reactions and Equations**	**4**	I - A	9
					I – B	
	7	6	**Control and Coordination**	**5**	VIII – A	11
Jun-25	12	11	**Electricity**	**7**	IV - A	12
					IV - B (1)	
					IV – B (2)	
					IV – B (3)	
Jun-25	6	5	**Life Processes**	**7**	VIII – B (1)	12
					VIII - B (2)	
Jul-25	2	2	**Acids, Bases and Salts**	**6**	II - A	12
Jul-25	10	9	**Light**	**6**	III – A	14
					III – B (1)	
					III - B (2)	
Aug-25	8	7	**How do Organisms Reproduce?**	**6**	VI - A	16
					VI – B	
					VII – A	
					VII - B	
Sep-25	9	8	**Heredity**	**3**		7
Sep-25	13	12	**Magnetic Effect of Electric Current**	**6**	V – A	13
					V - B	
Nov-25	4	4	**Carbon and its Compounds**	**6**		11
Nov-25	3	3	**Metals and Non metals**	**4**	II - B	11
Dec-25	11	10	**Human Eye and Colourful world**	**6**		10
	15	13	**Our Environment**	**4**		6
			TOTAL	**70**		
			ASSIGNMENT	**10**		6
			Practicals	**20**		
			TOTAL	**100**		**150**

	RUBRICS FOR ASSIGNMENTS/PROJECT (WRITTEN)					SUBJECT : SCIENCE					GRADE:							
CRITERIA	NEATNESS & ORGANIZATION				CONTENT ACCURACY				REQUIRED ELEMENTS				ILLUSTRATION & DIAGRAMS					
ROLL No.	Neatly presented - Very well organised - Makes 100% sense	Neatly presented - Mostly organised - Makes 90% sen	somewhat neatly presented - some parts are organised - makes 50% sense	quite sloppy presentation is very unorganise	information provided is 100% correct, clear and detailed	Information provided is mostly correct and to some extent clear	Information provided are somewhat correct with many mistakes	Information provided are mostly incorrect with lots of mistakes	All necessary information and facts provided	All necessary information is provided	Some information is provided	Necessary information and facts are missing	Diagrams and illustrations are neatly presented with many details	Diagram and illustrations are neatly presented with few details	Diagrams and illustrations are not presented neatly and few details shown	Diagrams and illustrations missing with no details	TOTAL	
	EXCELLENT	GOOD	FAIR	EEDS IMPROVEME	EXCELLENT	GOOD	FAIR	DS IMPROVEM	EXCELLENT	GOOD	FAIR	EEDS IMPROVEME	EXCELLENT	GOOD	FAIR	EEDS IMPROVEMENT		
	2.5	1.5	1	0.5	2.5	1.5	1	0.5	2.5	1.5	1	0.5	2.5	1.5	1	0.5	10	
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		

GRADE :10 **SUB: SCIENCE**

MAPPING SYLLABUS WITH CG, COMPETENCIES, LO'S

CHAPTER	CURRICULAR GOALS CG'S	COMPETENCIES CO's	LEARNING OUTCOMES LO's	PEDAGOGICAL OUTCOMES PO's	REVISED BLOOM's TAXONOMY
Chemical Reactions and Equations	CG-1,	C 1.1, C 1.2, C 1.3	LO1, LO2, LO3, LO4, LO5, LO7, LO8, LO9, LO10,LO11, LO12, LO13, LO15, LO16, LO17, LO18, LO19	PO1, PO2, PO3, PO4, PO5, PO6, PO10, PO13, PO15, PO17	R/U/Ap/An/Ev/Cr
	CG - 7	C7.1			
	CG - 8	**C 8.2**			
Control and Coordination	CG - 3	C 3.1, C3.2	LO1,LO2, LO3, LO4, LO6, LO11, LO12, LO14, LO16, LO17, LO18, LO19	PO5, PO6, PO7, PO13, PO14, PO15, PO17	R/U/Ap/An/Ev/Cr
	CG- 5	C5.2, C5.3			
	CG-8	C 8.2			
Electricity	CG-2	C2.4	LO3, LO6, LO7, LO8, LO9, LO10, LO11, LO12, LO13, LO14, LO15, LO16, LO17, LO18, LO19	PO4, PO5, PO6, PO7, PO9, PO11, PO13, PO14, PO15, PO16, PO17	R/U/Ap/An/Ev/Cr
	CG-8	C8.2			
Life Processes	CG -2.	C2.3	LO1, LO3, LO4, LO5, LO6, LO11, LO12, LO15, LO16, LO17, LO18, LO19	PO1, PO2, PO5, PO6, PO13, PO14, PO15, PO17	R/U/Ap/An/Ev/Cr
	CG - 3	C3.1, C3.2, C3.3,			
	CG - 4	C4.1, C4.2, C4.3			
	CG - 8	C7.1, C7.2			
Acids, Bases and Salts	CG-1	C1.1, C1.2, C1.3,	LO1, LO2, LO3,LO4, LO5, LO7, LO8, LO9, LO10 ,LO11, LO12, LO13, LO15, LO16, LO17, LO18, LO19	PO1, PO2, PO5, PO6, PO8, PO11, PO13, PO14, Po15, PO17	R/U/Ap/An/Ev/Cr
	CG-7,	C7.2			
	CG-8	C 8.2			
Light	CG-2,	C2.3,	LO1, LO5, LO10, LO11, LO13, LO15, LO16, LO17, LO18	PO5, PO9, PO11, PO12	R/U/Ap/An/Ev/Cr
	CG-7,	C7.1, C7.2			
	CG-8	C8.1, C 8.2			
Heredity	CG-3	C 3.1, C 3.2, C3.3, C1.4	LO3, LO11, LO12, LO14, LO15, LO16, LO17,LO18, LO19	PO5, PO6, PO12, PO13, PO14, PO15, PO17	R/U/Ap/An/Ev/Cr
	CG-4	C4.1, C4.2, C4.3			
	CG-8	C8.1, C 8.2			
How do Organisms Reproduce?	CG-3	C3.1, C3.2, C3.3	LO3, LO11, LO12, LO14, LO15, LO16, LO17, LO18, LO19	PO5, PO8, PO10, PO11, PO12	R/U/Ap/An/Ev/Cr
	CG - 4	C4.1, C4.2, C4.3, C4.4, C4.5			
	CG-8	C8.1, C 8.2			

Magnetic Effect of Electric Current	CG-1,	C1.1	LO3, LO4, LO5, LO6, LO8, LO10, LO11, LO12, LO13, LO15, LO16, LO17, LO18, LO19	PO4, PO5, PO6, PO9, PO11, PO13, PO14, PO15, PO17	R/U/Ap/An/Ev/Cr
	CG-2,	C2.2, C2.4, C2.6			
	CG-6,	C6.1			
	CG-7,	C7.1, C7.2			
	CG-8	C8.1, C 8.2			
Carbon and its Compounds	CG-1,	C1.1	LO1, LO2, LO3, LO6, LO7, LO8, LO9, LO10, LO11, LO12, LO15	PO1, PO2, PO5, PO6, PO8, PO13, PO14, PO15, PO17	R/U/Ap/An/Ev/Cr
	CG-7,	C7.1, C7.2			
	CG-8	C8.1, C 8.2			
Metals and Non metals	CG-1,	C1.1, C1.2, C1.3	LO1, LO2, LO3, LO5, LO6, LO7, LO8, LO9, LO9, LO10, LO11, LO12, LO13, LO15	PO1, PO2, PO5, PO6, PO8, PO13, PO14, PO15, PO17	R/U/Ap/An/Ev/Cr
	CG-4,	C4.5			
	CG-8	C8.1, C 8.2			
Human Eye and Colourful world	CG-2,	C2.3	LO1, LO2, LO3, LO4, LO5, LO6, LO7, LO8, LO11, LO12, LO15	PO5, PO6, PO9, PO13, PO14, PO15, PO17	R/U/Ap/An/Ev/Cr
	CG-4,	C4.5			
	CG-6,	C6.1			
	CG-7,	C7.1, C7.2			
	CG-8,	C8.1, C 8.2			
Our Environment	CG-3	C3.1, C3.2, C3.3	LO1, LO2, LO3, LO6, LO11, LO12, LO15	PO1, PO2, PO3, PO5, PO6, PO10, PO13, PO14, PO15, PO16,PO17	R/U/Ap/An/Ev/Cr
	CG-4	C4.1, C4.3			
	CG-8	C8.1, C 8.2			

SECONDARY STAGE (GRADE 9 AND GRADE 10)

CG-1 Explores the world of matter, its interactions, and properties at the atomic level.	**C-1.1** Describes classification of elements in the Periodic Table, and explains how compounds (including carbon compounds) are formed based on atomic structure (Bohr's model) and properties (valency)
	C-1.2 Investigates the nature and properties of chemical substances (distillation, crystallisation, chromatography, centrifugation, types and properties of mixtures, solutions, colloids, and suspensions)

	C-1.3 Describes and represents chemical interactions and changes using symbols and chemical equations (acid and base, metal, and non-metal, reversible, and irreversible)
CG-2 Explores the physical world around them, and understands scientific principles and laws based on observations and analysis.	**C-2.1** Applies Newton's laws to explain the effect of forces (change in state of motion - displacement and direction, velocity and acceleration, uniform circular motion, acceleration due to gravity) and analyses graphical and mathematical representations of motion in one dimension **C-2.2** Explains the relationship between mass and weight using universal law of gravitation and connect it to laws of motion **C-2.3** Manipulates the position of object and properties of lenses (focus, centre of curvature) to observe image characteristics and correspondence with a ray diagram, and extends this understanding to a combination of lenses (telescope, microscope)
	C-2.4 Manipulates and analyses different characteristics of the circuit (current, voltage, resistance) and mathematises their relationship (Ohm's law), and applies it to everyday usage (electricity bill, short circuit, safety measures) **C-2.5** Defines work in scientific terms, and represents the relationship between potential and kinetic energy (conservation of energy) in mathematical expressions **C-2.6** Demonstrates the principle of mechanical advantage by constructing simple machines (system of levers and pulleys) **C-2.7** Describes the origin and properties of sound (wavelength,

	frequency, amplitude) and differences in what we hear as it propagates through different instruments
CG-3 Explores the structure and function of the living world at the cellular level	**C-3.1** Explains the role of cellular components (nucleus, mitochondria, endoplasmic reticulum, vacuoles, chloroplast, cell wall), including the semi-permeability of cell membrane in making cell the structural basis of living organisms and functional basis of life processes **C-3.2** Analyses similarities and differences in the life processes involved in nutrition (photosynthesis in plants; absorption of nutrients in fungi; digestion in animals), transport (transport of water in plants; circulation in animals), exchange of materials (respiration and excretion), and reproduction **C-3-3** Describes mechanisms of heredity (in terms of DNA, genes, chromosomes) and variation (as changes in the sequence of DNA)
CG-4 Explores interconnectedness between organisms and their environment	**C-4.1** Applies the knowledge of cellular diversity in organisms along with the ecological role organisms play (autotrophic/heterotrophic nutrition) to classify them into five-kingdoms **C-4.2** Illustrates different levels of organisations of living organisms (from molecules to organisms) **C-4.3** Analyses different levels of biological organisation from organisms to ecosystems and biomes along with interactions that take place at each level **C-4.4** Analyses patterns of inheritance of traits in terms of Mendel's laws and its consequences at a population level (using models and/or simulations)

	C-4.5 Analyses evidences of biological evolution demonstrating the consequences of the process of natural selection in terms of changes - in allele frequency in population, structure, and function of organisms
CG-5 Draws linkages between scientific knowledge and knowledge across other curricular areas	**C-5.1** Explores how literature and the arts have influenced Science **C-5.2** Examines a case study related to the use of Science in human life from the perspective of Social Sciences and ethics (e.g., Marie Curie, Jenner, treatment of patients with mental illness, the story of the atomic bomb, green revolution and GMOs, conservation of biodiversity) **C-5.3** Applies scientific principles to explain phenomena in other subjects (sound pitch, octave, and amplitude in music; use of muscles in dance form and sports)
CG-6 Understands and appreciates the contribution of India through history and the present times to the overall field of Science, including the disciplines that constitute it	**C-6.1** Knows and explains the significant contributions of India to all matters (concepts, explanations, methods) that are studied within the curriculum in an integrated manner
CG-7 Develops awareness of the most current discoveries, ideas, and frontiers in all areas of scientific knowledge in order to appreciate that Science is ever evolving, and that there are still many unanswered questions	**C-7.1** States concepts that represent the most current understanding of the matter being studied - ranging from mere familiarity to conceptual understanding of the matter as appropriate to the developmental stage of the students **C-7.2** States questions related to matters in the curriculum for which current scientific understanding is well-recognised to be inadequate
CG-8 Explores the nature of Science by doing Science	**C-8.1** Develops accurate and appropriate models (including geometric, mathematical, graphical) to represent real-life events and phenomena using scientific principles

	and use these models to manipulate variables and predict results **C-8.2** Designs and implements a plan for scientific inquiry (formulates hypotheses, makes predictions, identifies variables, accurately uses scientific instruments, --in represents data primary and secondary multiple modes, draws inferences based on data and understanding of scientific concepts, theories, laws, and principles, communicates findings using scientific terminology)

Learning Outcomes : GRADE 10 SUB : SCIENCE

- **Learning Outcomes — Learning Outcomes (LOs) are granular milestones of learning and usually progress in a sequence leading to the attainment of a Competency. These LOs enable Teachers to plan their content, pedagogy, and assessments towards achieving specific Competencies.**

The learner-

LO1: **differentiates materials, objects, organisms, phenomena, and processes, based on, properties and characteristics,** such as, autotrophic and heterotrophic nutrition, biodegradable and non-biodegradable substances, various types of reactions, strong and weak acids and bases, acidic, basic, and neutral salts using different indicators, real and virtual images, etc.

LO2: **classifies materials, objects, organisms, phenomena, and processes, based on properties and characteristics**, **such as**, metals and non-metals, acid and bases on the basis of their physical and chemical properties.

LO3: plans and conducts investigations and experiments to arrive at and verify the facts, principles, phenomena, or to seek answers to queries on their own, **such as**, investigate conditions necessary for rusting, tests the conductivity of various solutions, compares the foaming capacity of different

types of soap samples, verify laws of reflection and refraction of light, Ohm's law, etc. Do variegated leaves perform photosynthesis? Which gas is evolved during fermentation? Why does the shoot of a plant moves towards light?

LO4: **related processes and phenomena with causes and effects**, such as, hormones with their functions, tooth decay with pH of saliva, growth of plants with pH of the soil, survival of aquatic life with pH of water, blue colour of sky with scattering of light, deflection of compass needle due to magnetic effect of electric current, etc.

LO5: **explains processes and phenomena, such as,** nutrition in human beings and plants, transportation in plants and animals, extraction of metals from ores, placement of elements in modern periodic table, displacement of metals from their salt solutions on the basis of reactivity series, working of electric motor and generator, twinkling of stars, advanced sunrise and delayed sunset, formation of rainbow, etc.

LO6: draws labelled diagrams, flow charts, concept maps, and graphs, such as, digestive, respiratory, circulatory, excretory, and reproductive systems, electrolysis of water, electron dot structure of atoms and molecules, flow chart for extraction of metals from ores, ray diagrams, magnetic field lines, etc.

LO7: **analyses and interprets data, graphs, and figures**, such as, melting and boiling points of substances to differentiate between covalent and ionic compounds, pH of solutions to predict the nature of substances, V-I graphs, ray diagrams, etc.

LO8: calculates using the data given, such as, number of atoms in reactants and products to balance a chemical equation, resistance of a system of resistors, power of a lens, electric power, etc.

LO9: uses scientific conventions to represent units of various quantities, symbols, formulae, and equations, such as, balanced chemical equation by using symbols and physical states of substances, sign convention in optics, SI units, etc.

LO10: handles tools and apparatus properly: laboratory measures handles tools and laboratory apparatus properly; measures physical quantities using appropriate apparatus, instruments, and devices, such as, pH of substances using pH paper, electric current and potential difference using ammeter and voltmeter, etc.

LO11: applies learning to hypothetical situations, such as, what will happen if all herbivores are removed from an ecosystem? What will happen if all non-renewable sources of energy are exhausted?

LO12: applies scientific concepts in daily life and solving problems, such as, suggest precautions to prevent sexually transmitted infections, uses appropriate electrical plugs (5/15A) for different electrical devices, uses vegetative propagation to develop saplings in gardens, performs exercise to keep in good health, avoids using appliances responsible for ozone layer depletion, applies concept of decomposition reaction of baking soda to make spongy cakes, etc.

LO13: derives formulae, equations, and laws, such as, equivalent resistance of resistors in series and parallel, etc.

LO14: draws conclusion, such as, traits or features are inherited through genes present on chromosomes, a new species originates through evolutionary processes, water is made up of hydrogen and oxygen, properties of elements vary periodically along the groups and periods in periodic table, potential difference across a metal conductor is proportional to the electric current flowing through it, etc.

LO15: takes initiative to know about scientific discoveries and inventions, such as, Mendel's contribution in understanding the concept of inheritance, Dobereiner for discovering triads of elements, Mendeleev for the development of the periodic table of elements, Oersted's discovery that electricity and magnetism are related, discovery of relation between potential difference across a metal conductor and the electric current flowing through it by Ohm, etc.

LO16: exhibits creativity in designing models using eco-friendly resources, such as, working model of respiratory, digestive, and excretory systems, soda acid fire extinguisher, periodic table, micelles formation, formation of diamond, graphite, and Buckminsterfullerene, human eye, electric motor and generator, etc.

LO17: exhibits values of honesty, objectivity, rational thinking, and freedom from myth and superstitious beliefs while taking decisions, respect for life, etc., such as, reports and records experimental data accurately, says no to consumption of alcohol and drugs, sensitises others about its effect on physical and mental health, sensitises for blood and organ donations, understands the consequences of pre-natal sex determination, etc.

LO18: communicates the findings and conclusions effectively, such as, those derived from experiments, activities, and projects orally and in written form using appropriate figures, tables, graphs, and digital forms, etc.

LO19: makes efforts to conserve environment realising the inter-dependency and inter-relationship in the biotic and abiotic factors of environment, such as, appreciates and promotes segregation of biodegradable and non-biodegradable wastes, minimises the use of plastics, takes appropriate steps to promote sustainable management of resources in day-to-day life, advocates use of fuels which produce less pollutants, uses energy efficient electric devices, uses fossil fuels judiciously, etc.

GRADE :10 SUBJECT : SCIENCE

Suggested Pedagogical Processes

The learners may be provided with opportunities individually or in groups and encouraged to-

PP1: recognise the difference between reactions, such as, exothermic and endothermic, oxidation and reduction, etc.

PP2: observe to understand the difference in the temperatures in both the reactions using laboratory thermometer.

PP3: investigate the ways of segregation of waste material on the basis of their degradation property. They may be encouraged to practice the segregation of waste before disposal at home, school, and public places.

PP4: explore the relationship between two physical quantities, such as, between potential difference across a conductor and electric current flowing through it; design, conduct, and share the findings of an activity

PP5: find out 'why' and 'how' of processes or phenomena, such as, transportation in plants and animals, extraction of metals from ores, with the help of activities, experiments, and demonstration. The learners may be encouraged to discuss, relate, conclude and explain processes or phenomena to their peers using interdisciplinary approach.

PP6: observe diagrams, such as that of digestive system and the names given to various organs. The learners may be motivated to make poster of the digestive system for displaying in school. They may also be provided opportunities to use ICT tools for drawing.

PP7: collect wide variety of graphs from newspapers, magazines, or the internet, with a view to understand the information contained therein. The learners may be facilitated to draw a graph, such as V-I graph for analysing the

relationship between the potential difference across a conductor and the current through it.

PP8: study how chemical equations are balanced using simple mathematical skills. Discussion may be conducted on the significance of balancing of chemical equations.

PP9: get familiar with New Cartesian Sign Convention using illustrated cards and may be given ample opportunities to apply the sign convention in various situations of reflection by spherical mirrors.

PP10: perform a role-play on ecosystem in a hypothetical situation, such as, what will happen if all herbivores suddenly vanish from earth. This may be followed by a discussion about how the loss of biodiversity disrupts the food chain hereby adversely affecting the energy flow in an ecosystem.

PP11: derive equations, formulae, laws, etc. For example, the derivation for formula of the equivalent resistance of resistors in series (or parallel). They should be encouraged to practice the derivation till they are confident.

PP12: study the features inherited through genes, such as, attached or free earlobes. They may be encouraged to observe and compare the earlobes of their friends with the earlobes of their parents and grandparents to arrive at the conclusion that characters or traits are inherited in offsprings from their parents.

PP13: collect print and non-print materials by exploring the library and the internet about scientists and their findings to appreciate how concepts evolved with time. They may be motivated to share their findings by preparing posters and performing role plays or skits.

PP14: encourage learners to visit science museums, biodiversity parks, aviaries, zoological parks, botanical gardens, fisheries, poultry farms, factories, etc.

PP15: collect eco-friendly, commonly available materials to design and develop technological devices and innovative exibits, such as, electric motor, soda acid fire extinguisher, respiratory system, etc. They may be motivated to display their exhibits or models in science exhibitions, science club, classrooms, during parent-teacher meet and to respond to the queries raised during interaction.

PP16: visit classrooms, laboratories, library, toilets, playground, etc., to identify places where wastage of electricity and water may be occurring. Discussion may be held on importance of natural resources and their

conservation, leading to the conviction for adoption of good habits in their day-to-day life. The learners may also organise a sensitisation programme on such issues.

PP17: share their findings of the activities, projects, and experiments, such as, extraction of metals from ores, working of electric motor and generator, formation of rainbow, etc., in oral and written forms. Report writing may be facilitated to share their findings by using appropriate technical terms, figures, tables, graphs, etc. They may be encouraged to draw conclusions on the basis of their observations.

MODEL QUESTION PAPER

Grade : X **TIME: 3 HRS**

SUB: SCIENCE QUESTION PAPER YEAR: 2026-27 MARKS:70

General Instructions

Read the following instructions carefully and follow them:

i. There are 39 questions under sections A, B, C, and D in the question paper. All questions are compulsory.
ii. Question No. 1 to 18 (Sec A) are multiple choice questions carrying one mark each.
iii. Question No 19 to 32 (Sec.B) are short answer type question, carrying 2 marks each
iv. Question No. 33 to 36 (Sec. C) are short answer type questions carrying 3 marks each.
v. Question No.37 to 39(sec D) are long answer type questions, carrying 4 marks each.
vi. There is no overall choice in the question paper. However, an internal choice has been provided for 3 questions of 2 marks, 2 questions of 3 marks and one question of 4 marks. Only one of the choices in such questions has to be attempted.
vii. In addition to this, separate instructions are given for each question wherever necessary.

Section A

Select the correct alternative given below each statement and complete the statement

1. The reaction in which heat energy is absorbed is known as ----------
-

- an exothermic reaction
- a decomposition reaction
- an oxidation reaction
- an endothermic reaction

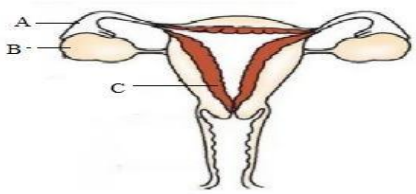
2. When a 4 V battery is connected across an unknown resistor there is a current of 100 mA in the circuit. The value of the resistance of the resistor is :----------

- 0.4 ohm
- 4 ohm
- 40 ohm
- 400 ohm

3. Which of the following is the correct sequence of air passage during inhalation?
   - Nostrils -→ larynx ---→ Pharynx -→ trachea --→ lungs
   - Nostrils -→ trachea --→ pharynx --→ larynx --→ alveoli
   - Larynx -→ nostrils --→ pharynx --→ lungs
   - Nostrils -→ pharynx --→ larynx --→ trachea --→ alveoli

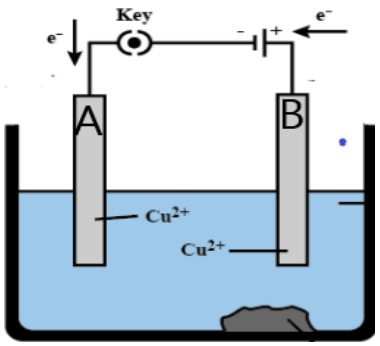
4. Which of the following prepares our body for the action in emergency situation?
   - Testosterone
   - Growth hormone
   - Adrenaline
   - Insulin K

5. In the following diagram, what are the functions of parts A, B and C sequentially?



   - A: makes egg , B: transfers egg to uterus , C: nourishes the foetus
   - A: nourishes the foetus , B: makes egg, C: transfers egg to uterus
   - A: transfers egg to uterus ,B: makes egg , C: nourishes the foetus
   - A: nourishes the foetus, B: transfers egg to uterus , C: makes egg

6 . Consider the following statements in connection with the electrolytic refining of copper



(i) A is pure copper and its cathode
(ii) B is pure copper and its anode
(iii) A is anode and B is cathode but both are pure copper
(iv) Anode B is impure copper whereas cathode A is pure copper

The correct statements are

- (i) and (ii) only
- (ii) and (iii) only
- (i) and (iv) only
- (ii) and (iv) only

7. At the time of short circuit, the current in the circuit ----------

- decreases
- remains constant
- increases abruptly
- becomes zero

8. Calcium Oxide reacts vigorously with water releasing large amount of heat to produce _____.

- Calcium hydride
- Calcium hydroxide
- Calcium carbonate
- Calcium bicarbonate

9. A person cannot see distinctly objects kept beyond 2m. This defect can be corrected using a lens of power :

- +0. 2 D
- -0.5 D
- -0.2 D
- +0.5 D

10. You have three solutions X,Y and Z. The pH of solution 'X' is 6, 'Y' is 7 and 'Z' is 8. The solution having more hydrogen ion concentration is _------

- X
- Y
- Z
- X and Y

11) A sexually transmitted disease caused by bacteria is ____

- Warts
- Gonorrhoea
- Pneumonia
- HIV- AIDS

12 . The significance of transpiration in agriculture is that…….

- it helps to conserve water.
- it increases crop yield
- it regulates temperature
- it reduces soil erosion.

13. To relieve pain and irritation caused due to indigestion, we consume _____.

antiseptics
antibiotics
antagonists
antacids

14. In a food chain the energy available for transfer at different trophic levels is in the form of - - - - - - - - - - - -

- Heat energy
- Light energy
- Mechanical energy
- Chemical energy

15. Mg^{2+} has _____

- 12 protons and 10 electrons.
- 10 protons and 12 electrons.
- 12 protons and 2 electrons.
- 2 Protons and 10 electrons

16. Rasika calculated magnification of an image formed by a spherical mirror . At the end she added a negative sign to the value. This indicates the image formed is

- real and erect
- virtual and inverted
- virtual and erect
- real and inverted
-

Directions: Question numbers 17 and 18 are Assertion – Reasoning based questions: These consists of of two statements – Assertion (A) and Reason (R) Answer these questions selecting the appropriate options given below:

- Both **A** and **R** are true and **R** is the correct explanation of **A.**
- Both **A** and **R** are true and **R** is not the correct explanation of **A** .
- **A** is true but **R** is false.
- **A** is false but **R** is true.

17. Assertion (A): Sex of the children will be determined by what they inherit from their mother.

Reason (R) : Women have XX sex chromosome.

18. Assertion(A) : Sodium oxide is an amphoteric oxide .

Reason (R) : Metal oxides which react with both acids as well as bases are known as amphoteric oxide .

SECTION B

19. $xPb(NO_3)_2 \rightarrow 2PbO + yNO_2 + O_2$

In order to balance the above chemical equation write the value of the coefficient x and y. Identify and name the type of chemical reaction

20. Look at the diagram given below and answer the following question.



What coloured lights are installed at the top of the above towers and why?

Raj is an aeroplane pilot and he uses spectacles of power - O.5 D. What will be the distance of far point of his eye?

21. Draw a ray diagram to show the image formation when an object is placed between F and C of a Concave mirror.

22. Why are heating elements of electric toasters and electric irons made of alloy rather than pure metals ?. Write the relation between ampere and coulomb

23. State the advantages of alternating current over direct current**.** Mention the frequency of AC supply in India along with its unit.

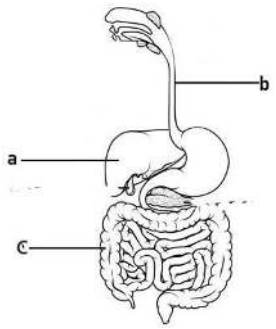
24. How does pH value of mouth influence tooth decay? State one preventive measure.

25. Draw the electron dot structure of methane.

CH_3OH and C_4H_9OH are considered as alcohols. Justify

26. Swimming pools are disinfected using chemical treatment. Name the compound used and write its chemical formula.

27. Refer the given diagram and answer the following questions.



Identify the parts labelled as **'a' and 'b'** and write one function of the part labelled as '**C** '

28. Raja was scared when he suddenly saw a snake while watering the plants. What hormonal responses would occur in his body and why?

29. If one bacterium divides into two, and the resultant two divides again into four, there are only minor differences between them. Why?
Write two examples of inherited traits in human beings.

30. Name the substances that bring about chemical coordination in plants.
A plant kept in shade, bends slowly towards the sunlight. Identify this movement.

OR

30. Write one function of testosterone hormone. Rani is detected with high blood sugar level. Identify the hormone that regulates this condition .

31. Identify the most reactive and least reactive element from those given below
Sodium, Silver, Copper, Zinc, Iron, Lead

In electrolytic refining of Copper what is the anode made of?

OR

31. From the metals given below, identify 2 metals that are found in the native as well as in the combined state.
Copper, Potassium, Silver, Calcium ,Aluminium
How are metal carbonate ores converted into oxides?

32. For the given group of organisms construct a food chain:
Frog, Grass, Insect, Snake.
Write a point of difference between food chain and food web.

OR

32. Arrange the given group of organisms in ascending order of trophic levels.
Fish, Algae, Crocodile, Crane
. Write a point of difference between producers and decomposers

Section C

33.(i) Draw a neat diagram of human excretory system. Label left renal vein and Urinary bladder.

(ii) State scientific reason why the urge to urinate can be controlled.

34. A student sitting far from the black board cannot see the words written on it clearly.

(i) State the defect the student is suffering from .

(ii) How can the above defect be corrected?

(iii) If the far point is less than 80 cm and near point is more than 25 cm. State any one cause of this refractive defect of vision.

35.(i) List two characteristics of an image formed by the convex lens.

(ii) State one use of the convex lens.

(iii) When a ray of light from air enters a water body, which direction will it bend with respect to the normal?

OR

35 (i) List two characteristics of an image formed by the Concave lens.

(ii) State one use of the Concave lens.

(iii) What happens when a ray of light travels from one medium to another having equal refractive indices.

36. Ravi fixes a white sheet of paper on a drawing board. He places a bar magnet in the centre and sprinkles some iron filings uniformly around the bar magnet . Then Ravi taps gently and observes that iron filings arrange themselves in a certain pattern.

(i) Why do iron filings arrange themselves in a certain pattern?

(ii) State two properties of magnetic field lines.

(iii) Why are magnetic field lines crowded towards the pole of a magnet?

OR

36 (i) Two circular coils A and B are placed close to each other . If the current in the coil A is changed, will some current be induced in the coil B? Justify

(ii) How is the type of current that we receive in domestic circuit different from the one that runs a clock?

(iii) The commercial motors use an electromagnet in place of permanent magnet. Why?

Section D

37.(i) A 40 W bulb is rated at 220 V . If 5 such bulbs are lit for 5 hours, calculate the electrical energy.

(ii) Two resistors of 4 ohm and 6 ohm are connected in parallel to a cell , an ammeter, a switch and a voltmeter in the circuit. Draw a labelled diagram showing the above arrangement. Show the direction of flow of current in the above circuit

OR

37.(i) A 100 W lamp and a 200 W lamp are connected to a 220 V electric main supply. Calculate the current drawn by the lamps when connected in series and in parallel.

(ii) Draw circuit diagram to show series combination of three resistors with a battery, an ammeter, a switch and a voltmeter. Show the direction of flow of current in the above circuit

38. A scooter mechanic finds it difficult to clean his oily hands with soap and water at his work place whereas the same soap resulted in better cleaning ac tion at his home

(i) Analyse the cause for effective cleaning of his hands at home

(ii) Suggest a suitable cleansing agent to be used at his work place.

(iii) Why does water alone not clean greasy stains on cloth?

(iv) How do soap micelles help in cleaning clothes?

39. (i) Write one point of distinction between mode of reproduction in rose and bryophyllum plants.

(ii) Why are flowers of papaya and cucumber called as unisexual ?

(iii) State the important role played by pollen tube in flowering plants .

(iv) Why are spores of rhizopus covered with thick walls?