

## CONTENT DEVELOPMENT AND CLASSIFICATION OF TEST ITEMS

### TABLE OF SPECIFICATION

#### CONTENT AREAS FOR PHYSICS

S/N	CONTENT AREA(S)	COMPETENCIES	DESCRIPTIVE STATEMENTS
1.	MATTER AND MOTION	<ul style="list-style-type: none"><li>Demonstrate the importance of making accurate measurements of physical quantities and their applications in science and technology</li></ul>	<ol style="list-style-type: none"><li>Determine the simple structure of solids, liquids and gases</li><li>Understand that all physical quantities consist of a numerical magnitude and a unit</li><li>Determine proper use of measuring instruments</li><li>Differentiate between basic and derived quantities and their units</li><li>Explain the uses of dimensional analysis in terms of the relationship between basic and derived quantities.</li><li>Explain how pressure changes with depth in a fluid</li><li>Discuss Pascal principle and the transmission of pressure in fluids</li><li>Use the gas laws to determine the relationship between temperature, pressure and volume.</li><li>Use the equation of motion to determine displacement, velocity, acceleration and time</li><li>Interpret graphical representations of linear motion.</li><li>Explain the applications of circular motion</li><li>Understand simple harmonic motion (SHM) and examine the relationship between the period of oscillation and; (a) Length of a simple pendulum</li></ol>

			<p>(b) Mass of a loaded spring.</p> <ol style="list-style-type: none"> <li>13. Differentiate between various types of forces</li> <li>14. Differentiate a scalar quantity and a vector quantity</li> <li>15. Verify the principle of moments using a lever</li> <li>16. Determine the principle of moments of a body in equilibrium</li> </ol>
2.	<p>MECHANICAL ENERGY AND HEAT</p> <p>L1 2 L2 5 L3 5 L4 2</p>	<ul style="list-style-type: none"> <li>• Understand the various forms of energy resources and the ways to harness the renewable sources of energy.</li> </ul>	<ol style="list-style-type: none"> <li>1. Determine the forms of energy</li> <li>2. Differentiate between the sources of energy on the environment and carbon cycle</li> <li>3. Describe energy conversion and transformation.</li> <li>4. Explain the concept of work in terms of product of force and distance moved in the direction of the force</li> <li>5. Explain thermal expansion of solids, liquids and gases</li> <li>6. Explain heat capacity, specific heat capacity and describe the methods for measuring them.</li> <li>7. Determine the effect of change in the temperature on the volume of a fixed mass of gas at constant pressure</li> <li>8. Determine the specific latent heat of fusion and vaporization</li> </ol>
3.	<p>WAVES</p> <p>L1 1 L2 2 L3 4 L4 4</p>	<ul style="list-style-type: none"> <li>• Understand and appreciate the principles underlying the production, transmission and applications of sound.</li> </ul>	<ol style="list-style-type: none"> <li>1. Understand that wave transmit energy as they travel through media or vacuum</li> <li>2. Describe a wave motion and explain its measurable properties.</li> <li>3. Use the progressive wave equation to solve simple problems.</li> <li>4. Explain the properties of waves</li> <li>5. Explain focal length and the power of lenses</li> <li>6. Discuss the images formed by lenses.</li> </ol>

			<ol style="list-style-type: none"> <li>7. Determine the focal length of a converging lens</li> <li>8. Explain the structure and operation of some optical instruments</li> <li>9. Describe the defects of lenses and their corrections.</li> <li>10. Describe the production and nature of sound by vibrating sources.</li> <li>11. Describe the frequency ranges of sound.</li> <li>12. Explain modes of vibration in pipes, end correction and resonance.</li> <li>13. Outline the characteristics of musical notes</li> <li>14. Explain the concept of Doppler effect of sound.</li> <li>15. Describe the main features and uses of electromagnetic waves.</li> </ol>
4.	FIELDS	<ul style="list-style-type: none"> <li>• Demonstrate an understanding on the effects of gravitational field and electromagnetic fields on conductors and current-carrying conductors.</li> </ul>	<ol style="list-style-type: none"> <li>1. Explain gravitational field and state Newtons' universal law of gravitation</li> <li>2. Explain the term satellites and distinguish between artificial and natural satellites</li> <li>3. Explain gravitational potential and escape velocity.</li> <li>4. Classify materials as conductors, insulators, and semi-conductors.</li> <li>5. Describe the structure and operation of capacitors.</li> <li>6. Deduce the relationship between the potential gradient and the electric field intensity</li> <li>7. Explain capacitance</li> <li>8. Explain the factors that affect the resistance of a conductor</li> <li>9. Describe the functions of resistance in a circuit</li> <li>10. Describe the connection between voltage, current, energy and power.</li> </ol>

			<ol style="list-style-type: none"> <li>11. Explain how shunt and multipliers can be used to convert galvanometer into an ammeter and a voltmeter.</li> <li>12. Describe the principle of operation and the use of ammeter, potentiometer, voltmeter and wheatstone bridge and meter bridge</li> <li>13. Distinguish among a magnet, magnetic and non-magnetic materials</li> <li>14. Describe the processes involved in magnetization and demagnetization.</li> <li>15. Explain why ferromagnetic materials always attract magnets of either pole</li> <li>16. Describe the uses of magnets and ferromagnetic materials</li> <li>17. Describe magnetic field.</li> <li>18. Investigate the factors that affect the strength of a magnet produced by electrical method.</li> <li>19. Explain the concept of electromagnetic field.</li> <li>20. List and explain the factors that affect the magnetic force on current-carrying conductor in a uniform magnetic field</li> <li>21. Discuss and apply the concept of laws of EM induction in real life</li> <li>22. Determine the factors that affect the magnitude of an induced emf.</li> </ol>
5.	ATOMIC AND NUCLEAR PHYSICS	<ul style="list-style-type: none"> <li>• Demonstrate an understanding on the structure of the atom.</li> </ul>	<ol style="list-style-type: none"> <li>1. Explain thermionic emission and describe its applications.</li> <li>2. Describe the nature, production and uses of cathode rays.</li> </ol>

			<ol style="list-style-type: none"><li>3. Outline the properties, types and characteristics of x-ray</li><li>4. Explain the uses and hazards of x-rays.</li></ol>
--	--	--	--

**DEPTH OF KNOWLEDGE FOR SHS PHYSICS**

S/N	CONTENT AREAS	SUBJECT OUTCOMES			
		Level 1 Remembering (Recall)	Level 2 Understanding (Skill/Concepts)	Level 3 Applying (Strategic-Thinking)	Level 4 Evaluating (Critical-Thinking)
1	Matter and Motion	2	4	4	0
2	Mechanical Energy and Heat	2	5	3	0
3	Waves	1	2	4	0
4	Fields	2	2	5	0
5	Atomic and Nuclear Physics	2	2	2	0
	<b>Total</b>	<b>15%</b>	<b>25%</b>	<b>30%</b>	<b>0%</b>