APPENDIX - I

SYLLABUS OF THE SUBJECT PHYSICAL SCIENCE
(Specifically General Physics Content Units)
(for Class - IX)

The syllabus of the subjects Physical Science - (i)
Common to both Physics and Chemistry, (ii) Physics, as stated
in the "Volume-I" of the curriculum and syllabus for Reorganised Pattern of Secondary Education (Classes VI-X) from 1974
and subsequently revised in 1979, by West Bengal Board of
Secondary Education is as given below:

The relevant portions of the syllabus which were chosen
as content units of General Physics for the construction of a
'Test' in General Physics were marked - (*).

(i) Common to both Physics and Chemistry:

(*) 1. Systems of measurement: Different Physical quantities
and their units - Fundamental Units and Derived Units.
F.P.S. and C.G.S. units and relation between the two
units of length and mass. Advantages of C.G.S. system
or Metric system to be emphasized. Reasons for using
different sized units for measuring a particular quant-
ity to be explained. Importance of mentioning tempera-
ture and purity of metals in defining standards of
length to be stated.
Measuring devices: Ordinary scale, common balance, measuring cylinders, clocks - Elementary idea of sensitivity of a common balance. For measurement of small time interval the use of stop-clocks or stop-watches are to be explained.

(*) 2. Matter and energy - deleted. For "energy", vide item No. 2 of Physics of Class - IX.

Mass and Weight - Distinction between mass and weight. Mass is measured by common balance while weight is measured by spring balance.

Conservation of mass - Some experiments should be shown and explained. Conservation of energy. Different forms of energy. Transformation of energy (non-quantitative treatment) - Different forms of energy like heat energy, light energy, sound energy, electrical energy etc. Conservation of energy. Transformation of energy in every day life to be explained. Sun is the most important source of energy on earth.

3. Change of State Freezing, melting, boiling, evaporation and condensation. Melting point and boiling point. Factors affecting them - Constancy of temperature during melting and boiling should be demonstrated by simple experiment. Effect of pressure on boiling and melting points should be discussed. Cutting of ice by a metallic wire to be demonstrated. Principle of pressure cooker to be explained. Distinction between boiling and evaporation to be explained. Condensation should be demonstrated by holding a cold plate in front of the nozzle of a kettle in which
water is boiling. Formation of dew, fog and cloud should be explained clearly.

Idea of latent heat - Cooling by evaporation due to latent heat to be demonstrated by pouring ether or methylated spirit on the hand.

Distinction between volatile and non-volatile compounds should be discussed. Cooling of water in an earthen pitcher should be explained. Explanation of other simple cases like cooling of roads, floors, roofs etc by pouring water.

PHYSICS

(*) 1. Rest and motion - Rest and motion with respect to some fixed body. Stress should be given to the point that objects which we observe at rest or moving is a relative term.

Displacement, speed, velocity and acceleration - Definitions and illustrations. Distinction between speed and velocity to be explained. Idea of acceleration, positive or negative, may be introduced from the example of a train gaining speed after start or losing speed before coming to a halt. Units of velocity and acceleration. Simple numerical examples in calculating velocity and acceleration to be discussed. Idea of average speed required. Estimation of distance from velocity and time.
Newton's laws of motion. Definition of force
(Equations of motion excluded. Rotational motion excluded).
Concepts of momentum and force from everyday experience to be explained. Inertia of rest and inertia of motion to be discussed. Force of reaction with various examples and its application in modern jet planes to be explained.

(*) 2. Work, Energy and Power - Potential and kinetic energy. Units (Nosum) - Definitions of work, energy, power and explanation with suitable examples. Relation between power and work. Students should be encouraged to devise simple experiments on the rotation of a wheel by flow of water or wind. Concept of energy may be demonstrated with the help of spring.

Simple machine, Inclined plane, wheel and axles and levers (not mathematical) - These topics should be explained by actual demonstrations.


Factors determining the quantities of heat - The idea of specific heat to be given. Idea of heat lost = heat gained to be stated. Dependence on mass, specific heat and difference of temperature to be discussed.
Heat as a form of energy. Relationship with work - Production of heat by rubbing to be discussed and conversion of mechanical work into heat to be discussed and explained. "For production of one calorie of heat $4.18 \times 10^7$ ergs of mechanical work is to be done" - should be stated.

4. **Source of Light.** Ray of light. Reflection of light - Reflection on sunlight with a plane mirror should be demonstrated. Laws of reflection and its verification by plane mirror and pins. Regular and diffused reflection, by regular reflection image is formed. By diffused reflection the reflecting surface is seen, but no image is formed.

**Refraction of Light** - Phenomenon of refraction, bending of rays towards the normal and away from the normal. Some natural phenomena depending on refraction (Laws of refraction need not be discussed).

Total internal refraction. Explanation of some natural phenomena on the basis of refraction and total refraction - conditions of total internal reflection and demonstration in suitable natural phenomena. Explanation of mirage in desert essential (Mirage in cold region excluded). Propagation and velocity of light - simple idea of velocity of light and its high value.
Convex lens and its focussing action. Focal length.
Convex lens as a magnifying glass - idea of a focal length of a convex lens by focussing the image of distant object on a wall (First Principal focus need not be discussed). Magnifying properties to be demonstrated. Distinction between real and virtual image to be discussed.

Dispersion of light. Spectrum (Demonstration) - Demonstration of the formation of spectrum with prism essential. VIBGYOR colours with white light.

CHEMISTRY

Not stated, being out of the perview of this research project.