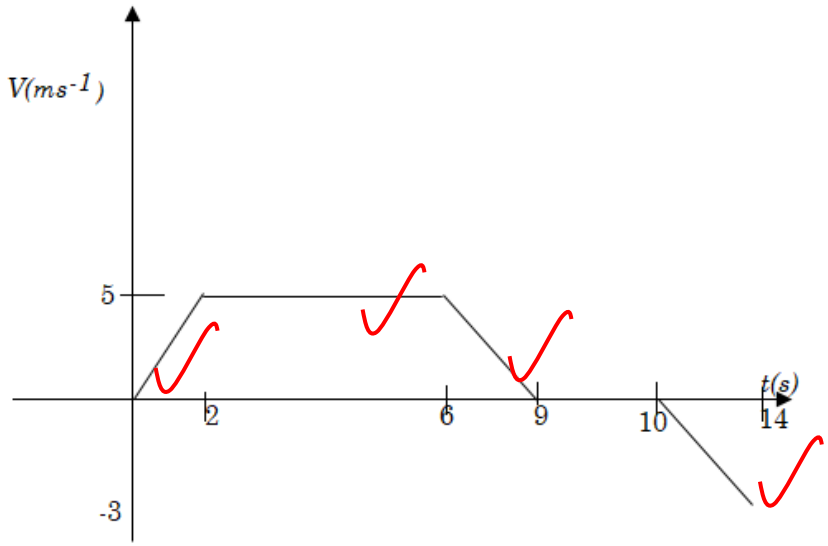
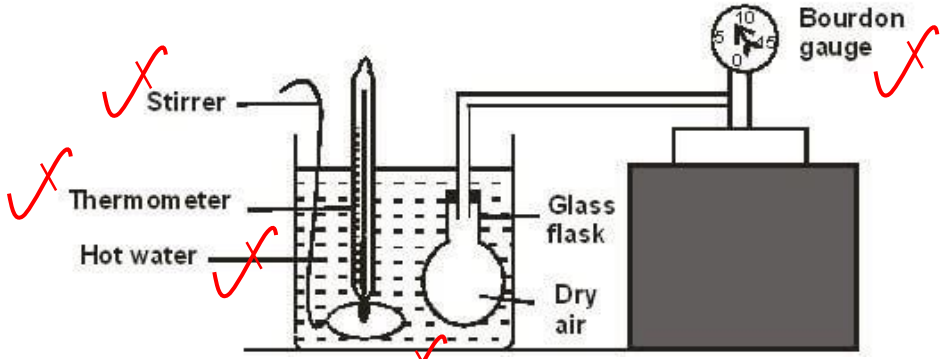
MATIGO EXAMINATIONS BOARD

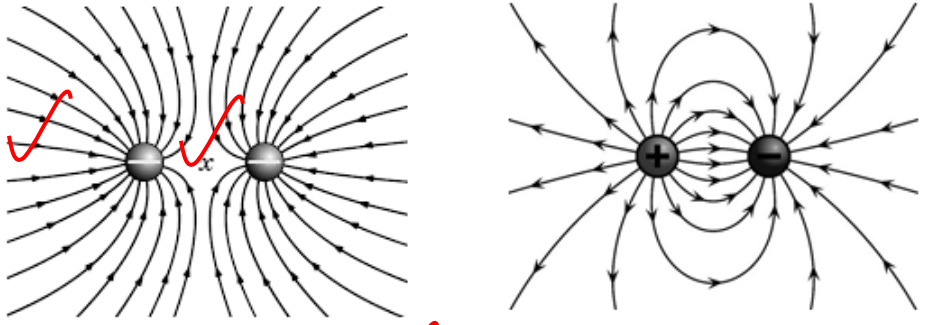
535/2
PRE MOCK PHYSICS
MARKING GUIDE 2023
PAPER 2

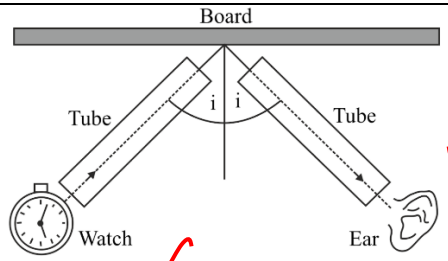
<table>
<tr><th>Qn</th><th>Answers</th><th>marks</th></tr>
<tr><td>1(a)(i)</td><td>Liquids and gases</td><td>01</td></tr>
<tr><td>(ii)</td><td><table><tr><td>Liquid</td><td>Gases</td></tr><tr><td>Molecules are close</td><td>Molecules are far apart</td></tr><tr><td>Take shape of container</td><td>No shape</td></tr><tr><td></td><td></td></tr></table></td><td>02</td></tr>
<tr><td>(b)(i)</td><td>• Diffusion is the movement of molecules from high concentration areas to low concentration areas
• Capillarity is the rise or fall of liquid in narrow tube</td><td>02</td></tr>
<tr><td>(ii)</td><td>• Coloured gas is put in transparent beaker
• Another beaker is inverted on it
• After some time coloured gas spreads and fills the inverted beaker</td><td>04</td></tr>
<tr><td>(iii)</td><td>Advantages of capillarity
• Drying objects using towels
• Fuel moving in lamp wick
• Water moving up a plant from soil</td><td>02</td></tr>
<tr><td>(c)(i)</td><td>$W = mg = 12 \times 8 = 96N$</td><td>03</td></tr>
</table>

(ii)	As latitude increases, acceleration due to gravity reduces since W varies with g, weight reduces	**02**
2(a)	• Everybody remains at rest or uniform motion in a straight line unless acted upon an external force. • The rate of change of momentum is proportional to force applied and acts in the direction of force • For every action, there is an equal but opposite reaction.	**03**
(b)(i)		**04**
(ii)	$Total\ distance = Area\ under\ the\ curve$ $= \frac{1}{2}(9+4) \times 5 + \frac{1}{2} \times 4 \times 3$ $= 32.5 + 6$ $= 38.5m$	**03**
(iii)	$Total\ displacement = \frac{1}{2}(9+4) \times 5 - \frac{1}{2} \times 4 \times 3$ $= 32.5 - 6$ $= 26.5m$	**02**
(c)	• Fuel is burnt with oxygen • High speed gases are produced • The hot gases expelled through the exhaust • They exert equal but opposite momentum on the rocket; hence forward motion of rocket.	**04**

3(a)(i)	Sand, cement, small stones, water	**02**
(ii)	**Advantages of concrete** • Durable • Weather resistant • Fire resistant • Strong under tension	**02**
(iii)	**Advantages of glass** • Its cheap • Poor conductor of heat • Readily available • Easy to use	**02**
(b)(i)	Extension of an elastics material is proportional to force applied provided elastic limit is not exceeded	**01**
(ii)	• Spring with pointer is suspended on stand with ruler • Initial pointer position is noted • Mass is suspended on the spring • Final pointer position is noted • Extension e is calculated • Procedure is repeated for different masses • Results obtained are tabulated • A graph of m against e is plotted • Slope of the graph is determined • Slope = constant	**05**
(c)(i)	$K = \frac{F}{e}$ $= \frac{5 \times 10}{0.02}$ $2500 Nm^{-1}$	**02**
(ii)	$e = \frac{F}{K}$ $= \frac{3 \times 10}{2500} = 0.012m = 1.2m$	**02**

4(a)(i)	Fundamental interval is the difference between the upper and lower fixed points	**01**
(ii)	• Upper fixed point is determined • Lower fixed point is determined • Fundamental interval is the found • The fundamental interval is divided into 100 equal divisions each division is 1°C	**04**
(b)	• Water is colourless, not easy to read • Water has high heat capacity • Water expands abnormally • Water sticks on glass	**02**
(c)(i)	It states that pressure of a fixed mass of a gas is directly proportional to its absolute temperature provided volume is kept constant.	**01**
(c)(ii)	 • Enclosed gas is placed in a water bath • Initial temperature T and pressure are noted • Water is heated • Procedure is repeated for different temperatures • Table of results is made • Graph of p against T is plotted • Its straight line graph hence pressure law	**05**
(d)	$\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$ $V_2 = \frac{P_1V_1T_2}{T_1P_2}$	**03**

	$= \frac{800 \times 250 \times 273}{273 \times 760}$ $= 263.2cm^3$	
5(a)(i)	A conductor allows electrons to flow easily. Insulator do not allow electrons to flow	**02**
(ii)	Like charges repel Unlike charges attract	**01**
(b)	• Body is placed on an insulating stand • Negative inducing rod is placed close to the body • The body is then earthed • With rod in position, earthing is removed • Inducing rod is then removed and the body becomes positively charged	**05**
(c)	• Negatively charged cloud passes over the spikes • It induces a positive charge on the spikes • A strong field is created around the spikes • The field ionises air around • Positive charges are repelled to the cloud, thus neutralizing it • Negative charges attracted to spikes, harmlessly discharge it to the ground	**05**
(d)		**03**
(6)(a)(i)	Wave length is the distance between two successive wave particle sin phase	**01**
(ii)	Wave length is distance covered by the wave per second (unit time)	**01**

(b)	For one wave cycle Distance covered = λ Time take $t = T$ $\therefore v = \frac{distance}{time} = \frac{\lambda}{T}$ $But\ T = \frac{1}{f}$ $v = \frac{\lambda}{1/f} = f\lambda$ $v = f\lambda$	**03**
(c)	Mechanical is produced by vibration of particles of medium Electromagnetic is produced by vibration of magnetic and electric sparks	**02**
(d)(i)	Loud sound is heard	**01**
(ii)	Bright light is obtained	**01**
(e)(i)	Sound is form of energy that is produced by vibrating objects	**01**
(ii)	• It is mechanical • It is longitudinal	**01**
(iii)	 • The apparatus is set up as shown above • The clock ticks • The detector is moved to detects maximum sound intensity • The position is noted and angles i and r are measured and recorded • It is found that $< i = < r$	**05**

<table>
<tr><td>7(a)(i)</td><td>Atomic mass is total number of nucleons</td><td>01</td></tr>
<tr><td>(ii)</td><td>Isotopes are atoms of the same element with same atomic number but different mass number</td><td>01</td></tr>
<tr><td>(b)(i)</td><td>I- Alpha , Beta , Gamma</td><td>01</td></tr>
<tr><td>(ii)</td><td>II- Beta, Gamma</td><td>01</td></tr>
<tr><td>(iii)</td><td><table><tr><td>Beta</td><td>Gamma</td></tr><tr><td>Negatively charged</td><td>Neutral</td></tr><tr><td>Less penetrating</td><td>More penetrating</td></tr><tr><td>More Ionizing</td><td>Less Ionizing</td></tr></table></td><td>03</td></tr>
<tr><td>(e)</td><td>• Gold leaf electroscope is charged
• Radiations are directed to the cap
• If the leaf rises, then radiation are same charge as that on the Gold leaf electroscope
• If the leaf falls, then are opposite charge as that on the Gold Leaf Electroscope
• If no change in leaf, then radiations have no charge</td><td>05</td></tr>
<tr><td>(d)</td><td>Alpha particles are massive. Hence less deviated
Isotopes have similar chemical properties hence react same way</td><td>02
02</td></tr>
<tr><td>(8)(a)</td><td>• The incident ray, the refracted ray and the normal at a point of incidence all lie in the same plane
• Ratio of sine of angle of incidence to sine of angle of refraction is constant for a given pair of media</td><td>02</td></tr>
<tr><td>(b)</td><td>$power = \frac{1}{f(m)}$
$= \frac{1}{0.2}$
$= 5Diopters$</td><td></td></tr>
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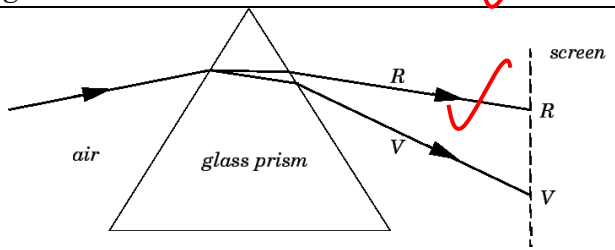
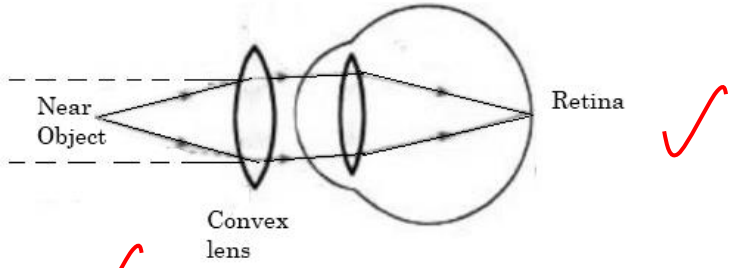
(c)(i)	Dispersion is separation of white light into its constituent colours	**01**
(c)(ii)	 • White light is made of many colours • Colors move at different speeds in glass • Glass has different refractive indices for the different colours • The different colours are deviated to different extents • Red is least and Violet most deviated	**05**
(d)(i)	<table><tr><td>Eye</td><td>Camera</td></tr><tr><td>Biological</td><td>Artificial</td></tr><tr><td>Focal length varies</td><td>Focal length is fixed</td></tr><tr><td>Image distance fixed</td><td>Image distance varies</td></tr></table>	**02**
(ii)	 • Convex lens is put near the eye • Rays from near object are made parallel • The rays are converged at the retina	**04**

END

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