Practice Question Set For GCSE
**Subject : Physics**
**Paper-1 Topic : Motion And Forces**



**Name of the Student**:_____
**Max. Marks : 19 Marks** **Time : 19 Minutes**

Mark Schemes

Q1.

| Question Number | Answer | Mark |
|---|---|---|
| | **A** kg m/s<br><br>***B*** *is not correct it is mass divided by velocity*<br><br>***C*** *is not correct because it is the product of mass and acceleration*<br><br>***D*** *is not correct because it is mass divided by acceleration* | **(1)**<br>**AO1** |

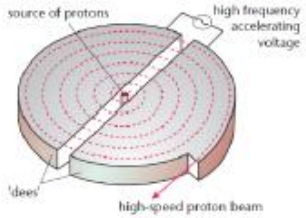
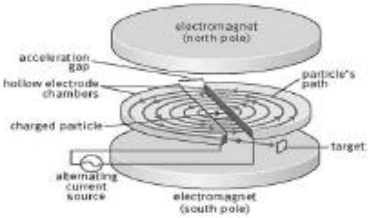
Q2.

| Question Number | Answer | Acceptable answers | Mark |
|---|---|---|---|
| **(a)(i)** | D towards the centre of the circle | | **(1)** |

| Question Number | Answer | Acceptable answers | Mark |
|---|---|---|---|
| **(a)(ii)** | centripetal (force) | reject centrifugal force<br>accept misspellings where meaning is clear e.g. centripedal | **(1)** |

| Question Number | Answer | Acceptable answers | Mark |
|---|---|---|---|
| **(a)(iii)** | Any two of the following :-<br><br>ball slows down (1)<br><br>ball / it drops (down) / circles at a lower height (1)<br><br>go in smaller circles (1) | <br><br>less **kinetic** energy / momentum<br><br>any lowering / less **potential** energy<br><br>stops going in circles<br>the ball/it would not make complete circles<br>(not just 'stops') | **(2)** |

| Question Number | Answer | Acceptable answers | Mark |
|---|---|---|---|
| **(a)(iv)** | An explanation linking:<br><br>• the idea that momentum (of the closed system) would stay the same (1)<br><br>• the idea that kinetic energy would not be conserved (1) | momentum **of the ball** decreases / changes (direction) / passed to wall<br><br>must specify which momentum; do not credit 'momentum decreases' by itself<br><br>kinetic energy → heat/sound/wall<br><br>ignore 'KE decreases / is lost' without qualification<br>allow 'KE is lost because it's not elastic' (i.e. qualified) | **(2)** |

| Question Number | | Indicative Content | Mark |
|---|---|---|---|
| **QWC** | * **(b)** | A description including some of the following points :-<br>Cyclotron<br>• two D-shaped halves<br>• gap between the Dees<br>• (alternating) voltage across the gap<br>• magnetic field (at right angles to the moving particles)<br>• vacuum enables free movement of particles<br><br>Particle movement<br>• accelerate<br>• start at the centre<br>• move in a circular path<br>• spiral outwards<br>• exit in a straight line<br><br>Examples of labelled diagrams which would give Level 3 by themselves<br>(not all labels / details needed)<br>  <br><br>  <br><br><br>Level 2 if no labels but Dees AND particle path shown.<br>Level 1 if no labels but either Dees OR spiral of particle shown<br>Ignore uses of cyclotron | **(6)** |

| Level | 0 | No rewardable content |
|---|---|---|
| 1 | 1 - 2 | • a limited description of either particle movement OR cyclotron e.g. The particles move in a circle OR Cyclotrons have two Dees OR Cyclotrons are particle accelerators OR there's a vacuum<br>• the answer communicates ideas using simple language and uses limited scientific terminology<br>• spelling, punctuation and grammar are used with limited accuracy |
| 2 | 3 - 4 | • a simple description of particle movement AND cyclotron OR a more detailed description of one e.g. A cyclotron has two D-shaped halves and the particles inside accelerate OR A cyclotron has a magnetic field and a voltage across the gap OR Charged particles increase in speed as they spiral outwards OR vacuum allows free movement of particles<br>• the answer communicates ideas showing some evidence of clarity and organisation and uses scientific terminology appropriately<br>• spelling, punctuation and grammar are used with some accuracy |
| 3 | 5 - 6 | • a description of particle movement AND cyclotron with a detailed description of one of them e.g. the charged particles get faster as they accelerate across the gap in the Dees **OR** the magnetic field (of the cyclotron) causes the particles to move in a circle<br>• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately<br>• spelling, punctuation and grammar are used with few errors |

**(Total for Question = 12 marks)**

Q3.

| Question Number | Answer | Mark |
|---|---|---|
| * | Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme.<br><br>The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant.<br><br>**AO1 (6 marks)**<br><br>• momentum = mass × velocity<br>• action and reaction are equal and opposite (N 3)<br>• force of R on Q = -force of Q on R<br>• $\frac{\text{change in momentum of Q}}{\text{time}} = \frac{\text{- change in momentum of R}}{\text{time}}$<br>• time of collision same for both<br>• change in momentum of Q = - change in momentum of R<br>• no overall change in momentum<br>• R accelerates because of force from Q<br>• transfer of momentum between Q and R | **(6)**<br>AO 1 1 |

| Level | Mark | Descriptor |
|---|---|---|
| | 0 | • No rewardable material. |
| Level 1 | 1-2 | • An explanation that demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1)<br><br>Presents an explanation with some structure and coherence. (AO1) |
| Level 2 | 3-4 | • An explanation that demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1)<br><br>• Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1) |
| Level 3 | 5-6 | • An explanation that demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1)<br><br>• Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1) |