

Most of these come from marking our own students' papers, so they are the mistakes made in this classroom, not only the ones examiners report worldwide. The $\times$ line is what was written; the $\checkmark$ line is what would have scored. 下列多数来自本班试卷的批改记录。 $\times$ 是写过的答案, $\checkmark$ 是能得分的写法。

Across every paper

- ✗ Writing the final number with no unit, or with the wrong one.

✓ Every answer carries its unit – N, J, W, m/s^2 – and the unit tells you if the working was right.

Examiners state this directly, and it is the difference between zero and most of the marks when one step slips.

答案必须带单位

ER Jun25 P4
- ✗ Writing only the answer to a calculation.

✓ Formula, then substitution, then answer. Credit is given for correct working even when the number is wrong.

Examiners state this directly, and it is the difference between zero and most of the marks when one step slips.

公式、代入、结果三步都写

ER Jun25 P4
- ✗ Rounding at each step of a multi-step calculation.

✓ Keep the full value until the last line.

Examiners warn that rounding too soon in a question with several steps produces an incorrect final answer.

中途不要四舍五入

ER Jun25 P4
- ✗ Using $g = 10 \text{ N/kg}$ when the front page says 9.8.

✓ Use the value printed on the front of the paper.

Examiners raise this twice in one report – the instruction is on the cover of every paper.

用试卷上给的 g 值

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- ✗ Recalling the answer to a similar question you have seen before.

✓ Read this question, underline the command word and the key words, and answer what it actually asks.

Examiners advise reading the question through very carefully to avoid answering a different one.

看清本题问的是什么

ER Jun25 P4
- Look at the marks and the space given. Examiners state that both indicate the type and length of answer expected.

分值和行数提示答案长度

ER Jun25 P4

1 · Motion, forces and energy 运动、力与能量

- ✗ Using $s = vt$ for an object accelerating from rest.

✓ $s = \frac{1}{2}at^2$, or use the average velocity.

Marked in our own class: $s = vt$ applies only at constant velocity, and a balloon released from rest is not.

加速运动不能用 $s = vt$

class
- ✗ Saying weight decreases as an object falls faster.

✓ Weight is constant near the surface; it is AIR RESISTANCE that increases with speed.

A class answer confused which force changes – this is what terminal velocity depends on.

重力不变, 空气阻力增大

class
- ✗ Calculating impulse from the speeds without signs.

✓ Take one direction as positive: a change from -12 to $+16 \text{ m/s}$ is a change of 28 m/s .

Marked in class. Momentum is a vector, so a rebound doubles the change rather than cancelling it.

动量变化要考虑方向

class
- ✗ Calculating the cost of electricity for one hour when the question said two.

✓ Read the time in the question, and convert W to kW before using the cost per kWh.

A class script did both conversions correctly and then used the wrong time.

看清用电时长

class
- 2 · Thermal physics 热学

✗ Defining specific heat capacity as energy absorbed over time.

✓ The energy needed to raise the temperature of 1 kg of a substance by 1°C .

Marked in class: energy over time is POWER, which is a different quantity entirely.

比热容是每千克每度所需能量

class

✗ Describing solid particles as having ‘fixed motion’.

✓ They VIBRATE about fixed positions in a regular arrangement.

A class answer showed partial understanding; the mark needs both the vibration and the regular arrangement.

固体粒子在固定位置振动

class

✗ Answering ‘what readings does the student take’ by describing what happens to them.

✓ List the readings: temperature, time, mass.

Marked in class – the answer discussed thermal expansion, which was not what was asked.

问读数就列出测量的量

class
- IGCSE Physics · Common Mistakes 常见错误
- ②

3 · Waves 波

✗ Saying ultraviolet is used in optical fibres.

✓ **Infrared – it has low attenuation in glass.**

Marked in class. The reason matters as much as the name: high frequency for data rate, low attenuation for distance.

光纤用红外线

class

✗ Describing an image as diminished when it is magnified.

✓ **Check all three properties: enlarged or diminished, upright or inverted, real or virtual.**

A class script identified the image as enlarged and virtual, then circled ‘diminished’ as well.

像的三个性质都要判断

class

✗ Explaining a converging lens for long sight by saying it ‘helps the eye see’.

✓ **It converges the rays BEFORE they enter the eye, so the image forms on the retina instead of behind it.**

Marked in class: the mark is for where the image forms, not for the lens being helpful.

凸透镜使像落在视网膜上

class

✗ Naming the eye defect by its symptom – ‘cannot see near objects’.

✓ **Name it: hypermetropia, or long sight.**

A class answer described the symptom; examiners want the name of the defect.

要写出缺陷的名称

class

✗ Saying total internal reflection happens when light hits the boundary at any angle.

✓ **The angle of incidence must be GREATER than the critical angle.**

Stated as a mark-scheme requirement – the condition is the mark.

入射角要大于临界角

MS

4 · Electricity and magnetism 电与磁

✗ Saying a thick wire has more resistance because there is more metal.

✓ **Resistance falls as the cross-sectional area rises: $R \propto l/A$.**

Marked in class – short and thick means least resistance, and the relationship is what the question tests.

越粗电阻越小

class

✗ Quoting $R = \rho l/A$ and giving a number with no substitution shown.

✓ **Show how ρ was found from the first wire before using it on the second.**

A class script stated the right formula and lost the marks because the intermediate value never appeared.

中间量也要写出来

class

✗ Using $V_p/I_p = V_s/I_s$ for a transformer.

✓ **For a 100% efficient transformer, $V_p I_p = V_s I_s$ – the POWERS are equal.**

Marked in class: the wrong relationship gives a plausible current and a wrong answer.

变压器功率相等

class

✗ Using iron for a permanent magnet, or steel for an electromagnet core.

✓ **Soft iron loses its magnetism quickly, so it is the electromagnet core; steel keeps it, so it is the permanent magnet.**

Marked in class – the property required is the opposite in each case.

软铁做电磁铁, 钢做永磁体

class

✗ Confusing the split-ring commutator with slip rings.

✓ **A d.c. motor uses a split-ring commutator to reverse the current each half turn; an a.c. generator uses slip rings.**

Marked in class. Both involve coils, brushes and magnets, which is why the parts get swapped.

换向器 vs 滑环

class

✗ Showing a stronger magnetic field by drawing longer field lines.

✓ **Draw the lines CLOSER TOGETHER.**

Marked in class – spacing shows strength, and lines are always closer near the wire.

磁场越强, 磁感线越密

class

5 · Nuclear physics 核物理

✗ Explaining beta decay as the nucleus ‘losing an electron’.

✓ **A neutron becomes a proton and an electron; the proton stays and the electron is emitted.**

Marked in class: the mark is for what happens inside the nucleus, not for what leaves it.

中子变质子并放出电子

class

✗ Explaining charge conservation by describing nucleon number.

✓ **Charge: a neutron is 0, a proton is +1 and a beta particle is –1, so the totals balance.**

A class script described mass-number conservation when the question asked about charge.

电荷守恒要用电荷数说明

class

✗ Halving the total count rate without subtracting the background first.

✓ **Subtract background, halve the source count for each half-life, then add background back.**

Marked in class: 200 – 20 gives 180, which halves to 90, and the reading is 110.

先减本底再算半衰期

class

✗ Reading the top number of a nuclide symbol as the number of protons.

✓ **The top number is the NUCLEON number – protons plus neutrons.**

Marked in class on a chlorine-35 question.

上标是核子数

class

6 · Space physics 空间物理

- ✗

Saying stars shine forever, or that the Solar System has several stars.
- ✓

A star fuses hydrogen into helium and its supply is finite; the Solar System has one star.

Both were marked wrong in class in the same topic.

恒星燃料有限; 太阳系只有一颗恒星

class
- ✗

Answering ‘another way to measure distance’ by restating Hubble’s law.
- ✓

Name a different method – standard candles, such as Cepheid variables.

Marked in class: the answer described the relationship again instead of an alternative.

要写出另一种测距方法

class
- Giving a reason for reclassifying Pluto: it is small and has not cleared its orbit. Examiners expect the property, not just the label ‘dwarf planet’.
- 要说明重新分类的原因

class

The practical paper – Paper 5 and Paper 6

- ✗

Recording readings to different numbers of decimal places from the same instrument.
- ✓

Record every reading to the precision the instrument allows.

Examiners name this ability directly, along with quoting a derived result to an appropriate number of significant figures.

读数精度要一致

ER Jun25 P6
- ✗

Labelling a results-table column with a quantity and no unit.
- ✓

Both, every time: ‘time / s’.

Stated as a mark-scheme requirement: each column must be labelled with both quantity and unit.

表头要有量和单位

MS
- ✗

Choosing a scale that puts the points in one corner, or drawing the best-fit line through the first and last point.
- ✓

Spread the points across the grid, and balance the line between them.

Examiners record difficulty with both scale choice and best-fit lines in the same report.

刻度铺开, 拟合线要平衡

ER Jun25 P6
- Describe apparatus you have actually used. Examiners state that successful candidates showed evidence of having performed a wide range of practical work and could describe the apparatus and its use.
- 要写真正做过的实验

ER Jun25 P6