IB DIPLOMA Topical Past Papers

PHYSICS

SL

PAPER 1

2017 — 2024

1 - (PHYSI/11_SL_Summer_2017_Q1) - *Measurements & Uncertainties*

What is the unit of electrical energy in fundamental SI units?

A. $\mathrm{kg\,m^2C^{-1}s}$

B. $\mathrm{kg\,m\,s^{-2}}$

C. $\mathrm{kg\,m^2s^{-2}}$

D. $\mathrm{kg\,m^2s^{-1}A}$

2 - (PHYSI/11_SL_Summer_2017_Q2) - *Measurements & Uncertainties*

Which of the following is a scalar quantity?

A. Velocity

B. Momentum

C. Kinetic energy

D. Acceleration

3 - (PHYSI/12_SL_Summer_2017_Q1) - *Measurements & Uncertainties*

A stone falls from rest to the bottom of a water well of depth d. The time t taken to fall is $2.0 \pm 0.2\,\mathrm{s}$.
The depth of the well is calculated to be 20 m using $d = \frac{1}{2}at^2$. The uncertainty in a is negligible.

What is the absolute uncertainty in d?

A. $\pm 0.2\,\mathrm{m}$

B. $\pm 1\,\mathrm{m}$

C. $\pm 2\,\mathrm{m}$

D. $\pm 4\,\mathrm{m}$

4 – (PHYSI/12_SL_Summer_2017_Q2) – *Measurements & Uncertainties*

Which is a vector quantity?

A. Pressure

B. Electric current

C. Temperature

D. Magnetic field

5 – (PHYSI/10_SL_Winter_2017_Q1) – *Measurements & Uncertainties*

How many significant figures are there in the number 0.0450?

A. 2

B. 3

C. 4

D. 5

6 – (PHYSI/10_SL_Winter_2017_Q2) – *Measurements & Uncertainties*

An object is positioned in a gravitational field. The measurement of gravitational force acting on the object has an uncertainty of 3 % and the uncertainty in the mass of the object is 9 %. What is the uncertainty in the gravitational field strength of the field?

A. 3 %

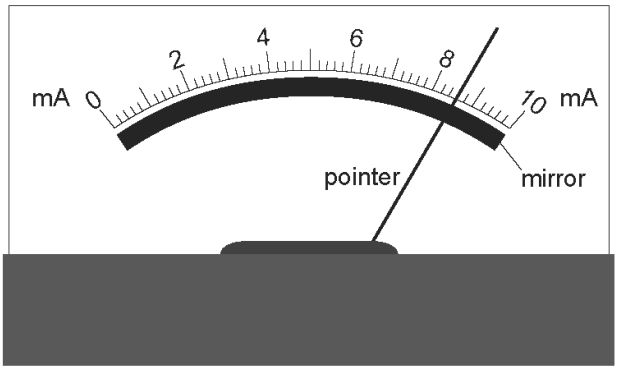
B. 6 %

C. 12 %

D. 27 %

7 - (PHYSI/10_SL_Winter_2017_Q30) - *Measurements & Uncertainties*

The diagram shows an analogue meter with a mirror behind the pointer.



What is the main purpose of the mirror?

A. To provide extra light when reading the scale

B. To reduce the risk of parallax error when reading the scale

C. To enable the pointer to be seen from different angles

D. To magnify the image of the pointer

8 - (PHYSI/11_SL_Summer_2018_Q1) - *Measurements & Uncertainties*

A student measures the radius r of a sphere with an absolute uncertainty Δr. What is the fractional uncertainty in the volume of the sphere?

A. $\left(\frac{\Delta r}{r}\right)^3$

B. $3\frac{\Delta r}{r}$

C. $4\pi\frac{\Delta r}{r}$

D. $4\pi\left(\frac{\Delta r}{r}\right)^3$

9 - (PHYSI/12_SL_Summer_2018_Q1) - *Measurements & Uncertainties*

What is the best estimate for the diameter of a helium nucleus?

A. 10^{-21} m

B. 10^{-18} m

C. 10^{-15} m

D. 10^{-10} m

ANSWERS

1 – (PHYSI/11_SL_Summer_2017_Q1) – *Measurements & Uncertainties*

C

2 – (PHYSI/11_SL_Summer_2017_Q2) – *Measurements & Uncertainties*

C

3 – (PHYSI/12_SL_Summer_2017_Q1) – *Measurements & Uncertainties*

D

4 – (PHYSI/12_SL_Summer_2017_Q2) – *Measurements & Uncertainties*

D

5 – (PHYSI/10_SL_Winter_2017_Q1) – *Measurements & Uncertainties*

B

6 – (PHYSI/10_SL_Winter_2017_Q2) – *Measurements & Uncertainties*

C

7 – (PHYSI/10_SL_Winter_2017_Q30) – *Measurements & Uncertainties*

B

8 – (PHYSI/11_SL_Summer_2018_Q1) – *Measurements & Uncertainties*

B

9 – (PHYSI/12_SL_Summer_2018_Q1) – *Measurements & Uncertainties*

C

10 – (PHYSI/10_SL_Winter_2018_Q1) – *Measurements & Uncertainties*

D