A-Level Physics

Paper 1

Unsolved Topical

Past Papers with Marking Schemes

All Variants

2014-2021

PREFACE

Excellence in learning cannot be claimed without application of concepts in a dexterous way. In this regard one of the logical approach is to start in chunks; like chapter wise learning and applying the concept on exam based questions.

This booklet provides an opportunity to candidates to practice topic wise questions from previous years to the latest. Extensive working of Team MS Books has tried to take this booklet to perfection by collaborating with top of the line teachers.

We have added answer key / marks scheme at the end of each topic for the candidate to compare the hfis/her answer to the best.

MS Books strives to maintain actual spacing between consecutive questions and within options as per CAIE format which gives students a more realistic feel of attempting question.

Review, feedback and contribution in this booklet by various competent teachers of a subject belonging to renowned school chains make it most valuable resource and tool for both teachers and students.
With all belief in strength of this resource material I can confidently claim that it is worth in achieving brilliance.

Our sincere thanks and gratification to Mr. Syed Jabran Ali Kamran who took out special time to help compile and manage this booklet. We would also like to appreciate physics faculty for reviewing and indorsing it.

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CONTENT TABLE

Physical Quantities and Units

Q1/P12/M/J/14,   Q2/P13/O/N/17

1 The maximum theoretical power P of a wind turbine is given by the equation

$$P = k\rho A v^{n}$$

where ρ is the density of air, A is the area swept by the turbine blades, v is the speed of the air and k is a constant with no units.

What is the value of n?

A 1   **B** 2   **C** 3   **D** 4

Q2/P12/M/J/14

2 What is the unit of resistance when expressed in SI base units?

A $kg\,m^{2}\,s^{-2}\,A^{-1}$ **B** $kg\,m^{2}\,s^{-3}\,A^{-2}$ **C** $kg\,m\,s^{-2}\,A^{-1}$ **D** $kg\,m\,s^{-3}\,A^{-1}$
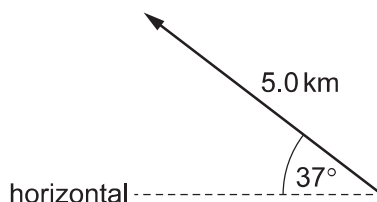
Q2/P13/M/J/14

3 The unit of specific heat capacity is $J\,kg^{-1}\,K^{-1}$.

What is its equivalent in terms of SI base units?

A $kg^{-1}\,m^{2}\,K^{-1}$ **B** $m\,s^{-1}\,K^{-1}$ **C** $m\,s^{-2}\,K^{-1}$ **D** $m^{2}\,s^{-2}\,K^{-1}$

Q3/P13/M/J/14,   Q2/P12/O/N/17

4 What is the vertical component of this displacement vector?

A 3.0 km   **B** 3.8 km   **C** 4.0 km   **D** 5.0 km

Q1/P12/O/N/14

5 A 0.10 kg mass is taken to Mars and then weighed on a spring balance and on a lever balance. The acceleration due to gravity on Mars is 38% of its value on Earth.

What are the readings on the two balances on Mars? (Assume that on Earth $g = 10\,m\,s^{-2}$.)

	spring balance / N	lever balance / kg
A	0.38	0.038
B	0.38	0.10
C	1.0	0.038
D	1.0	0.10

Q2/P12/O/N/14

6 What is equivalent to the unit of electric field strength?

A $J\,C\,m^{-1}$ **B** $N\,s\,A^{-1}$ **C** $kg\,m\,s^{-3}\,A^{-1}$ **D** $kg\,m^{3}\,s^{-3}\,A^{-1}$

Q3/P12/O/N/14

7 The diagram shows the reading on an analogue ammeter.

milliamperes (mA)
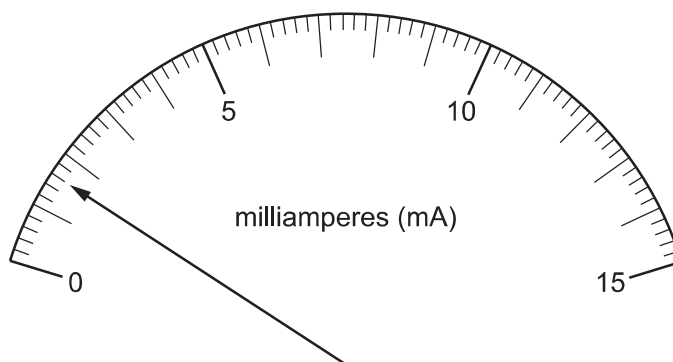
Which digital ammeter reading is the same as the reading on the analogue ammeter?

	display units	display reading
A	μA	1600
B	μA	160
C	mA	16.0
D	A	1.60

Q1/P13/O/N/14

8 When the brakes are applied on a vehicle moving at speed v, the distance d moved by the vehicle in coming to rest is given by the expression

$$d = kv^2$$

where k is a constant.

What is the unit of k expressed in SI base units?

A $m^{-1}s^2$ **B** $m s^{-2}$ **C** $m^2 s^{-2}$ **D** $m^{-1}s$

Q2/P13/O/N/14

9 Which list contains one vector quantity and two scalar quantities?

A displacement, weight, velocity   **C** momentum, mass, speed
B force, acceleration, time   **D** work, density, energy

Q2/P12/M/J/15

10 The average kinetic energy E of a gas molecule is given by the equation

$$E = \tfrac{3}{2} kT$$

where T is the absolute (kelvin) temperature.
What are the SI base units of k?

A $kg^{-1} m^{-1} s^2 K$ **C** $kg\, m s^{-2} K^{-1}$

B $kg^{-1} m^{-2} s^2 K$ **D** $kg\, m^2 s^{-2} K^{-1}$

Q1/P13/M/J/15

11 Which statement includes a correct unit?

A energy = 7.8 N s   **C** momentum = 6.2 N s

B force = 3.8 N s   **D** torque = 4.7 N s

Q2/P13/M/J/15

12 What is the joule (J) in SI base units?

   A $kg\,m\,s^{-1}$ B $kg\,m^2\,s^{-1}$ C $kg\,m\,s^{-2}$ D $kg\,m^2\,s^{-2}$

Q3/P13/M/J/15

13 The speed of an aeroplane in still air is $200\,km\,h^{-1}$. The wind blows from the west at a speed of $85.0\,km\,h^{-1}$.

   In which direction must the pilot steer the aeroplane in order to fly due north?

   A 23.0° east of north   C 25.2° east of north

   B 23.0° west of north   D 25.2° west of north

Q1/P12/O/N/15

14 Which list shows increasing lengths from beginning to end?

   A 1 cm   1 nm   1 mm   1 μm   C 1 nm   1 μm   1 mm   1 cm

   B 1 μm   1 mm   1 nm   1 cm   D 1 mm   1 cm   1 μm   1 nm

Q2/P12/O/N/15

15 Which equation contains only scalar quantities?

   A $acceleration = \dfrac{force}{mass}$ C $pressure = \dfrac{force}{area}$

   B $power = \dfrac{work}{time}$ D $velocity = \dfrac{displacement}{time}$

Q3/P12/O/N/15

16 The time T taken for a satellite to orbit the Earth on a circular path is given by the equation

$$T^2 = \frac{kr^3}{M}$$

   where r is the radius of the orbit, M is the mass of the Earth and k is a constant.
   What are the SI base units of k?

   A $kg^{-1}\,m^{-3}\,s^2$ B $kg^{-1}\,m^3\,s^2$ C $kg\,m^{-3}\,s^2$ D $kg\,m^3\,s^2$

Q1/P13/O/N/15

17 What is the unit of the Young modulus when expressed in SI base units?

   A $kg\,m^{-1}\,s^{-2}$ B $kg\,m^3\,s^{-2}$ C $kg\,m^{-2}$ D $kg\,m^{-1}\,s^{-1}$

Q2/P13/O/N/15

18 The Reynolds number R is a constant used in the study of liquids flowing through pipes. R is a pure number with no unit.

$$R = \frac{\rho v D}{\mu}$$

   where ρ is the density of the liquid, v is the speed of the liquid and D is the diameter of the pipe through which the liquid flows.
   What are the SI base units of μ?

   A $kg\,m\,s$ B $kg\,m^{-1}\,s$ C $kg\,m\,s^{-1}$ D $kg\,m^{-1}\,s^{-1}$

ANSWER KEY

Sr #	Key	Sr #	Key	Sr #	Key
1.	C	31.	D	61.	C
2.	B	32.	A	62.	C
3.	D	33.	B	63.	A
4.	A	34.	A	64.	A
5.	B	35.	D	65.	D
6.	C	36.	C	66.	D
7.	A	37.	D	67.	B
8.	A	38.	C	68.	C
9.	C	39.	C	69.	C
10.	D	40.	A	70.	B
11.	C	41.	A	71.	B
12.	D	42.	C	72.	C
13.	D	43.	B	73.	A
14.	C	44.	B	74.	C
15.	B	45.	D	75.	D
16.	C	46.	D		
17.	A	47.	B		
18.	D	48.	A		
19.	C	49.	B		
20.	C	50.	B		
21.	A	51.	C		
22.	D	52.	C		
23.	B	53.	A		
24.	B	54.	B		
25.	D	55.	C		
26.	D	56.	A		
27.	D	57.	A		
28.	B	58.	D		
29.	A	59.	B		
30.	D	60.	D		