

**Sixth Form Entrance Examination**

**Specimen Paper**

**PHYSICS**

**Time allowed: 60 minutes**

SECTION A

**Use the attached ‘Multiple Choice Answer Sheet’ at the back of this booklet to give your answer to the following multiple questions. You may detach the sheet but remember to write your name and school in the space provided.**

**Indicate your answer by joining the dots under your chosen letter using a dark (HB) pencil. Ensure you have only one clear answer for each question.**

**Q1** A racing car accelerates from 10m/s to 25m/s in 5 seconds. What is its average acceleration?

 **A** 3m/s2

 **B** 7m/s2

 **C** 5m/s2

 **D** 15m/s2

 **E** 2m/s2

Questions 2-4

An Apollo astronaut on the Moon with no atmosphere released a hammer from rest and it fell to the Moon’s surface.

**Q2** The graph of its distance *d* against time *t* during its fall is



**Q3** The graph of its velocity *v* against time *t* is



**Q4** The graph of its acceleration *a* against time *t* is



Questions 5-6

 In this circuit, the reading on the ammeter is 0.5A.



**Q5** The reading on the voltmeter is

 **A** 2V

 **B** 5V

 **C** 8V

 **D** 12V

 **E**  20V

**Q6** If the 10 ohm resistor is replaced with a 15 ohm resistor the reading on the voltmeter is

 **A**  2V

 **B** 7.5V

 **C**  5V

 **D** 10V

 **E** 12V

Questions 7-8

 A plastic rod is rubbed on a dry cloth and the rod becomes positively charged.

**Q7** The rod has

**A** gained electrons

**B**  lost electrons

**C**  gained protons

**D**  lost protons

**E** changed electrons into protons

**Q8** The cloth has

**A**  a positive charge equal to that on the rod

**B**  a negative charge equal to that on the rod

**C**  a positive charge less than that on the rod

**D** a negative charge greater than that on the rod

**E** no charge

**Q9** A pure red lipstick, when viewed in a pure blue light looks

**A** red

**B** blue

**C**  black

**D** white

**E**  magenta

**Q10** An echo sounder on a ship sends waves towards the sea floor. The echo is received after an interval of 3 seconds. If the speed of sound in water is 1500m/s, the depth of the sea floor is

**A** 750m

**B**  4500m

**C**  9000m

**D** 2250m

**E**  500m

Questions 11-12

 In this circuit, the voltmeter reading is 12V.



**Q11** The combined resistance of the 2Ω and4 Ω resistors in series is

 **A** 2 Ω

 **B** 3 Ω

 **C** 4 Ω

 **D** 6 Ω

 **E** 8 Ω

**Q12** The current flowing through these resistors is

 **A** 2A

 **B** 3A

 **C** 4A

 **D** 6A

 **E** 12A

**Q13** Which of the following statements is **NOT** correct?

 **A** 1M Ω (Megaohm) = 1000000 Ω

 **B** 1kV (kilovolt) = 100V

 **C** 1mA (milliamp) = A

 **D** 1μA (microamp) = A

 **E** 1nA (1 nanoamp) = A

**Q14** A block of mass 480 g rests on a desk as shown. What is the density of the block?



 **A** 12 g/cm3

 **B**  2 kg/m3

 **C** 12 kg/m3

 **D** 480 g/cm3

 **E** 2 g/cm3

Questions 15-17

 A boy whose weight is 300 newton takes 5 seconds from rest to run upstairs to a floor which is 4 metres higher.

**Q15** The work he does against gravity, measured in joules, is

 **A** 6000

 **B** 1500

 **C** 1200

 **D** 600

 **E** 240

**Q16** His average power, in watts, is

 **A** 6000

 **B** 1500

 **C** 1200

 **D** 600

 **E** 240

**Q17** Which of the following statements is false?

 **A** his potential energy decreases

 **B** his kinetic energy changes

 **C** he uses chemical energy

 **D** his power depends on his speed

 **E** he does work against his weight

**Q18** Which of these lines shows the path of a ray of light through a glass block?



**Q19** If the speed of sound in air is 330 metres per second, the wavelength in metres of a note of frequency 550 hertz is

 **A** 181500

 **B** 550

 **C** 330

 **D** 5/3

 **E** 3/5

**Q20** The graph below shows the pressure variation of a sound wave as displayed on a cathode ray oscilloscope connected to a microphone.



 The frequency of the wave is

 **A** 50 Hz

 **B** 100 Hz

 **C** 200 Hz

 **D** 5 000 Hz

 **E** 10000 Hz

**THE END**

**SECTION B**

****

**Q1**

****

****

****

(Total: 10)

**Q2**





(vi) Explain what is meant by the principle of conservation of energy

 ………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

 (2)

(Total: 11)

**Q3** A student is asked to investigate the properties of three different cups.

The cups are all of the same size and shape but made from different materials. These cups keep drinks hot for as long as possible.

She has the following apparatus.



(a) Describe how the student would use the apparatus to determine which cup keeps the liquid hottest.

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

 .................................................................................................................................

.................................................................................................................................

 Continue writing on the next page

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

.................................................................................................................................

................................................................................................................................. .................................................................................................................................

 **(8)**

(b) List two things that she should keep constant when comparing cups in this

investigation.

1 ...................................................................................................................................

2 ...................................................................................................................................

**(2)**

(Total: 10)

**Q4**





**(1)**

(Total: 10)

**(1)**

**End of paper**