U6 week7 MCQ

All working must be shown in full on the M.A.T

Name: _____

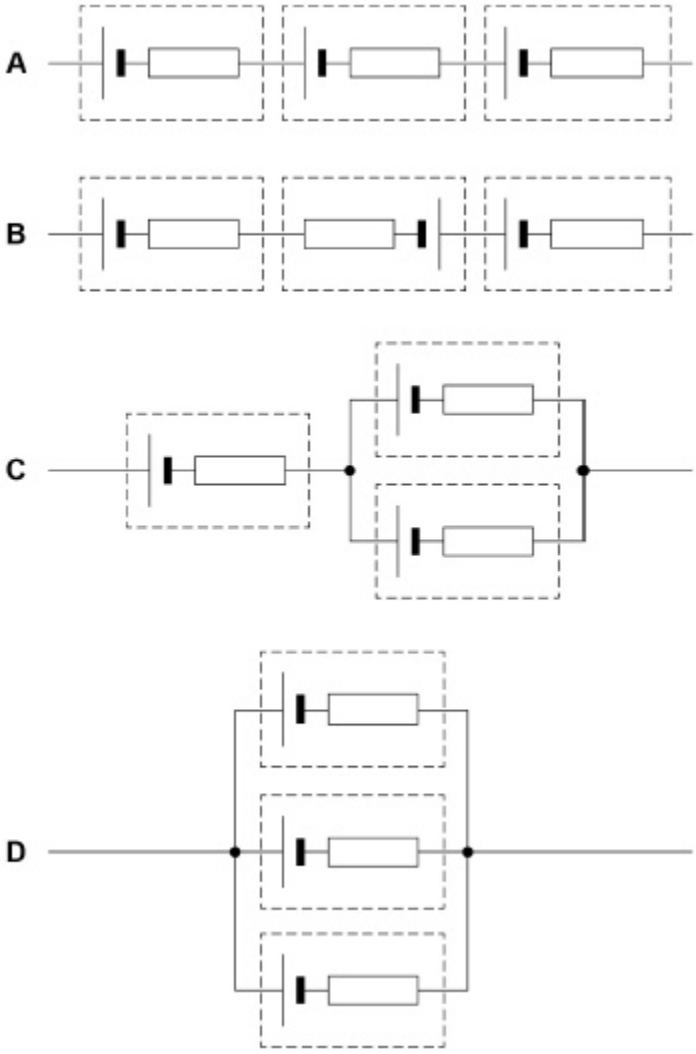
Class: _____

Date: _____

Time:	**15 minutes**
Marks:	**15 marks**
Comments:	**1 mark correct for workings, 1 mark correct answer. Do not write on and submit this paper. USE THE MCQ Answer Template on GoL**

1 Three cells each have an emf ε = 1.5 V and an internal resistance r = 0.6 Ω.

Which combination of these cells will deliver a total emf of 1.5 V and a maximum current of 7.5 A?



A ⬭

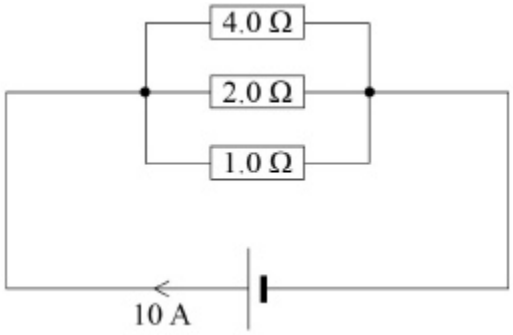
B ⬭

C ⬭

D ⬭

(Total 1 mark)

2 The current in the cell is 10 A as shown.



What is the current in the 2.0 Ω resistor?

A 0.35 A ⬭

B 2.86 A ⬭

C 3.50 A ⬭

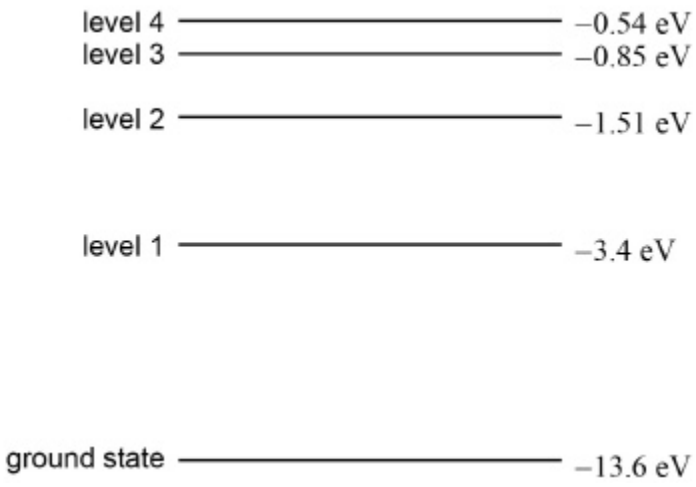
D 7.14 A ⬭

(Total 1 mark)

3 The diagram shows an energy level diagram for a hydrogen atom.

Electrons with energy 13.0 eV collide with atoms of hydrogen in their ground state.

What is the number of different wavelengths of electromagnetic radiation that could be emitted when the atoms de-excite?



A 0 ⬭

B 3 ⬭

C 6 ⬭

D 7 ⬭

(Total 1 mark)

4 The combined resistance of n identical resistors connected in parallel is R_n.

Which statement correctly describes the variation of R_n as n increases?

A R_n decreases linearly as n increases ⬭

B R_n decreases non-linearly as n increases ⬭

C R_n increases linearly as n increases ⬭

D R_n increases non-linearly as n increases ⬭

(Total 1 mark)

5 When light of wavelength 5.0×10^{-7} m is incident normally on a diffraction grating the fourth-order maximum is observed at an angle of 30°.

What is the number of lines per mm on the diffraction grating?

A 2.5×10^{2} ⬭

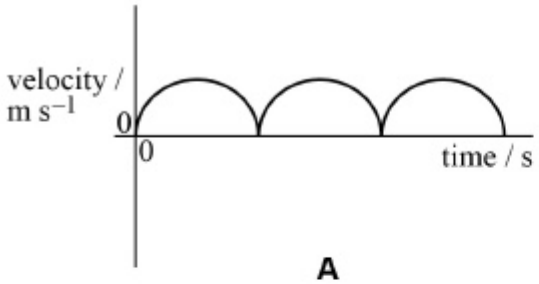
B 2.5×10^{5} ⬭

C 1.0×10^{3} ⬭

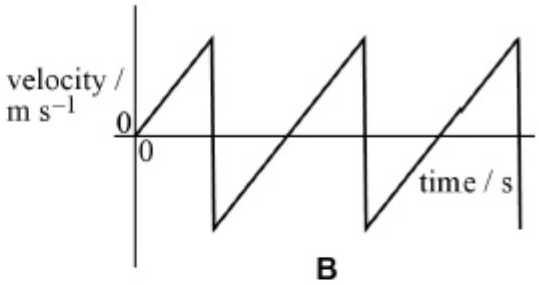
D 1.0×10^{6} ⬭

(Total 1 mark)

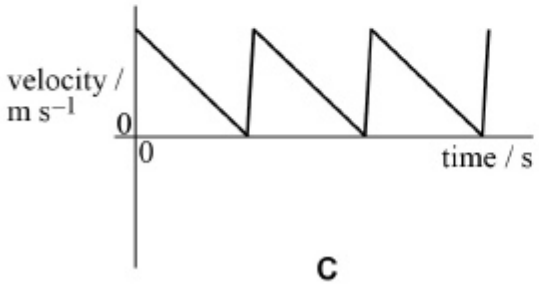
6 Which graph best represents the velocity–time graph for a ball that is dropped from rest and bounces repeatedly?



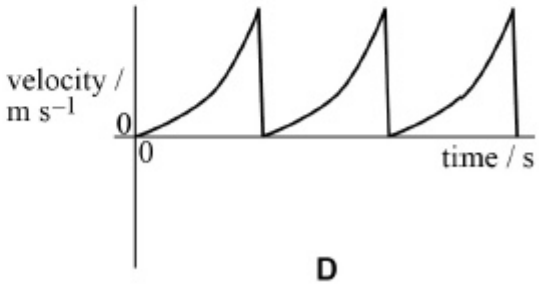
A



B



C



D

A ⬭

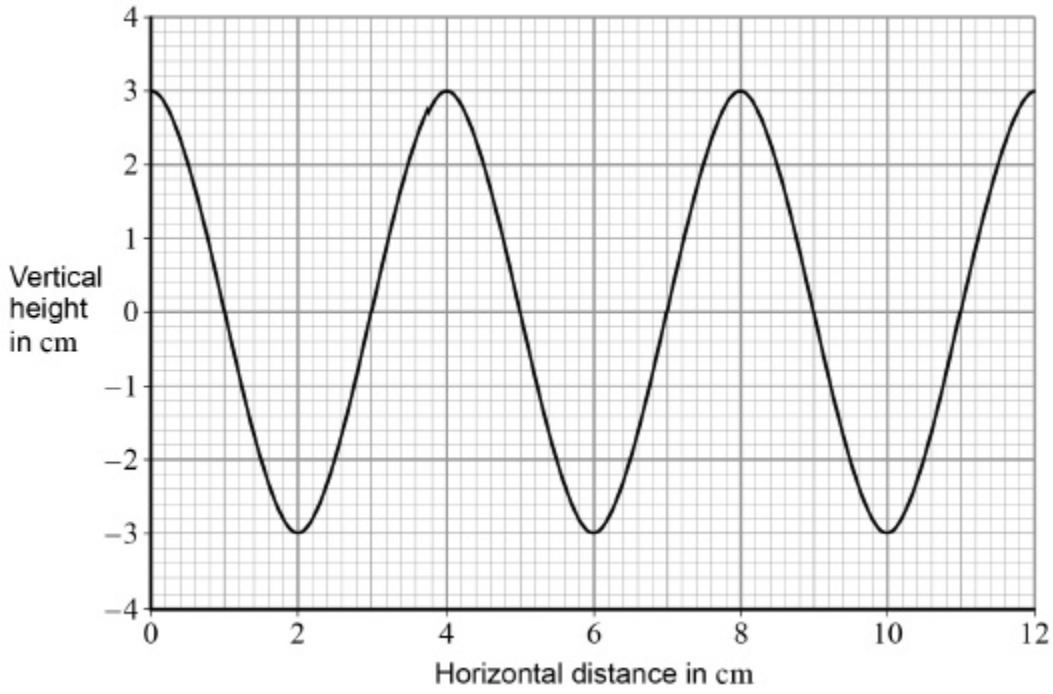
B ⬭

C ⬭

D ⬭

(Total 1 mark)

7 The graph shows how the vertical height of a travelling wave varies with distance along the path of the wave.



The speed of the wave is 20 cm s^{-1}.

What is the period of the wave?

A 0.1 s ⬭

B 0.2 s ⬭

C 5.0 s ⬭

D 10.0 s ⬭

(Total 1 mark)

8 A car of mass 580 kg collides with the rear of a stationary van of mass 1200 kg.

Following the collision, the van moves with a velocity of 6.20 m s^{-1} and the car recoils in the opposite direction with a velocity of 1.60 m s^{-1}.

What is the initial speed of the car?

A 5.43 m s^{-1} ⬭

B 11.2 m s^{-1} ⬭

C 12.8 m s^{-1} ⬭

D 14.4 m s^{-1} ⬭

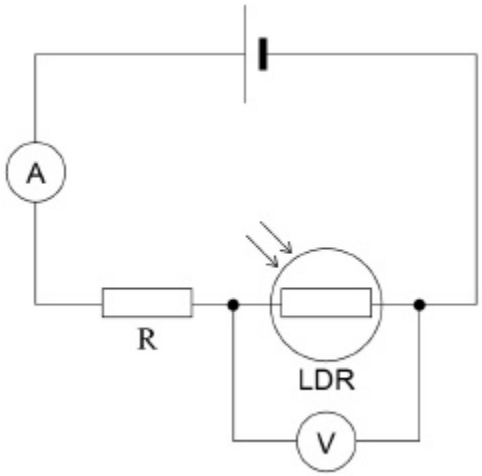
(Total 1 mark)

9 Which row correctly states whether momentum, mass and velocity are scalar or vector quantities?

	Momentum	**Mass**	**Velocity**	
A	scalar	scalar	vector	⬭
B	vector	scalar	scalar	⬭
C	scalar	vector	scalar	⬭
D	vector	scalar	vector	⬭

(Total 1 mark)

10 The figure shows a light dependent resistor (LDR) and fixed resistor R connected in series across a cell. The internal resistance of the cell is negligible.

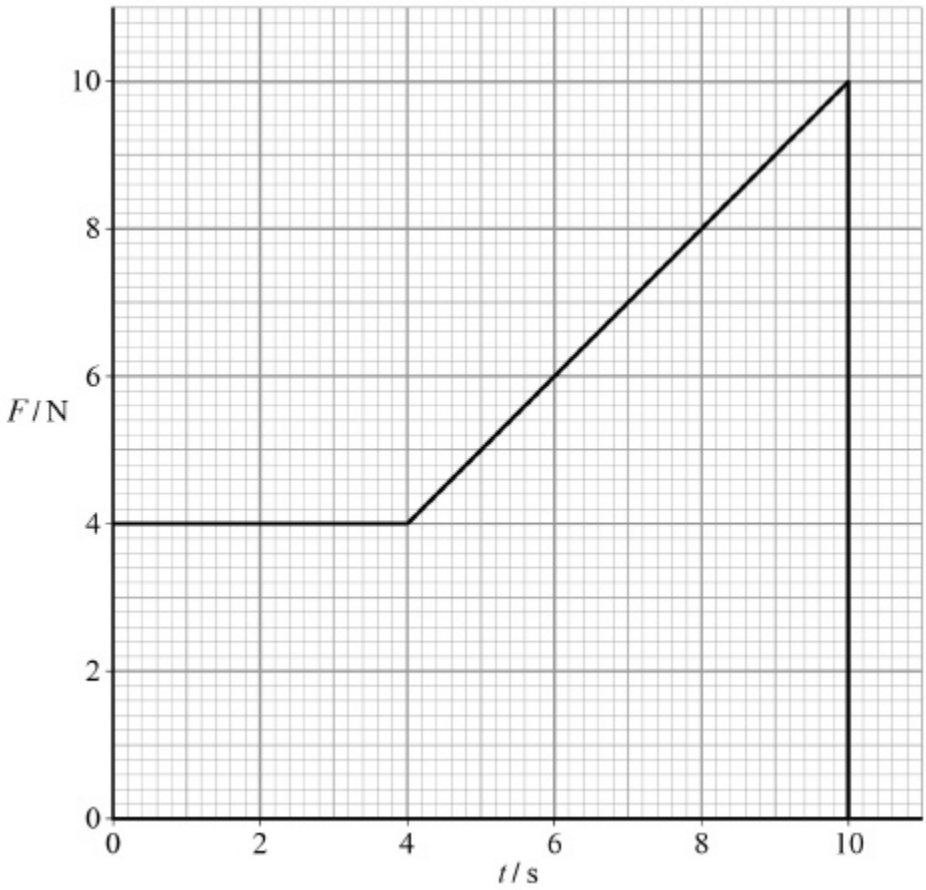


Which row shows how the readings on the ammeter and the voltmeter change when the light intensity incident on the LDR is increased?

	Ammeter reading	**Voltmeter reading**	
A	decreases	increases	⬭
B	decreases	decreases	⬭
C	increases	increases	⬭
D	increases	decreases	⬭

(Total 1 mark)

11 The graph shows how the force F applied to an object varies with time t.



What is the momentum gained by the object from $t = 0$ to $t = 10$ s?

A 18 kg m s^{-1} ⬭

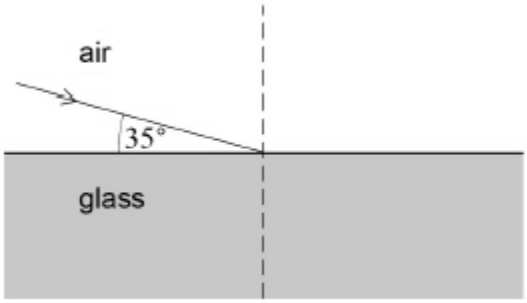
B 32 kg m s^{-1} ⬭

C 40 kg m s^{-1} ⬭

D 58 kg m s^{-1} ⬭

(Total 1 mark)

12 The diagram shows a ray of light travelling in air and incident on a glass block of refractive index 1.5



What is the angle of refraction in the glass?

A 22.5° ⬭

B 23.3° ⬭

C 33.1° ⬭

D 59.4° ⬭

(Total 1 mark)

13 A wire has a resistance R.

What is the resistance when both the length and radius of the wire are doubled?

A $\frac{R}{4}$ ⬭

B $\frac{R}{2}$ ⬭

C $2R$ ⬭

D $4R$ ⬭

(Total 1 mark)

14 Which statement about superconductors is correct?

A When a material becomes a superconductor, its resistivity is almost zero. ⬭

B The temperature at which a material becomes a superconductor is called the critical temperature. ⬭

C When current passes through a superconductor the pd across it becomes a maximum. ⬭

D Copper is a superconductor at room temperature. ⬭

(Total 1 mark)

15 Two bodies of different masses undergo an elastic collision in the absence of any external force.

Which row gives the effect on the total kinetic energy of the masses and the magnitudes of the forces exerted on the masses during the collision?

	Total kinetic energy	**Magnitudes of forces**	
A	remains unchanged	same on both masses	⬭
B	remains unchanged	greater on the smaller mass	⬭
C	decreases	same on both masses	⬭
D	decreases	greater on the smaller mass	⬭

(Total 1 mark)