



AQA GCSE Physics (9-1)

Multiple Choice Questions

'MCQs Mega Bank'

Paper 1

(Foundation Tier)

Introduction

This publication contains 160 multiple choice questions for:

AQA GCSE Physics (9-1) Paper 1 Foundation tier.

The topics covered are:

Topic 1 – Energy

Topic 2 – Electricity

Topic 3 – Particle model of matter

Topic 4 – Atomic structure

All questions in this publication are designed to test the content of the AQA GCSE Physics examination, but ***are not in the same format*** as the questions that will be on the paper. The intention of this publication is to aid in the assessment and revision of the material on the specification, not to familiarise the students with the question format.

Each question in this publication has one answer only – A, B, C or D.

A full set of answers is provided at the very rear of this publication and the topics from which they are taken is colour-coded as follows:

Topic 1 – Energy	
Topic 2 – Electricity	
Topic 3 – Particle model of matter	
Topic 4 – Atomic structure	

Please email any questions or feedback to the Physics team at dme publications ltd via the email address info@dmepublications.co.uk

Multiple Choice Questions

Answer **all** the questions.

AQA GCSE Physics (9-1) Paper 1. Foundation Tier.

1 Which of the following is the energy store of a moving body?

- A Elastic potential energy
- B Gravitational potential energy
- C Kinetic energy
- D Thermal energy

Your answer

2 How much energy is stored as a kinetic store when a car of mass 800kg moves at 10 m/s?

- A 4000 J
- B 8000 J
- C 40,000 J
- D 80,000 J

Your answer

3 How much energy is stored in the gravitational potential energy store when a 500g ball is placed 20m above the ground?

- A 100J
- B 1000 J
- C 5000 J
- D 10,000 J

Your answer

4 Which row below correctly shows the energy stored when a spring of spring constant 50N/m is stretched by 20cm?

A 0.5 J

B 1J

C 100 J

D 1000 J

Your answer ☐

5 What is the correct equation for calculating efficiency?

A Efficiency = useful output energy / total input energy

B Efficiency = input energy / output energy

C Efficiency = useful output / wasted output energy

D Efficiency = input energy / wasted output energy

Your answer ☐

6 Which statement about energy transfer is not correct?

A The energy store in a stretched elastic band can be transferred to a kinetic store

B Energy can be transferred by mechanical, electrical and thermal transfers

C Raising a body above the ground will increase its gravitational potential energy store

D There will be a net change to the energy store of a closed system when transfers occur

Your answer ☐

7 A radio transfers 40J of chemical potential store to 28J of useful energy.

Which row of the table is correct based on this information?

	Efficiency	Energy loss
A	0.3	12J
B	0.7	12J
C	0.3	28J
D	0.8	12J

Your answer ☐

8 Which of the following will not lead to an increase in efficiency?

- A Using lubrication in a mechanical process
- B Using thermal insulation in a thermal process
- C Increasing the proportion of the input energy that is dissipated to the surroundings
- D Reducing energy losses through the use of better equipment

Your answer ☐

9 Which row correctly describes how the rate of cooling through the walls of a house could be lowered?

	Thickness of wall	Thermal conductivity of wall
A	increase	increase
B	decrease	decrease
C	increase	decrease
D	decrease	increase

Your answer ☐

10 A mass of 40kg of water is heated from 10°C to 100°C. How much energy is required to do this? Water has a specific heat capacity of 4200 J/kg°C.

- A 9450 J
- B 378,000 J
- C 15,120,000 J
- D 18,480,000 J

Your answer

11 A microwave oven transfers 450,000J of energy in 10 minutes. What is the power rating of the microwave oven?

- A 750 W
- B 800 W
- C 1200 W
- D 45000 W

Your answer

12 Which of the following is a pair of renewable energy resources?

- A Coal and nuclear fuel
- B Oil and natural gas
- C Oil and hydroelectricity
- D Tidal power and geothermal energy

Your answer

13 Which of the following pairs of energy resources produce most carbon dioxide when being used ?

- A Coal and nuclear fuel
- B Geothermal and tidal power
- C Oil and Coal
- D Nuclear fuel and hydroelectricity

Your answer ☐

14 Which of the following pairs of energy resources are most reliable?

- A Nuclear fuel and Oil
- B Tidal power and solar power
- C Wave and wind power
- D Solar power and hydroelectricity

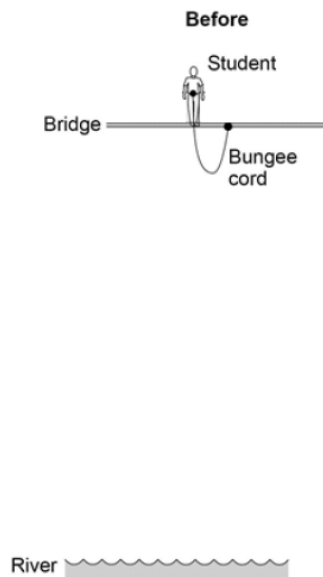
Your answer ☐

15 Which of the following statements concerning energy resources is true?

- A Bio-fuel, coal and nuclear fuel are all examples of non-renewable resources
- B The use of nuclear fuel has decreased in the UK since the 1800s.
- C The demand for energy in the World has remained constant since 1900.
- D Energy resources are used mainly for heating, transport and for generating electricity

Your answer ☐

16 Which of the following statements is true for the bungee jumper?



- A Before he jumps, his gravitational potential energy is at its lowest value
- B When he jumps, the bungee cord will immediately extend to its maximum length
- C His gravitational potential energy store will be transferred to kinetic and elastic potential stores
- D As he falls, the total gravitational potential and kinetic energy stores of the system will decrease

Your answer ☐

17 Which of the following statements best describes the meaning of 'specific heat capacity'?

- A The energy required to convert 1kg of ice to 1kg of water
- B The energy required to raise the mass of 1kg of a body by 1°C
- C The energy required to convert 1g of water to 1g of steam
- D The energy given out when a mass of water freezes to become ice

Your answer ☐

18 A climber of mass 60kg climbs up a wall of height 30m in a time of 90 seconds.

What is the climber's power? Take g to be 10 N/kg.

A 78 W

B 83 W

C 183 W

D 200 W

Your answer ☐

19 Aluminium has a specific heat capacity of 900 J/kg°C and water has a specific heat capacity of 4200 J/kg°C. Based on these figures, which of the following statements is true?

A 1kg of aluminium will take much longer to change its temperature than water

B 1kg of water needs to receive much more energy than 1kg of aluminium to change its temperature by 1°C.

C Aluminium is much more suitable for use in car radiators than water

D Water will turn to steam more easily than aluminium metal will melt.

Your answer ☐

20 What will be the main changes in energy stores when a car accelerates up a hill?

A Chemical store and kinetic store decrease, gravitational potential store increases

B Thermal store decreases, kinetic and chemical store increase

C Chemical, gravitational and kinetic store decrease

D Chemical energy store decreases, kinetic, gravitational and thermal stores increase.

Your answer ☐

21 How much charge passes a point if 3A flows for 30s?

- A 0.3 C
- B 10 C
- C 30 C
- D 90 C

Your Answer

22 Which of the following is not true for static electricity?

- A If electrons are transferred onto a material it will gain a negative charge
- B If electrons leave a material it will have an overall positive charge
- C Materials become positive charged by gaining protons
- D Insulators can be charged by rubbing them with a cloth

Your Answer

23 Which particle is transferred when materials become statically charged?

- A The electron
- B The proton
- C The neutron
- D Electrons and protons

Your Answer

24 Which of the following is true for the current in a series circuit?

- A The current leaving the cell is greater than the current returning to the cell
- B The current gets used up by the components in the circuit
- C The current is the same at every point in the circuit
- D The current is measured with an ammeter placed in parallel with the component

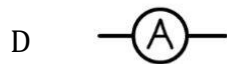
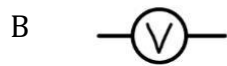
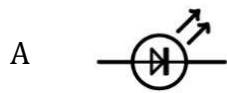
Your Answer

25 How should an ammeter and a voltmeter be arranged next to a component in a circuit?

- A Ammeter in series, voltmeter in series
- B Ammeter in parallel, voltmeter in series
- C Ammeter in series, voltmeter in parallel
- D Ammeter in parallel, voltmeter in parallel

Your Answer ☐

26 Which of the following is the symbol for an LED?



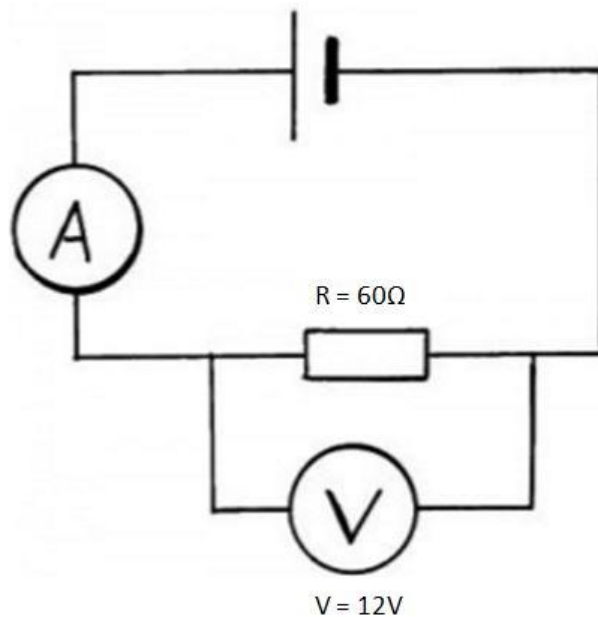
Your Answer ☐

27 What potential difference is needed for a current of 1.5A to flow through a 60Ω resistor?

- A 0.025 V
- B 40 V
- C 61.5 V
- D 90 V

Your Answer ☐

28 What is the size of the current flowing through the resistor?



- A 0.2 A
- B 5.0 A
- C 72 A
- D 720 A

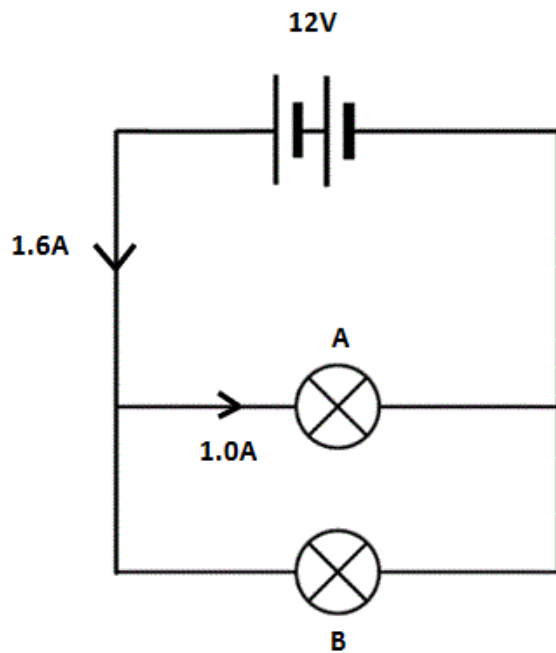
Your Answer

29 Which row correctly states what happens to the net resistance when more and more resistors are arranged in series and parallel?

	Resistors in series	Resistors in parallel
A	Resistance increases	Resistance increases
B	Resistance increases	Resistance decreases
C	Resistance decreases	Resistance increases
D	Resistance decreases	Resistance decreases

Your answer

30 What is the resistance of bulb B in the circuit?



- A $6\ \Omega$
- B $10\ \Omega$
- C $20\ \Omega$
- D $32\ \Omega$

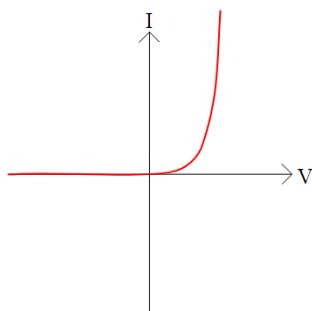
Your Answer

31 An electric motor takes a current of 3A when connected to a potential difference of 240 V a.c. What is the power rating of the motor?

- A 80 W
- B 240 W
- C 720 W
- D 2160 W

Your Answer

32 The IV graph shown below is for which component?



A A filament lamp

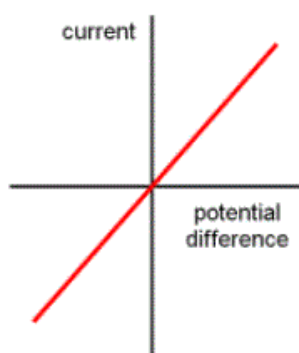
B A resistor

C A diode

D An LDR

Your Answer ☐

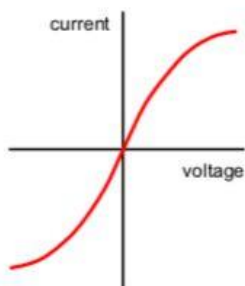
33 Which row in the table below correctly describes the component?



	Component	Ohmic or non-ohmic?
A	filament lamp	ohmic
B	thermistor	non-ohmic
C	diode	non-ohmic
D	resistor	ohmic

Your Answer ☐

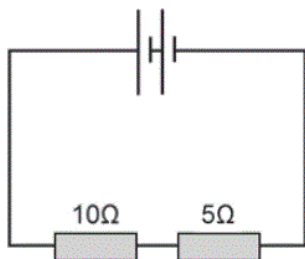
34 Which row in the table below correctly describes the component?



	Component	Ohmic or non-ohmic?
A	filament lamp	Non-ohmic
B	thermistor	ohmic
C	diode	non-ohmic
D	resistor	ohmic

Your Answer

35 If the current leaving the battery in the circuit below is 2A then what is the potential difference of the battery?



A 10 V

B 20 V

C 30V

D 40V

Your Answer

36 Which row below correctly shows the name, colour and potential difference, with respect to the earth wire, in the UK mains supply?

	Wire name	Colour of wire	p.d. with respect to earth wire
A	live	blue	230 V
B	earth	Yellow and green	230 V
C	neutral	brown	0 V
D	live	brown	230 V

Your Answer

37 A current of 4A flows through a 10Ω resistor. How much power is dissipated?

A 2.5 W

B 40 W

C 160 W

D 400 W

Your Answer

38 A charge of 40C passes through a lamp when a potential difference of 20V is across it. How much energy is transferred?

A 2 J

B 20 J

C 80 J

D 800 J

Your Answer

39 How much energy is transferred when a 40 W light bulb is used for 5 minutes?

A 8 J

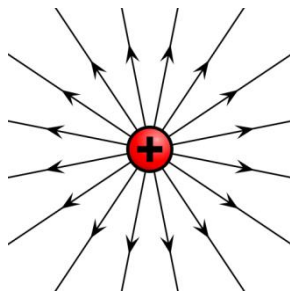
B 200 J

C 2400 J

D 12,000 J

Your Answer

40 The diagram below shows the electric field lines around a positive spherical point charge. Which statement below is correct?



- A The electric field strength gets stronger as the distance from the sphere increases.
- B If an electron was placed in the field, it would be repelled away from the sphere
- C If a proton was placed in the field it would move away from the sphere at a constant speed
- D If a proton was placed in the field it would accelerate away from the sphere

Your Answer ☐

41 Which of the following is true when a 15kg block of ice melts?

- A The ice will melt to form 15kg of liquid water
- B The ice will melt to form more than 15kg of liquid water
- C There will be a change in temperature when the ice melts
- D The amount of energy needed to melt the ice depends on its specific heat capacity

Your answer ☐

42 A block has a mass of 24kg and a volume of 8m³. What is its density?

- A 0.3 m³/kg
- B 3 kg/m³
- C 32 kg/m³
- D 192 kgm³

Your answer ☐

43 Which of the following explains what happens when a fixed volume of gas is heated?

- A The average kinetic energy of the molecules of gas will increase
- B The average speed of the gas molecules will stay the same
- C The pressure of the gas will not change
- D The molecules will all move at the same speed

Your answer ☐

44 Which of the following best describes a solid?

- A A material of low density, no fixed shape and randomly moving molecules
- B A material of low density with a fixed shape and atoms that are far apart
- C A material of high density with no fixed shape and a low melting point
- D A material of high density, a fixed shape with atoms that vibrate about a fixed point

Your answer ☐

45 Which of the following is true when a body melts or freezes?

- A The body will change state from a gas to a liquid
- B There will be a large increase in the temperature of the body as it melts or freezes
- C The change of state will take place without a change in temperature
- D The total mass before the change will be greater than the total mass after the change

Your answer ☐

46 Which of the statements best describe the term 'internal energy'?

A Internal energy is the total kinetic energy of the particles in a body

B Internal energy is the total potential energy of the particles in a body

C Internal energy is the sum of the total kinetic and potential energy of the particles in a body.

D Internal energy is the total chemical potential energy of the particles in a body

Your Answer ☐

47 The density of a liquid is 14 g/cm³. What will be the mass of 250cm³ of the liquid.

A 0.056 g

B 17.9 g

C 350 g

D 3.5 kg

Your Answer ☐

48 The specific latent heat of fusion of water is 334,000 J/kg. How much energy is required to melt 50kg of ice into water at 0°C?

A 0.0001 J

B 6,680 J

C 334,000 J

D 16,700,000 J

Your Answer ☐

49 A gas, kept at constant temperature, has a volume of 40 litres when kept at a pressure of 800,000 Pa. What volume will the gas occupy when the pressure is reduced to 160,000 Pa?

- A 40 litres
- B 120 litres
- C 160 litres
- D 200 litres

Your Answer ☐

50 Which row best describes what happens to the behaviour of particles in a gas when a fixed volume of the gas is heated?

	Speed	Pressure	Kinetic energy
A	increases	decreases	decreases
B	increases	increases	decreases
C	decreases	decreases	increases
D	increases	increases	increases

Your Answer ☐

51 Which of the following statements is true about the nucleus of an atom?

- A The nucleus contains protons and electrons
- B The nucleus of every atom is stable
- C The nucleus has a positive charge
- D The nucleus contains the same number of protons and neutrons

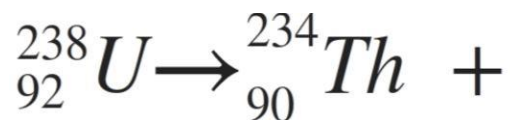
Your answer ☐

52 Which of the following best describes the term 'isotope'?

- A Atoms of an element with the same number of neutrons
- B Atoms of an element with the same number of protons
- C Atoms of an element that are radioactive
- D Atoms of an element that only emit alpha particles

Your answer ☐

53 What is the missing particle in the decay equation shown below?



A An alpha particle

B A beta particle

C A gamma ray

D A neutron

Your answer ☐

54 Which of the following rows in the table best describes the penetrating power of the different types of radiation?

	Alpha	Beta	Gamma
A	high	low	medium
B	low	high	medium
C	low	medium	high
D	medium	high	low

Your answer ☐

55 Which of the following statements is true about half life?

A It is the time taken for the activity to drop to $\frac{1}{4}$ of its original value

B Radioactive elements all have large half lives

C It is the time taken for half of the radioactive particles in a sample to decay

D After two half lives the activity of a source will be zero

Your answer ☐

56 How many neutrons are there in this uranium atom?



- A 92
- B 146
- C 238
- D 330

Your answer ☐

57 Which of the following best describes nuclear fusion?

- A The splitting of an unstable heavy nucleus into smaller nuclei and neutrons
- B The joining together of two smaller nuclei to make a bigger more stable nucleus
- C The formation of a new nucleus due to the emission of an alpha particle
- D The process used to make electricity in nuclear power stations

Your answer ☐

58 Which of the following best describes nuclear fission?

- A The splitting of an unstable heavy nucleus into smaller nuclei and neutrons
- B The joining together of two smaller nuclei to make a bigger more stable nucleus
- C The formation of a new nucleus due to the emission of an alpha particle
- D The process that takes in the Sun to produce light and energy

Your answer ☐

59 Which of the following is not an example of contamination?

- A Being exposed to gamma rays from an external source in a hospital
- B Breathing in radon gas
- C Drinking a liquid that contains a radioactive material
- D Having radioactive material present on the skin

Your answer

☐

60 What is the half-life of a sample whose activity reduces to 25% of its original activity after 8 days?

- A 1 day
- B 2 days
- C 3 days
- D 4 days

Your answer

☐

61 Which of the following is true when 1kg of liquid water boils?

- A The water will boil to form 0.5kg of steam
- B The water will boil to form 1kg of steam
- C There will be a change in temperature when the water boils
- D The amount of energy needed to turn the water to steam depends on the specific heat capacity of water

Your answer

☐

62 A sample of rock has a mass of 6000kg and a volume of 2.5m³. What is its density?

- A 0.004 kg/m³
- B 2400 kg/m³
- C 6000 kg/m³
- D 15000 kg/m³

Your answer

☐

63 Which of the following describes what happens when a fixed volume of gas is cooled?

- A The average speed of the gas molecules will stay the same
- B The average kinetic energy of the molecules of gas will get lower
- C The pressure of the gas will increase
- D The molecules will all move at the same speed

Your answer

☐

64 Which of the following statements best describes a gas?

- A A material of low density, no fixed shape and randomly moving molecules
- B A material of low density with a fixed shape and atoms that are far apart
- C A material of high density with no fixed shape and a low melting point
- D A material of high density, a fixed shape with atoms that vibrate about a fixed point

Your answer

☐

65 The density of a liquid is 2.4 g/cm^3 . What will be the mass of 500cm^3 of the liquid?

A 0.0048 g

B 208 g

C 1200 g

D 2400 g

Your Answer

66 The specific latent heat of fusion of water is $334,000 \text{ J/kg}$. How much energy is released when 20kg of water freezes at 0°C ?

A $16,700 \text{ J}$

B $668,000 \text{ J}$

C $6,680,000 \text{ J}$

D $334,000,000 \text{ J}$

Your Answer

67 A gas, kept at constant temperature, has a volume of 25 litres when kept at a pressure of $200,000 \text{ Pa}$. What volume will the gas occupy when the pressure is increased to $250,000 \text{ Pa}$?

A 20 litres

B 22 litres

C 24 litres

D 30 litres

Your Answer

68 Which row best describes what happens to the behaviour of the molecules in a gas when a fixed volume of the gas is cooled?

	Speed	Pressure	Kinetic energy
A	increases	decreases	decreases
B	increases	increases	decreases
C	decreases	decreases	decreases
D	increases	increases	increases

Your Answer

69 The density of a solid is 9 g/cm³. What will be the volume of 1800g of the solid?

A 0.005 cm³

B 200 cm³

C 16200 cm³

D 32000 cm³

Your Answer

70 The specific latent heat of vaporisation of water is 2,260,000 J/kg. How much energy is required to convert 100g of water to steam?

A 226000 J

B 2,260,000 J

C 22,600,000 J

D 226,000,000 J

Your Answer

71 Which of the following statements is true about the atom?

- A An atom will contain different numbers of protons and electrons
- B The overall charge of any atom is neutral
- C The nucleus of an atom has a negative charge
- D An atom contains protons and electrons in its nucleus

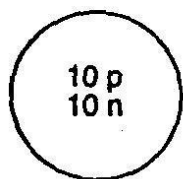
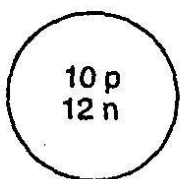
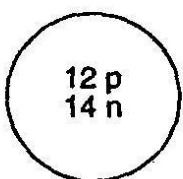
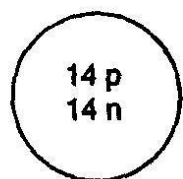
Your answer ☐

72 Which of the following statements best describes the term 'isotope'?

- A Atoms of an element with the same number of neutrons but a varying number of protons
- B Atoms of an element with the same number of protons but a varying number of electrons
- C Atoms of an element with the same number of protons but a varying number of neutrons
- D Atoms of an element that are unstable and radioactive

Your answer ☐

73 Which two of the following atoms are isotopes of the same element?

Q	R	S	T	
				key p = proton n = neutron

- A Atom Q and atom R
- B Atom S and atom T
- C Atom R and atom S
- D Atom Q and atom T

Your answer ☐

74 Any atom must contain the same number of which particles?

A electrons and neutrons.

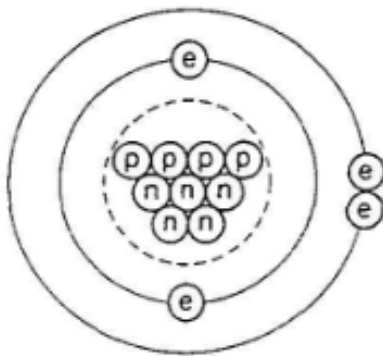
B electrons and protons.

C neutrons and protons.

D electrons, neutrons and protons.

Your answer ☐

75 What is the proton number (atomic number) of this atom?



A 2

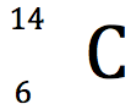
B 4

C 9

D 13

Your answer ☐

76 How many neutrons are there in this carbon atom?



- A 6
- B 8
- C 12
- D 14

Your answer

77 Which statement is true about the three atoms shown?



- A The three atoms contain the same number of neutrons
- B The three atoms all have the same atomic mass
- C The three atoms contain the same number of protons
- D The three atoms are isotopes of oxygen

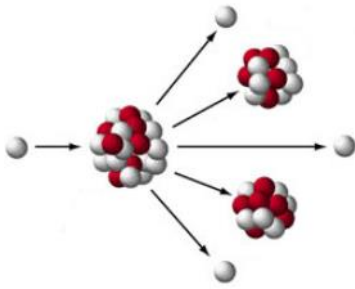
Your answer

78 Which of the following best describes the process of nuclear fission?

- A The splitting of an unstable heavy nucleus into smaller nuclei by a beta particle
- B The splitting of small nuclei by fast-moving protons
- C The splitting of an unstable nucleus into smaller nuclei by slow-moving neutrons
- D The joining together of two smaller nuclei to make a bigger more stable nucleus

Your answer

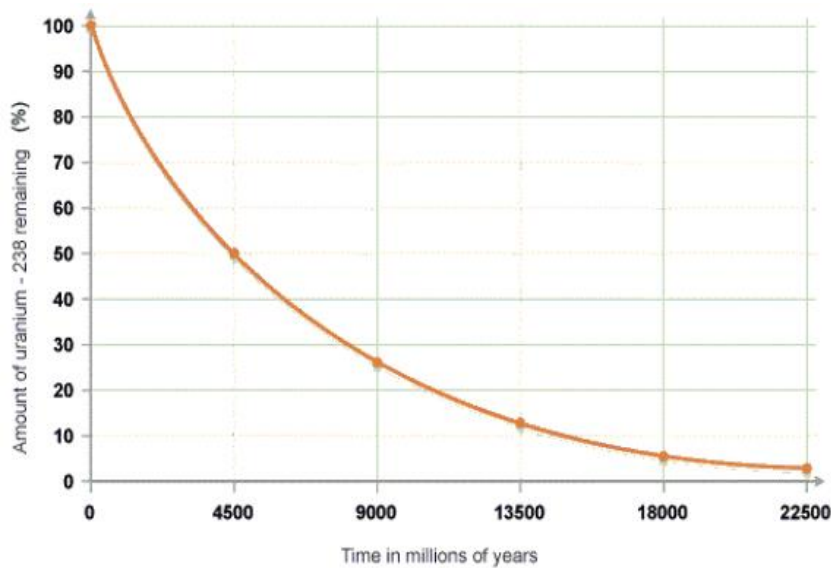
79 Which process is being shown below?



- A Alpha decay
- B Beta decay
- C Nuclear fusion
- D Nuclear fission

Your answer

80 What is the half life of the source based on the graph shown below?



- A 100 years
- B 4500 years
- C 4500 million years
- D 22500 million years

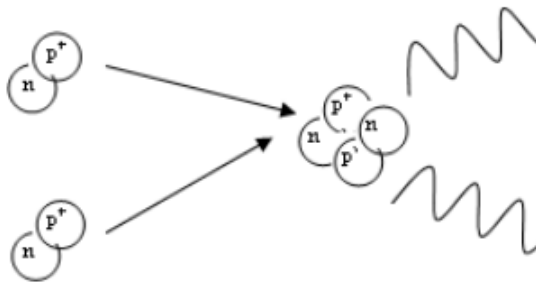
Your answer

81 What is the half-life of a sample of radioactive material whose activity reduces to $\frac{1}{4}$ of its original activity after 4 days?

- A 1 day
- B 2 days
- C 3 days
- D 4 days

Your answer ☐

82 Which process is being shown below?



- A Alpha decay
- B Beta decay
- C Nuclear fusion
- D Nuclear fission

Your answer ☐

83 Which of the following is an example of irradiation from an external source?

- A Being exposed to X rays in a hospital
- B Breathing in radon gas
- C Drinking a liquid that contains a radioactive material
- D Having radioactive material present on the skin

Your answer ☐

84 How much energy is stored as a kinetic store when a toy rocket of mass 3kg moves at 20 m/s?

- A 30 J
- B 60 J
- C 600 J
- D 1200 J

Your answer ☐

85 Which of the following is the energy store of a book that has been placed high up on a bookshelf?

- A Elastic potential energy
- B Gravitational potential energy
- C Kinetic energy
- D Thermal energy

Your answer ☐

86 A torch transfers 250J of chemical potential store to 120J of useful energy. Which row of the table is correct based on this information?

	Efficiency	Energy loss
A	0.48	130 J
B	0.64	130 J
C	0.48	120 J
D	0.36	120 J

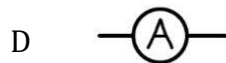
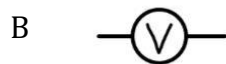
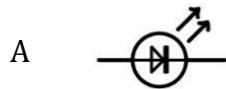
Your answer ☐

87 Which row correctly describes how the rate of cooling through the walls of a house could be increased?

	Thickness of wall	Thermal conductivity of wall
A	increase	increase
B	decrease	decrease
C	increase	decrease
D	decrease	increase

Your answer

88 Which of the following is the symbol for an LDR?



Your Answer

89 What potential difference is needed across a 150Ω resistor to allow a current of 2A to flow through it?

A 0.013 V

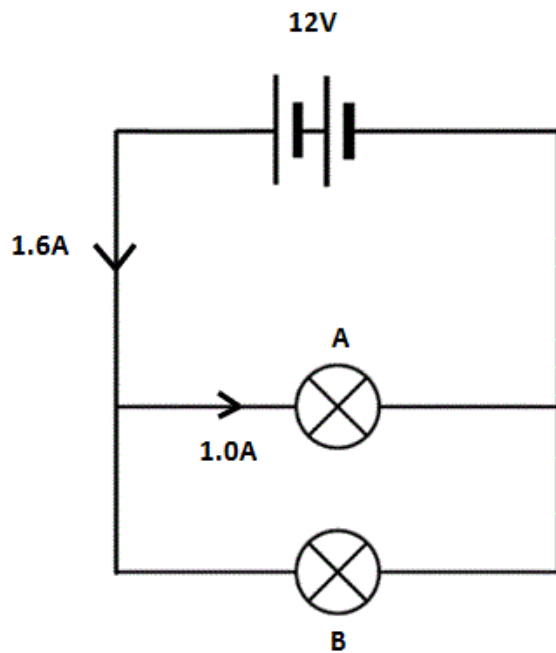
B 75 V

C 300 V

D 600 V

Your Answer

90 What is the resistance of bulb A in the circuit?



- A $6\ \Omega$
- B $12\ \Omega$
- C $20\ \Omega$
- D $32\ \Omega$

Your Answer

91 An electric motor takes a current of 2A when connected to a potential difference of 12 V. What is the power rating of the motor?

- A 0.17 W
- B 6 W
- C 24 W
- D 48 W

Your Answer

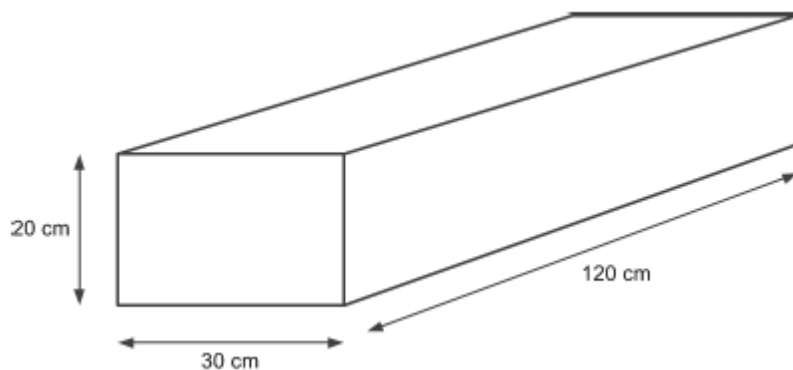
92 When the balloon is rubbed it becomes negatively charged. Which statement correctly describes what has happened.



- A The balloon has lost electrons, which have been rubbed onto the scarf
- B The balloon has gained electrons which have rubbed onto it from the scarf
- C The balloon has lost protons to the scarf
- D The balloon has gained protons from the scarf

Your Answer ☐

93 The rectangular block shown has a density of 2.4 g/cm^3 . What is its mass in kg?



- A 72.5 kg
- B 132.4 kg
- C 172.8 kg
- D 243.8 kg

Your answer ☐

94 Solid carbon dioxide will change from a solid straight into a gas when left on a table. Which of the following is the correct name for this change?

- A Evaporation
- B Condensation
- C Freezing
- D Sublimation

Your answer ☐

95 A gas is contained in a syringe at a constant temperature. The plunger of the syringe is then pulled so that the gas occupies a greater volume without any change in temperature. Which of the following statements about the gas is true?

- A The pressure of the gas will not change when the volume increases
- B The pressure of the gas will decrease when the volume of the gas increases
- C The pressure of the gas will increase as the volume of the gas increases
- D The kinetic energy of the molecules of the gas will remain the same

Your Answer ☐

96 Which of the following are required to calculate the energy needed to change an amount of water from a liquid to a gas?

- A The mass of water and the specific latent heat of vaporisation of water
- B The mass of the water and the specific heat capacity of water
- C The specific latent heat of fusion of water
- D The specific heat capacity of water

Your Answer ☐

97 Which of the following is true when 1kg of liquid water freezes?

A The water will freeze to form 1kg of ice

B The water will freeze to form more than 1kg of ice

C The water will freeze to form less than 1kg of ice

D The amount of energy needed to turn the water to ice depends only on the specific heat capacity of water

Your answer ☐

98 What is the half-life of a sample whose activity reduces to 25% of its original activity after 20 minutes?

A 4 minutes

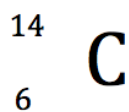
B 5 minutes

C 10 minutes

D 20 minutes

Your answer ☐

99 How many electrons are there in this atom of carbon?



A 6

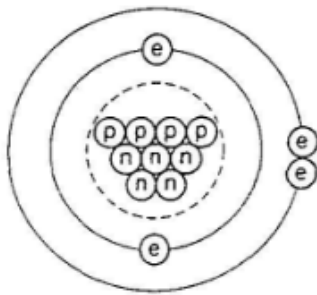
B 8

C 12

D 14

Your answer ☐

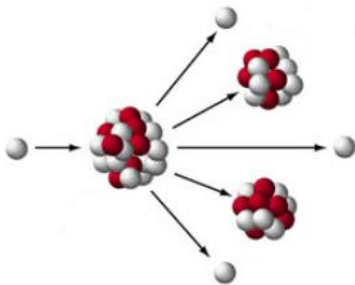
100 What is the mass number of the atom shown below?



- A 4
- B 7
- C 9
- D 13

Your answer

101 Which statement best describes the process that is being shown below?



- A Alpha particles are striking a uranium nucleus and electrons are being released
- B A slow moving neutron hits a large nucleus causing fission to occur
- C A beta particle is striking a plutonium nucleus, causing neutrons to be emitted
- D A gamma ray is interacting with a human cell causing cancer cells to develop

Your answer

102 Which statement regarding nuclear fission is correct?

- A Spontaneous fission is very common in nature
- B When fission occurs, three nuclei and two neutrons are produced
- C All of the products of nuclear fission have kinetic energy
- D The reaction in a nuclear reactor in a power station is uncontrolled fission.

Your answer ☐

103 A ball is thrown upwards into the air until it reaches its maximum height. Which row below shows the changes in energy stores for this example from the instant that the ball leaves the thrower's hand?

- A Kinetic energy decreases, gravitational potential energy increases
- B Kinetic energy increases, gravitational potential energy increases
- C Kinetic energy decreases, thermal energy decreases
- D Gravitational energy increases, thermal energy decreases

Your answer ☐

104 Which row correctly shows the transfer and change in energy store when water is boiled in a kettle.

	Energy transfer	Change in energy store
A	electrical	increase in chemical potential
B	electrical	increase in thermal store
C	thermal	decrease in kinetic store
D	mechanical (forces)	increase in nuclear store

Your answer ☐

105 Which row below shows the changes to energy stores when a moving car is brought to a stop on a flat road.

- A Kinetic energy store transferred to thermal store when brakes are applied
- B Kinetic energy store transferred to gravitational potential energy store
- C Gravitational potential store transferred to thermal store
- D Thermal store transferred to kinetic energy store

Your answer ☐

106 Which row below shows the correct changes in energy stores when a petrol-powered car accelerates up a hill

	Kinetic store	Gravitational store	Chemical store
A	increases	increases	increases
B	decreases	decreases	decreases
C	increases	decreases	increases
D	increases	increases	decreases

Your answer ☐

107 Which of the following statements about energy and power is correct?

- A An energy transfer of 1 joule per second is equal to a power of 1 watt
- B A joule is 1 watt per second
- C Energy is measured in watts, W.
- D $\text{Power (W)} = \text{energy (J)} \times \text{time (s)}$

Your answer ☐

108 Motor A has a power of 60W and motor B has a power of 100W. Which of the following statements about these motors is correct?

- A Both motors will lift a 1kg mass through a height of 1m in the same amount of time
- B Motor A will lift a 1kg mass higher than motor B in the same amount of time
- C Motor A and motor B both do the same amount of work per second
- D Motor B will lift a 1kg mass through a greater height than motor A each second

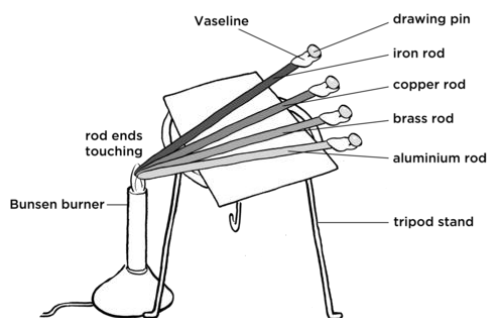
Your answer ☐

109 Which statement below about energy transfers is true?

- A Energy can be transferred, created or destroyed
- B The energy in a closed system is greater after a transfer than it was before the transfer
- C Energy transfers usually occur so that no energy is wasted to the surroundings
- D Energy can be usefully transferred and wasted but cannot be created or destroyed

Your answer ☐

110 A student investigates the thermal conductivities of four different rods as shown.



Which statement below is true for the investigation?

- A All four of the drawing pins will fall off at the same time
- B The drawing pin will fall off the rod with the highest thermal conductivity first
- C The drawing pin will fall off the rod with the lowest thermal conductivity first
- D The rods should all be different thickness and lengths to make it a fair test

Your answer ☐

111 A lawnmower transfers 140W of every 250W of its input power to useful energy. Which of the following rows is correct for this example?

- A The efficiency of the lawnmower is 44% and 140W is wasted
- B The efficiency of the lawnmower is 56% and 110W is wasted
- C The efficiency of the lawnmower is 56% and 140W is wasted
- D The efficiency of the lawnmower is 178% and 110 W is wasted

Your answer ☐

112 Which of the following statements about the reliability of different energy resources is true?

- A Wave power is the most reliable of all the energy resources
- B Tidal power is non-renewable and very reliable
- C Wind and solar power are highly reliable renewable resources
- D Coal and nuclear fuel are non-renewable and reliable sources of energy

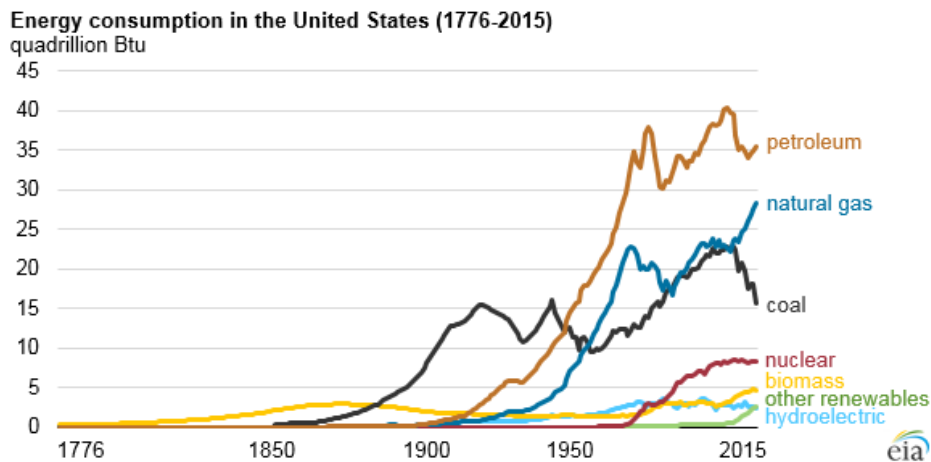
Your answer ☐

113 Which of the statements below is correct about the environmental impact of energy resources?

- A Coal, oil and natural gas all give out large amounts carbon dioxide when burned
- B Nuclear fuel is a major contributor towards global warming.
- C Hydroelectric dams and wind farms do not affect the habitats of plants and animals
- D Wind farms are not considered to be a cause of visual pollution

Your answer ☐

114 Use the graph to decide which statement about the use of energy resources in the USA since 1776 is correct.



- A The USA uses mostly renewable energy resources
- B The increase in the amount of petroleum used is not related to the growth in population since 1776
- C The amount of natural gas used has remained constant since 1900
- D Natural gas and oil are more commonly used compared with nuclear fuel

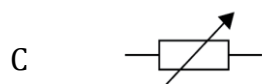
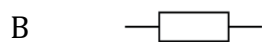
Your answer ☐

115 Which of the following statements about science and the environment is correct?

- A The impact of pollution on the environment is not related to population growth
- B Science has the ability to identify environmental issues arising from different energy resources
- C Science has the power to deal effectively with political and social issues
- D Science has the power to deal effectively with ethical and economic considerations

Your answer ☐

116 Which of the following circuit components has a resistance value that stays constant under different conditions of use?



Your answer

117 Which statement below correctly shows the relationship between current, resistance and potential difference?

A Increasing resistance causes an increase in current at a constant potential difference

B Increasing potential difference causes a decrease in current at a constant resistance

C Increasing potential difference makes no difference to the current flowing through a resistor

D Increasing resistance causes a decrease in current at a constant potential difference

Your answer

118 Which of the following statements correctly explains the behaviour of an LDR in a circuit?

A When light intensity increases, the resistance of the LDR increases

B When temperature increases, the resistance of the LDR increases

C When temperature increases, the resistance of the LDR decreases

D When light intensity increases, the resistance of the LDR decreases

Your answer

119 Which of the following statements correctly explains the behaviour of a thermistor in a circuit?

- A When light intensity increases, the resistance of the thermistor increases
- B When temperature increases, the resistance of the thermistor increases
- C When temperature increases, the resistance of the thermistor decreases
- D When light intensity increases, the resistance of the thermistor decreases

Your answer ☐

120 Which of the following best describes the use of an LDR in a circuit?

- A It can be used to switch on a circuit when it gets warm
- B It can be used to switch on a circuit when light levels change
- C It can be used to only let current pass one way through a resistor
- D It is used to detect if someone has entered a room due to a change in pressure

Your answer ☐

121 Which of the following is correct for series circuits?

- A The current changes in a series circuit when it flows through a resistor
- B The potential difference across all components is equal to the cell voltage
- C The potential difference of the power supply is shared between components in series
- D The net resistance decreases as more resistors are added in series

Your answer ☐

122 Which of the following is correct for parallel circuits?

- A The current is the same at any point in a parallel circuit
- B The potential difference across components add up to give the cell voltage
- C The potential difference of the power supply is shared between components in parallel
- D The net resistance decreases as more resistors are added in parallel

Your answer ☐

123 Which of the following statements is true for direct current in a circuit?

- A It is constantly changing direction
- B It always flows in the same direction, + to -, from the cell
- C It has a frequency of 50 Hz and a potential difference of 230 V
- D It is transmitted to our homes via the National Grid

Your answer ☐

124 Which of the following is not true for mains electricity?

- A It changes its direction 100 times per second
- B It is transmitted to our homes via the National Grid
- C It has a frequency of 50 Hz and a potential difference of 230 V
- D The live wire is not dangerous when the switch in the main circuit is open

Your answer ☐

125 Which of the following statements about the power rating of a device is not true ?

- A Its power rating can be found from the equations $P = I V$ or $P = I^2 R$
- B Its power is related to the energy transferred over a given time
- C Its power is measured in watts, W or joules per second, J/s
- D Its power is not related to the potential difference across it

Your answer ☐

126 The National Grid is made up of which of the following?

- A Cables, transformers and power stations
- B Cables only
- C Cables and transformers
- D Transformers and power stations

Your answer ☐

127 Which statement is true for step-up transformers?

- A They increase the potential difference from the power station to the cables on the grid
- B They increase the current from the power station to the cables on the grid
- C They increase the current from the grid to homes for domestic use
- D They decrease the current from the grid to homes for domestic use

Your answer ☐

128 Which statement is true for step-down transformers?

- A They increase the potential difference from the power station to the cables on the grid
- B They increase the current from the power station to the cables on the grid
- C They increase the current from the grid to homes for domestic use
- D They decrease the potential difference from the grid to homes for domestic use

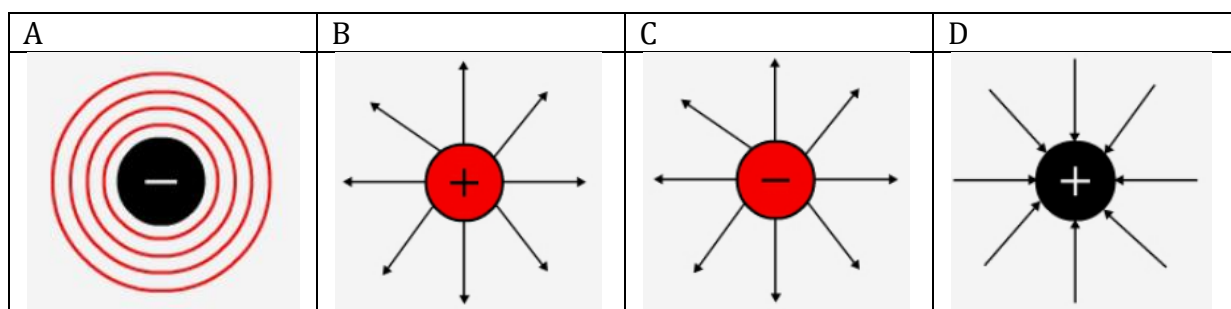
Your answer ☐

129 Which statement about charged objects is true?

- A They always repel each other
- B They always attract each other
- C They can repel or attract each other
- D They can neither attract nor repel each other

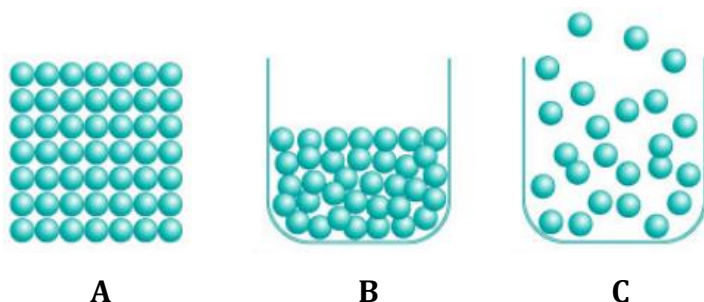
Your answer ☐

130 Which diagram below correctly shows the electric field around an isolated positively-charged sphere?



Your answer

131 Which row correctly shows the states of matter in the diagram below?



	A	B	C
A	solid	liquid	gas
B	solid	gas	liquid
C	liquid	solid	gas
D	gas	liquid	solid

Your answer

132 Which of the following statements is correct regarding density and different states of matter?

A Solids are the most dense, then gases, then liquids

B Gases are the least dense as they have the lowest mass per unit volume

C Liquids are the most dense as the particles in them are closest together

D Gases and liquids tend to have similar density values

Your answer

133 Which of the following statements about changes of state is correct?

- A A change of state occurs along with an increase in temperature
- B A change of state occurs along with a decrease in temperature
- C A change of state occurs with an increase in mass
- D A change of state occurs with no increase in the kinetic energy of the particles

Your answer ☐

134 Which of the following statements about changes of state is correct?

- A Changes of state are chemical changes which are difficult to reverse
- B Changes of state are physical changes which can be easily reversed
- C When evaporation occurs, a body changes from a solid to a liquid
- D When freezing occurs a body can change straight from a gas to a solid

Your answer ☐

135 How does heating a body change the energy stored within it?

- A Heating a body always leads to an increase in the temperature of the body
- B Heating a body always leads to a change in state of a body
- C Heating a body may cause a change in temperature or state of matter
- D Heating a body causes the internal energy of the body to be lowered

Your answer ☐

136 Which row best describes the meaning of the term 'specific latent heat of fusion'?

- A Energy required to change the state of 1kg of a material from a solid to a liquid
- B Energy required to cause a temperature increase of 1kg of any material
- C Energy required to cause 1kg of water to turn to 1kg of steam
- D Energy lost when 1kg of ice is heated to become steam

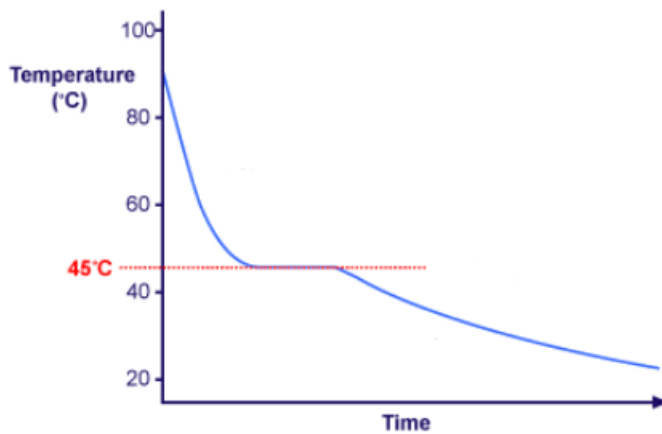
Your answer ☐

137 Which row below correctly states what happens when 1kg of ice changes state from a solid to a liquid at 0°C?

- A There is a change in density and a change in temperature
- B There is a change in temperature but no change in density
- C There is neither a change in density or temperature
- D There is a change in density but no change in temperature

Your answer ☐

138 A liquid is allowed to cool from 90°C as shown. Which statement about the cooling graph below is correct?



- A The melting point of the material is 45°C
- B The boiling point of the material is 45°C
- C Above 45°C, the material shown on the graph will be a gas
- D Below 45°C the material shown on the graph will be a liquid.

Your answer ☐

139 Which of the following is true for the term 'specific heat capacity'?

- A The energy required to change the temperature of 1kg of a mass by 1°C
- B The energy needed to convert 1kg of ice to 1 kg of water
- C The energy required to convert 1kg of ice to 1kg of steam
- D The energy released when 1kg of water freezes to become 1kg of ice

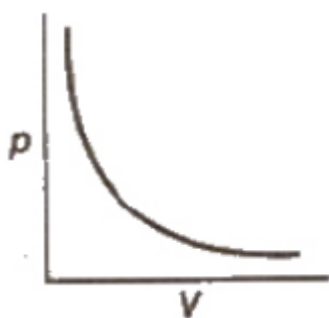
Your answer ☐

140 Which statement is true for the motion of particles in a gas?

- A The kinetic energy of all the particles is the same at a given temperature
- B The speeds of all the particles are the same at a given temperature
- C The motion of the particles is random with a range of kinetic energies
- D The particles all move in the same direction at the same velocity

Your answer ☐

141 The graph shows the relationship between the pressure and volume of a gas kept at constant temperature.



Which statement is true?

- A An increase in pressure leads to an increase in volume for the gas
- B An increase in volume leads to an increase in pressure for the gas
- C An increase in pressure does not affect the volume of the gas
- D A decrease in pressure leads to an increase in volume of the gas

Your answer ☐

142 Which of the following is the correct value for the radius of the atom?

- A $1 \times 10^{-15} \text{ m}$
- B $1 \times 10^{-10} \text{ m}$
- C $1 \times 10^{-8} \text{ m}$
- D $1 \times 10^{-3} \text{ m}$

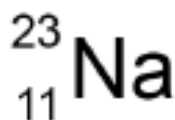
Your answer ☐

143 Which of the following statements about the atom is not correct?

- A The atom has a positively charge nucleus around which electrons orbit
- B Most of the mass of the atom is in the nucleus
- C The radius of the nucleus is about 1/10000 that of the radius of the atom
- D Electrons in orbit around the nucleus all have the same energies

Your answer ☐

144 Which row shows the correct values for the particles found in the sodium atom below



	protons	electrons	neutrons
A	11	11	12
B	12	12	11
C	12	23	11
D	11	12	12

Your answer ☐

145 Which of the following statements about the atom is true?

- A Atoms of the same element always contain the same number of neutrons
- B Atoms that lose an outer electron become a positive ion
- C Atoms that gain an outer electron become a positive ion
- D The mass number of an atom states the number of protons in its nucleus

Your answer ☐

146 Which of the following relates to the work of James Chadwick?

- A He conducted experiments to provide evidence for the existence of the neutron
- B He showed that electrons inhabit different energy levels around the nucleus
- C He came up with the idea of the atom being like a 'plum pudding'
- D He fired alpha particles at atoms to show they have a small, positive nucleus

Your answer ☐

147 Which of the following statements is correct about atomic models over time?

- A The model of the atom hasn't changed in over 200 years
- B The plum pudding model replaced the nuclear model of the atom
- C The Bohr model was replaced by the nuclear model of the atom
- D New models of the atom are accepted when new evidence proves them to be better

Your answer ☐

148 Which of the following statements about the activity of a radioactive source is not true?

- A The activity of a source is measured in becquerel, Bq
- B Activity is the rate at which an unstable nucleus decays
- C The activities of different sources can vary from fractions of a second to many years
- D The activity of a radioactive source will increase as time passes

Your answer ☐

149 Which of the following statements about nuclear radiation is true?

- A The alpha particle is the same as a helium nucleus and has the most mass
- B Beta particles are fast moving electrons that will be stopped by thin paper
- C The neutron is a charged particle that is emitted from the nucleus
- D Gamma radiation is the safest of the four types of nuclear radiation

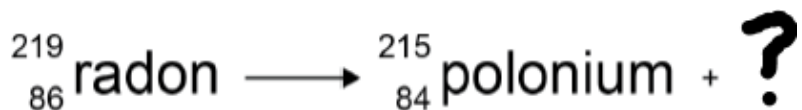
Your answer ☐

150 Which of the following is the most suitable to use in a smoke detector?

- A Gamma rays
- B Alpha particles
- C Neutrons
- D Beta particles

Your answer ☐

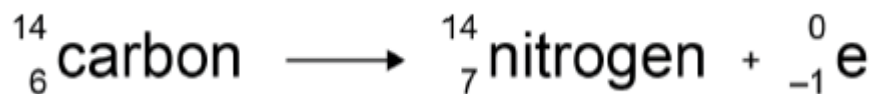
151 What is the missing particle, shown by the question mark, in the decay equation below?



- A Beta particle
- B Neutrons
- C Gamma rays
- D Alpha particle

Your answer ☐

152 What type of decay is being shown below?



- A Alpha decay
- B Beta decay
- C Gamma ray emission
- D Neutron emission

Your answer ☐

153 Which of the following statements is true regarding nuclear decay?

- A When a gamma ray is emitted there is no change in the mass or charge of the nucleus
- B The atomic number of a nucleus goes down by 4 when an alpha particle is emitted
- C When a beta particle is emitted, a proton turns into a neutron
- D An atom will become another element if it loses a neutron from its nucleus

Your answer ☐

154 Which row below correctly describes what happens when a gamma ray is emitted from a radioactive nucleus?

- A The mass goes down by 4
- B The atomic number increases by 1
- C There is no change in the mass or charge of the nucleus
- D The nucleus becomes less stable

Your answer ☐

155 Which of the following best describes word 'random' in terms of radioactive decay?

- A The activity of the source stays the same over time
- B It is not possible to know which nucleus will decay and when it will decay
- C The activity will change dramatically from one moment to another
- D The particles will constantly be changing their position in the material

Your answer ☐

156 Which of the following statements is true regarding nuclear decay?

- A After two half-lives, the activity of a radioactive source will fall to zero
- B The more stable a radioactive nucleus is, the longer its half-life will be
- C The more stable a radioactive nucleus is, the shorter its half life will be
- D Hospital workers do not need to take precautions relating to nuclear decay

Your answer ☐

157 Which of the following statements about contamination and irradiation is not true?

- A Contamination is the unwanted presence of radioactive atoms on materials
- B The hazard from contamination is from the decay of the contaminating atoms
- C Irradiation is the process of exposing an object to nuclear radiation
- D An irradiated object becomes radioactive once exposed to radiation

Your answer ☐

158 Which of the following statements is true regarding 'background radiation'?

- A Background radiation is very harmful to humans
- B Background radiation is only found in certain locations
- C The level of background radiation is not affected by a person's job or location
- D Background radiation can come from natural or man-made sources

Your answer ☐

159 Which of the following is not true regarding nuclear radiation?

- A An alpha source with a long half-life is safe to use inside the human body
- B Nuclear radiation can be used to explore internal organs
- C Radioactive isotopes have a wide range of half-life values
- D Radiation dose is measured in sieverts (Sv)

Your answer ☐

160 Which of the following statements is true in relation to the processes of nuclear fission and nuclear fusion?

- A Nuclear fusion and nuclear fission are both used in nuclear power stations in the UK
- B In nuclear fission, a slow-moving proton is used to split a large nucleus
- C Nuclear fission and nuclear fusion reactions can both release energy
- D The explosion of a nuclear weapon is an example of controlled fission

Your answer ☐

AQA GCSE Physics Equation Sheet
(Equations in **bold** are for H tier only)

1	pressure due to a column of liquid = height of column $\times$ density of liquid $\times$ gravitational field strength (g)	$p = h \rho g$
2	$(\text{final velocity})^2 - (\text{initial velocity})^2 = 2 \times \text{acceleration} \times \text{distance}$	$v^2 - u^2 = 2 a s$
3	$\text{force} = \frac{\text{change in momentum}}{\text{time taken}}$	$F = \frac{m \Delta v}{\Delta t}$
4	elastic potential energy = $0.5 \times$ spring constant $\times$ (extension) ²	$E_e = \frac{1}{2} k e^2$
5	change in thermal energy = mass $\times$ specific heat capacity $\times$ temperature change	$\Delta E = m c \Delta \theta$
6	$\text{period} = \frac{1}{\text{frequency}}$	
7	$\text{magnification} = \frac{\text{image height}}{\text{object height}}$	
8	force on a conductor (at right angles to a magnetic field) carrying a current = magnetic flux density $\times$ current $\times$ length	$F = B I l$
9	thermal energy for a change of state = mass $\times$ specific latent heat	$E = m L$
10	$\frac{\text{potential difference across primary coil}}{\text{potential difference across secondary coil}} = \frac{\text{number of turns in primary coil}}{\text{number of turns in secondary coil}}$	$\frac{V_p}{V_s} = \frac{n_p}{n_s}$
11	potential difference across primary coil $\times$ current in primary coil = potential difference across secondary coil $\times$ current in secondary coil	$V_p I_p = V_s I_s$
12	For gases: pressure $\times$ volume = constant	$p V = \text{constant}$

AQA GCSE Physics (9-1) Multiple Choice Questions.

Multiple Choice Questions 'Mega-Bank'

Paper 1

Foundation Tier

Correct Answers

Answer	Answer	Answer	Answer
1 C	41 A	81 B	121 C
2 C	42 B	82 C	122 D
3 A	43 A	83 A	123 B
4 B	44 D	84 C	124 D
5 A	45 C	85 B	125 D
6 D	46 C	86 A	126 C
7 B	47 D	87 D	127 A
8 C	48 D	88 C	128 D
9 C	49 D	89 D	129 C
10 C	50 A	90 B	130 B
11 A	51 C	91 C	131 A
12 D	52 B	92 B	132 B
13 C	53 A	93 C	133 D
14 A	54 C	94 D	134 B
15 D	55 C	95 B	135 C
16 C	56 B	96 A	136 A
17 B	57 B	97 A	137 D
18 D	58 A	98 C	138 A
19 B	59 A	99 A	139 A
20 D	60 D	100 C	140 C
21 D	61 B	101 B	141 D
22 C	62 B	102 D	142 B
23 A	63 B	103 A	143 D
24 C	64 A	104 B	144 A
25 C	65 C	105 A	145 B
26 A	66 C	106 D	146 A
27 D	67 A	107 A	147 D
28 A	68 C	108 D	148 D
29 B	69 B	109 D	149 A
30 C	70 A	110 B	150 B
31 C	71 B	111 B	151 D
32 C	72 C	112 D	152 B
33 D	73 A	113 A	153 A
34 A	74 B	114 D	154 C
35 C	75 B	115 B	155 B
36 D	76 B	116 B	156 B
37 C	77 C	117 D	157 D
38 D	78 C	118 D	158 D
39 D	79 D	119 C	159 A
40 D	80 C	120 B	160 C