Oxford Cambridge and RSA

GCSE Physics A (Gateway)

J249/04 Physics A P5-P8 and P9 (Higher Tier)

Question Set 28

Multiple Choice Questions

P8: Global Challenges

1 The National Grid transfers energy efficiently using high voltages.

Why are high voltages more efficient?

A High voltages produce a high current which heats wires less.

B High voltages produce a high current which heats wires more.

C High voltages produce a low current which heats wires less.

D High voltages produce a low current which heats wires more.

Your answer ☐

[1]

2 Which row correctly describes the domestic electricity supply in the UK?

	a.c. or d.c.	Frequency (Hz)	Voltage (V)
A	a.c.	50	230
B	a.c.	230	50
C	d.c.	50	230
D	d.c.	230	50

Your answer ☐

[1]

3 What is a typical weight of an empty single decker school bus?

A 1 200 N

B 12 000 N

C 120 000 N

D 1 200 000 N

Your answer ☐

[1]

4 How was the Sun formed?

A From dust and gas pulled together by gravity leading to a fission reaction.
B From dust and gas pulled together by gravity leading to a fusion reaction.
C From dust and gas pushed together by gravity leading to a fission reaction.
D From dust and gas pushed together by gravity leading to a fusion reaction

Your answer ☐

[1]

5 A hockey player used pads on her legs to reduce injuries when hit by the ball.

How do the pads affect the ball?

A The acceleration and force of the ball is increased.

B The acceleration and force of the ball is decreased.

C The acceleration of the ball is decreased and the force is increased.

D The acceleration of the ball is increased and the force is decreased.

Your answer ☐

[1]

6 Which of the following correctly describes the domestic electricity supply in the UK?

A 230 V a.c. at 50 Hz
B 230 V a.c. at 60 Hz
C 230 V d.c. at 50 Hz
D 230 V d.c. at 60 Hz

Your answer ☐

[1]

7 A car accelerates from 0 to 60 mph (miles per hour) in about 9 seconds.

Use the relationship: 1 m/s = 2.24 mph

Estimate the acceleration for this car in m/s^2.

A 1 m/s^2

B 3 m/s^2

C 7 m/s^2

D 15 m/s^2

Your answer ☐

[1]

8 A planet moves in a circular orbit around its star.

Which statement is correct?

A The planet travels at changing speed and changing velocity.

B The planet travels at changing speed but constant velocity.

C The planet travels at constant speed and velocity.

D The planet travels at constant speed but changing velocity.

Your answer ☐

[1]

9 A student measures the time it takes for a bicycle to stop in an emergency.

She repeats the measurement to get three results.

The average time for her results is 2.72 s.

The first two results are 2.66 s and 2.60 s. What is the value of her third result?

A 2.63 s
B 2.66 s
C 2.72 s
D 2.90 s

Your answer ☐

[1]

10 An artificial satellite is kept in its low polar orbit by a gravity force from a planet.

The satellite is moved to a higher orbit above the planet.

Which statement is correct about the satellite in this higher orbit?

A The force of gravity is greater and its speed decreases.

B The force of gravity is greater and its speed increases.

C The force of gravity is less and its speed decreases.

D The force of gravity is less and its speed increases

Your answer ☐

[1]

11 Which row **A**, **B**, **C** or **D**, describes what has happened to light that has undergone red shift?

	Wavelength	**Frequency**
A	Decreases	Decreases
B	Decreases	Increases
C	Increases	Decreases
D	Increases	Increases

Your answer ☐

[1]

12 An adult on a bicycle travels at 8 m/s on a level road. She sees a hazard and applies her brakes using full force.

Estimate the force of the brakes.

A 5 N

B 50 N

C 500 N

D 5000 N

Your answer ☐

[1]

13 Which row in the table shows realistic speeds?

	Speed (m/s)		
	Road cyclist	**Gale force wind**	**Sound in air**
A	40	12	1 000
B	6	24	340
C	20	6	760
D	15	55	250

Your answer ☐

[1]

14 Which statement shows energy resources that are **all renewable**?

A Bio-fuel, wind, hydro-electricity and tides.

B Fossil fuels, bio-fuel, wind and hydro-electricity.

C Fossil fuels, nuclear fuel, hydro-electricity and tides.

D Nuclear fuel, bio-fuel, wind and tides.

Your answer ☐

[1]

15 The table contains statements about red-shift and galaxies.

Which row in the table is correct?

	Statement 1	Statement 2
A	All galaxies move apart at the same speed.	They show both red-shift and blue-shift.
B	Distant galaxies show more red-shift.	The distant galaxies are moving apart faster than nearby ones.
C	Distant galaxies show more red-shift.	The distant galaxies are moving apart slower than nearby ones.
D	There are no galaxies that show blue-shift.	All galaxies are moving away from each other.

Your answer ☐

[1]

16 All bodies emit electromagnetic radiation.

Body **R** is at a higher temperature than body **S**.

Which statement is correct?

A **R** emits radiation with a mean higher frequency.

B **R** emits radiation with a mean longer wavelength.

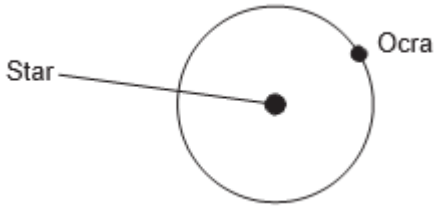
C **S** emits radiation with a higher intensity.

D **S** emits radiation with a mean shorter wavelength.

Your answer ☐

[1]

17 Planet Ocra is in a circular orbit around a star.



Which statement is correct?

A The acceleration of Ocra is zero.

B The speed of Ocra is changing.

C The velocity of Ocra is changing.

D The velocity of Ocra is zero.

Your answer ☐

[1]

18 An artificial satellite orbits the Earth in a circular path.

The satellite is moved further away from Earth to another orbit.

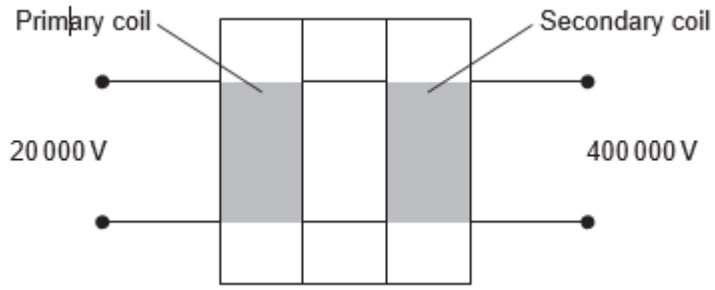
Which row in the table is correct?

	Force of gravity	Speed in orbit	Time period
A	decreases	decreases	decreases
B	decreases	decreases	increases
C	decreases	increases	increases
D	increases	increases	increases

Your answer ☐

[1]

19 This is a diagram of a transformer used in the national grid.



Why is this transformer used in the national grid?

A To decrease the power in the national grid by a factor of 20.

B To decrease the power loss in the national grid by a factor of 400.

C To increase the power in the national grid by a factor of 20.

D To increase the power loss in the national grid by a factor of 400.

Your answer ☐

[1]

Total Marks for Question Set 4: 19

Equations in physics

(final velocity)^2 – (initial velocity)^2 = 2 × acceleration × distance

change in thermal energy = mass × specific heat capacity × change in temperature

thermal energy for a change in state = mass × specific latent heat

energy transferred in stretching = 0.5 × spring constant × (extension)^2

potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil

Higher tier only –

force on a conductor (at right angles to a magnetic field) carrying a current = magnetic flux density × current × length