

Answers – P6 Science Mock Mid-year exam 2021

1) 3

Please read the revision notes for a detailed explanation

>>> <https://scienceshifu.com/light-and-shadow-apply-the-correct-rules/>

The shadow's length increases faster at period Y

2) 2

3) 4

4) 3

5) The answer is 2

Question says, "next five minutes". That means once the lighted candle heats the setup for seven minutes, the candle is removed, and the observation begins.

Immediately after the heat source is removed, the air inside quickly loses heat and contracts. Air inside occupies less space, and the water level rises.

Next, as the flask loses heat, it contracts slowly. The volume inside the flask decreases.

Hence some water will be pushed out of the glass tube and its water level falls.

6) Answer is 3

Option 2 is the heat source. It heats up the air. That does not cause the spiral to spin.

The KE of the rising hot air is converted to the KE of spiral, causing the spiral to spin

7) 2

8) 2

9) 3

10) 2

11) 2

12) 1

13) 4

14) 2

15) 4

16) 4

17) 4

18) 1

19) 2

20) 4

21) 3

22) 4 (Leaves coated with black paint cannot undergo photosynthesis. The plant will use up the starch in the leaves for respiration process.)

23) 3

24) 2

25) 3

26) 3

27) 3 Experiment is conducted in a room. % composition of oxygen in a room is more than carbon dioxide.

28) 4

29a The hot water **evaporates** and turns into **water vapour**, (1m)

Warm water vapour rises and comes into contact with the cooler inner surface of the aluminium sheet. The water vapour **loses heat to the aluminium sheet and condenses to form water droplets**, which drip down into the cup. (1m)

29b The ice cubes cooled the aluminium sheet down. (0.5m)

OR

The aluminium sheet loses heat to the ice cubes.

Since the **temperature difference between the water vapour and aluminium sheet is greater**, (0.5m)

Water vapour loses heat and condenses on the aluminium sheet **faster** to form **more** water droplets. (1m)

30a X (1m)

30b The air in B is a **poorer** conductor of heat compared to the cotton in A, so (1m) the hot water lost heat to the surroundings at a **slower** rate and the water took a **longer time** to cool down. (1m)

31a Material A allows the **most amount of light to pass through followed by material B and (then) C.**

OR

Material C allows the least amount of light to pass through, material B allows more light to pass through than material C and material A allows the most amount of light to pass through.

OR

Material C is **opaque**, material B is **translucent** and material A is **transparent**.

31b As the **amount of light that passes through the materials increased**, the **temperature recorded by the data logger increased/became higher**.

OR

The **greater** the amount of light that passes through the materials, the **higher** the **temperature recorded by the data logger was placed**.

OR

As the amount of light that passed through the materials decreased, the temperature recorded by the data logger decreased.

31c **Material C** should be used as **no light was detected (0.5m)** by the data logger when Material C was used.

Hence it is **opaque / does not allow any light to pass through (0.5m)**

No light reaches the solar panel. Solar panel cannot convert light energy to electrical energy (1m) and the toy will not spin.

32) (a) Green colour.

(b)

The **green light is not absorbed by the plant** (0.5m) but is **reflected from the surface** of the leaves **into our eyes**. (0.5m)

Hence, we see the plant as green in colour.

(c) Violet, blue, yellow, orange, red (choose any 2)

33) (a) There are **more** worms **respiring** by taking in **more oxygen** and producing **more carbon dioxide** in set-up Y than set-up X. (1m)

As a result, the chemical will absorb **more carbon dioxide** and there will be **less air occupying lesser space** in container Y than X. The ink at Y will move further to the left compared to X. (1m)

(b)

Make the set-up to be the **same as setup X or Y** with **no worms in it**. (1m)

34 a) Position ~~C~~ A

34 b) The **greater the distance between the tap and water wheel**, the **faster the water wheel will spin**. (1m)

34 c) When the distance between the tap and water wheel increases, **more gravitational potential energy** of the water is converted to **more kinetic energy** it falls. (1m)

The water hits the water wheel with **greater impact and converts / transfers more kinetic energy** to the **water wheel**, causing it to spin faster. (1m)

35a) Electrical energy → Heat energy of heating device → Heat energy of water
→ Kinetic energy of steam → Kinetic energy of wheel

35b) The wheel in Set-up B will turn faster speed than that of Set-up A.

35c)

Since Set-up B has **2 heating coils**, the water in Set-up B will **gain heat and boil at a faster rate** than that of Set-up A to produce **more steam**, which rises and causes the wheel to turn **faster**.

36a) Plant → C → A → B

36b) They had no water or food, resulting in both organism B and C dying of starvation.

36c) Organism E preyed on Organism A leading to the decrease in Organism A's population. (1m)

Since Organism A preys on Organism C, a decrease in A's population will lead to an increase in C's population. (0.5m)

More C feeds on plants, hence the population of the plant decreased. (0.5m)

37a) E

37b) B,C, D, F (1 missing / wrong alphabet, deduct 1 mark. 2 missing/wrong alphabets, deduct 2 marks.).

37c) Organism A: Population size will increase (1m)

Reason: Since **Z preys on D**, there will be **less D to prey on A**, resulting in an **increase in the population size of A**. (1m)

Organism F: Population size will decrease (1m)

Reason: Since **Z and F both prey on D**, there will be **less food available for F**, hence **some F will die of starvation**. (1m)

38) a) B is the **predator** of E / E is the **prey** of B

Reject answer: As population of B increase, population of E decreases.

The question did not tell you any increase in population of organisms.

b) 5

- 1) $D \rightarrow E$
- 2) $A \rightarrow E \rightarrow B$
- 3) $A \rightarrow F \rightarrow B$
- 4) $A \rightarrow F \rightarrow G$
- 5) $A \rightarrow C$

c) No. F is a **herbivore**. It feeds on **Organism A which is a food producer** (0.5m) and it is preyed on by Organisms B and G. (0.5m)

A **predator** is **an organism that feeds on other animals**, hence Organism F is not considered as a predator. (1m)

d) Organism D's population would **decrease**. (0.5m)

As population of B decreases, there are **fewer organism B feeding on / preying on organism E**. (1m)

Population of E would increase and **more E would feed on D**. (0.5m)