



Stage II



Grades 4-6

CREST Teacher Science Olympiad (CTSO)

Sample Paper

Pattern and Marking Scheme

Stage	Topic/Section	No. of Questions	Marks per Question	Total Marks
For stage II (Grades 4-6)	Practical Science	30	3	90
	Achiever's Section	20	6	120
Grand Total		50		210

The total duration of the exam is 60 minutes.

Note: For every incorrect answer, there's a penalty of 1/3rd of the total marks allotted to that question.

Syllabus

Plants, Food and Its Components, Animals, Human Body Systems, Properties and Changes in Matter, Force, Work, Energy, Our Environment, Earth and Universe, Natural Resources and Calamities, Fibre to Fabric, Elements, Compounds and Mixtures, Changes Around Us, Living Things in the Biosphere, Motion and Acceleration, Light, Electricity, Magnetism

For more details visit: <https://www.crestolympiads.com/teacher-science-olympiad>

Practical Science (Each Question is 3 Marks)

1. Find an incorrect match from the following:

	Vitamins	Functions
A.	C	Maintains healthy gums, teeth and skin
B.	D	Essential in blood clotting
C.	A	Allows us to see in dim light
D.	B	Maintains a healthy nervous system

- a. A b. B
c. C d. D

2. Identify the food item that matches the following composition:

Carbohydrates	70%
Water	22%
Mineral salt	8%

- a. Fish b. Soya bean
c. Fresh milk d. Rice

3. Which among the following is/are incorrectly matched?

1. Virus – Common cold
2. Fungi – Typhoid
3. Bacteria – Ringworm
4. Protozoa – Malaria

- a. Only 2 b. Only 3
c. Both 2 and 3 d. Both 3 and 4

4. Match the following:

	Column A		Column B
1.	Mercury	a.	It rotates at a nearly 90 degree angle
2.	Mars	b.	It is the fastest planet in our solar system

3.	Uranus	c.	It has two moons named Phobos and Deimos.
4.	Saturn	d.	Nine Earths side by side would almost span it's diameter.

- a. 1 - b, 2 - c, 3 - a, 4 - d
b. 1 - b, 2 - c, 3 - d, 4 - a
c. 1 - c, 2 - b, 3 - d, 4 - a
d. 1 - d, 2 - b, 3 - a, 4 - c

5. Match the following:

	Column A		Column B
1.	Rayon	a.	It is the world's first Synthetic fabric.
2.	Nylon	b.	It is produced from the extract of wood pulp and some chemicals
3.	Wool	c.	Shrinks away from the flame
4.	Cotton	d.	Burn with the smell of burning paper

- a. 1 - b, 2 - a, 3 - c, 4 - d
b. 1 - b, 2 - c, 3 - a, 4 - d
c. 1 - a, 2 - b, 3 - c, 4 - d
d. 1 - a, 2 - b, 3 - d, 4 - c

6. Which statement explains why populations in upper trophic levels tend to have less total mass than populations in lower trophic levels?

- a. Populations in upper trophic levels are more complex than populations in lower trophic levels.

- b. Populations in upper trophic levels have less available habitat than populations in lower trophic levels.
- c. Populations in upper trophic levels have less available energy than populations in lower trophic levels.
- d. Populations in upper trophic levels have more nutrient requirements than populations in lower trophic levels.
7. When a lion eats a zebra and then uses the energy from the zebra to run, the lion's body converts:
- a. Chemical energy to mechanical energy
- b. Electrical energy to chemical energy
- c. Chemical energy to light energy
- d. mechanical energy to chemical energy
8. Pam wants to carry out an experiment to investigate how the amount of salt added to water affects its boiling point. Which of the following variable(s) should be kept the same?
- A. The source of water
- B. The amount of salt
- C. The volume of water
- D. The boiling point of water
- a. A only
- b. B only
- c. A and C only
- d. A, B, C and D only
9. Which of the following statement(s) is/are incorrect?
- A: All green plants can make their own food.
- B: Plants produce starch and oxygen during photosynthesis.
- C: Respiration occurs only at night while photosynthesis occurs only during the day.
- D: Leaves that are partially green can make their own food.
- a. A only
- b. B only
- c. B and C only
- d. A and D only
10. Which of the following shows water losing heat as it changes from one state to another?
- a. A cube of ice melting.
- b. A puddling of rainwater drying up.
- c. Water droplets forming on the side of a glass.
- d. All of the above
11. Consider the following clues and identify the planet:
- Clue 1: It is the only planet in our solar system not visible to the naked eye.
- Clue 2: It is about four times wider than Earth.
- Clue 3: Most of its mass is a hot, dense fluid of "icy" materials – water, methane and ammonia.
- a. Uranus
- b. Neptune
- c. Jupiter
- d. Venus
12. Consider the following statements and choose the correct option:
- Statement 1: The female silk moth lays eggs, from which hatch larvae which are called caterpillars or silkworms.
- Statement 2: caterpillar completely covers itself with silk fibres and turns into pupa. This covering is known as cocoon.
- a. Statement 1 is correct but statement 2 is incorrect.
- b. Statement 1 is incorrect but statement 2 is correct.
- c. Both the statements are correct.
- d. Both the statements are incorrect.
13. Which of the following is a protein-based fibre that has high absorbency, good strength and high lustre?
- a. Wool
- b. Silk
- c. Cotton
- d. Asbestos

14. Which of the following is a physical change?

1. Making hydrogen from water
2. Rusting of iron
3. Casting silver in a mould
4. Burning of camphor

- a. Only 1 b. Only 3
c. Both 1 and 3 d. Both 2 and 4

15. Consider the following sentences and choose the correct option:

Statement 1: First order levers have the turning point(fulcrum) between the load and the effort.

Statement 2: In a first-order lever, force is increased if the effort moves a larger distance than the load.

Statement 3: Screwdriver, windmill, and pizza cutter are examples of third - order lever.

- a. Statement 1 is correct but statement 2 and 3 are incorrect
- b. Statement 1 is incorrect but statement 2 and 3 are correct
- c. Statement 3 is incorrect but statement 1 and 2 are correct
- d. Statement 2 is incorrect but statement 1 and 3 are correct

16. Which of the following is a mixture?

- a. Salt and water
- b. Food colouring and water
- c. Lemonade
- d. Fruit salad

17. Sodium chloride can be separated from rock salt by first adding water to the mixture to dissolve the sodium chloride. The separation then takes place in two stages:

- a. Evaporation followed by filtration
- b. Filtration followed by decanting
- c. Filtration followed by evaporation
- d. Distillation followed by decanting

18. Erosion is one of the processes involved in the formation of sedimentary rock. Which of these best describes the process of erosion?

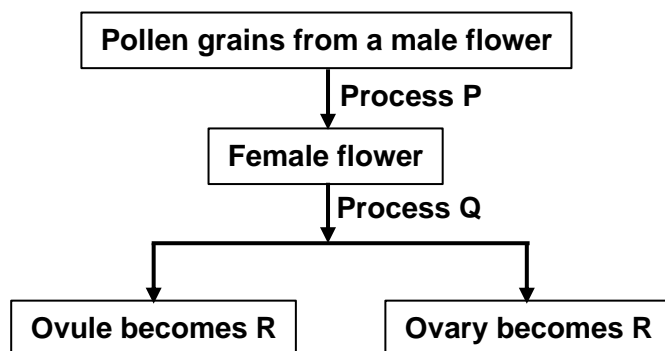
- a. Rocks are broken into smaller pieces that remain in the same location.
- b. Pressure compacts layers of sediment and turns them into rock.
- c. Pieces of rock or soil are carried from one place to another.
- d. Sediment grains fall to the bottom of a lake to form sedimentary layers.

19. Which of the following processes is/are exothermic?

1. Reaction of sodium with water
2. The use of petrol in an engine
3. Distilling crude oil
4. Burning fossil fuels

- a. Only 1
b. 2 and 3 only
c. 3 and 4 only
d. 1, 2 and 4 only

20. The diagram below shows how a flowering plant reproduces. Which of the following do P, Q, R and S represent?



- a. P: Fertilisation, Q: Pollination, R: Fruit, S: Seed
- b. P: Pollination, Q: Fertilisation, R: Fruit, S: Seed
- c. P: Pollination, Q: Fertilisation, R: Seed, S: Fruit
- d. P: Fertilisation, Q: Pollination, R: Seed, S: Fruit

21. Consider the following statements and choose the correct option:

1. The swinging motion of swing and motion of a pendulum are examples of oscillatory motion.
2. The blades of a fan, blades of a windmill are example of rotatory motion.

- a. Statement 1 is correct but statement 2 is incorrect.
- b. Statement 1 is incorrect but statement 2 is correct.
- c. Both the statements are correct.
- d. Both the statements are incorrect.

22. Leonard walks 100 m in half a minute. What must his speed have been to travel this distance?

- a. 3.33 m/s
- b. 30 m/s
- c. 40.7 m/s
- d. 3.8 m/s

23. To move a ball from the floor to a table top, it is first moved vertically and then horizontally. Which of the following types of motion is the motion of the ball an example of?



- a. Translational motion
- b. Periodic motion
- c. Circular motion
- d. Rotatory motion

24. The ant's aunt travels from the 15.00 cm mark to the 95.00 cm mark back to the 20.00 cm mark and then finally to the 30.00 cm mark. What is the ant's aunt's displacement?

- a. 15 cm
- b. 20 cm
- c. 55 cm
- d. 65 cm

25. The diagram below shows a girl looking at a book under a lamp.

Which of the following explains why the girl can see the book?



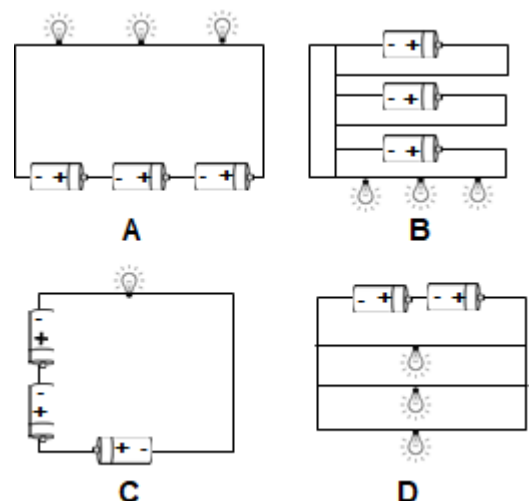
- a. Light from the girl's eyes shines onto the book and is reflected into the lamp.
- b. Light from the book shines onto the girl's eyes and is reflected into the lamp.
- c. Light from the lamp shines onto the book and is reflected into the girl's eyes.
- d. Light from the book shines onto the lamp and is reflected into the girl's eyes.

26. Fill in the blank:

The image of an object as formed by a plane mirror is located ____.

- a. in front of the mirror surface
- b. on the mirror surface
- c. behind the mirror surface
- d. any of the above, depending on the object's location.

27. The diagram below shows some electrical circuits. Which 2 circuits will produce the brightest lit bulbs?



- a. A and B only b. B and C only
c. C and D only d. A and D only

28. Consider the following and choose the correct statement:

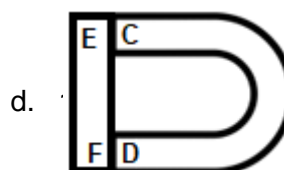
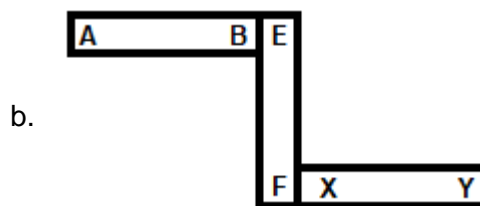
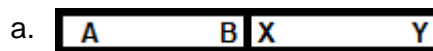
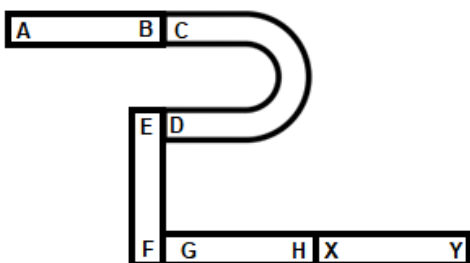
Statement 1: The thin wire inside the body of the bulb is called the filament of the bulb. The filament is usually made of very thin tungsten wire.

Statement 2: It is the filament of the bulb which glows when electricity from the cell is passed through it.

- a. Statement 1 is correct but statement 2 is incorrect.
b. Statement 1 is incorrect but statement 2 is correct.
c. Both the statements are correct.
d. Both the statements are incorrect.

29. The diagram below shows 5 magnets with their ends labelled. The magnets are arranged so that they are attracted to one another.

Based on the above diagram, which of the following arrangements of magnets is not possible?



30. Fossil fuels formed over long periods of time after particles in water settled to the sea floor and formed marine mud. What kinds of particles needed to be present in the marine mud in order for fossil fuels to form?

- a. Mostly sand and a few small bits of wood
b. Mostly decaying organisms
c. Mostly lava and a few sedimentary rocks
d. Mostly metal minerals

Achievers' Section (Each Question is 6 Marks)

31. The chart lists organisms in five categories living near the Place X. Based on the chart, which food chain best models the energy flow in this ecosystem?

Vegetation	Mammals	Invertebrates
<ul style="list-style-type: none"> Algae Willow oaks 	<ul style="list-style-type: none"> River otter coyotes 	<ul style="list-style-type: none"> Shrimp Mosquitoes

Fish	Birds
<ul style="list-style-type: none"> Red drum Pygmy sunfish 	<ul style="list-style-type: none"> Laughing gulls Wood ducks

- a. Sun - Mosquito - Shrimp - Coyotes
b. Sun - Algae - Shrimp - Red drum
c. Sun - Pygmy sunfish - Shrimp - Wood ducks
d. Sun - Willow oaks - Algae - River otters

32. Consider the following statements and choose the correct option:
Statement 1: The brightness of a bulb remains the same when more bulbs are connected in a series circuit.

Statement 2: The role of a fuse in an electric circuit is to break the circuit in case of excessive current.

- a. Statement 1 is correct but statement 2 is incorrect.
- b. Statement 1 is incorrect but statement 2 is correct.
- c. Both the statements are correct.
- d. Both the statements are incorrect.

33. Consider the following statements and choose the correct option:
Statement 1: The brightness of a bulb remains the same when more bulbs are connected in a series circuit.

Statement 2: The role of a fuse in an electric circuit is to break the circuit in case of excessive current.

- a. Statement 1 is correct but statement 2 is incorrect.
- b. Statement 1 is incorrect but statement 2 is correct.
- c. Both the statements are correct.
- d. Both the statements are incorrect

34. Which of the following is not a way to make a temporary magnet?
- 1. Stroking a permanent magnet on an iron nail
 - 2. Heating a magnet
 - 3. Placing a magnet near a magnetic material
 - 4. Using an electric current

- a. Only 1
- b. Only 2
- c. Both 2 and 4
- d. Both 3 and 4

35. When a magnet is broken into two pieces, each piece:
- 1. Becomes a smaller magnet with its own north and south poles
 - 2. Loses its magnetic properties
 - 3. Becomes weaker

- 4. Has one end with only a north pole and the other end with only a south pole

- a. Only 1
- b. Only 4
- c. Both 2 and 3
- d. Both 3 and 4

36. Which of the following activities involves mismanagement of non-biodegradable waste?

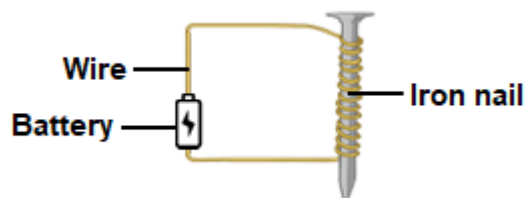
- 1. Composting of vegetable peels
- 2. Recycling of glass bottles
- 3. Burning of plastic bags
- 4. Planting trees

- a. Only 1
- b. Only 3
- c. Both 2 and 3
- d. Both 3 and 4

37. Leo set up an electromagnet as shown below.

What could Leo do to increase the strength of the electromagnet?

- A. Use a longer nail
- B. Use a longer wire
- C. Use more batteries
- D. Coil more wire around the nail



- a. A and B only
- b. B and C only
- c. B and D only
- d. C and D only

38. Read the given paragraph here few words have been italicised and select the correct statement regarding them.

Distillation is the process whereby a liquid is purified by being turned into a vapour (gas) and then allowing the *vapours* to *condense* in another container. *Distillation* is used for separating:

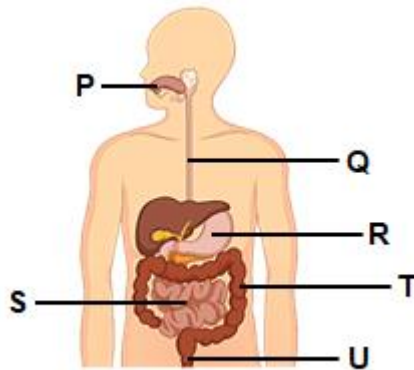
- * two or more liquids mixed together;
- * dissolved *solids* from liquids.

- a. *Distillation* should be replaced with *evaporation*

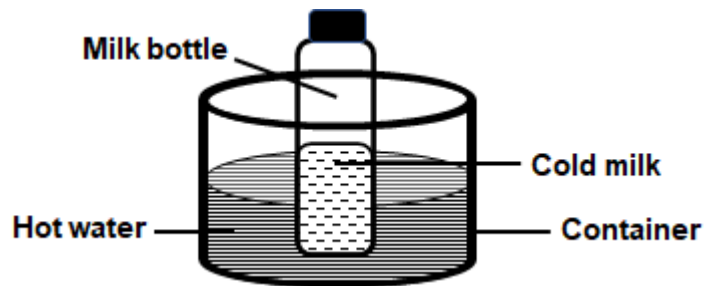
- b. *Condense* should be replaced with *boiling*
- c. *Solids* should not be replaced as it is correctly mentioned
- d. *Vapours* should be replaced by *liquid*

39. The diagram below shows parts of the digestive system of a human. Which of the following statements about this system is/are correct?

A: Food is broken into smaller pieces in part P.
 B: Digestive juices in part R help to digest the food further.
 C: Digested food in part S is absorbed into the bloodstream.
 D: Parts T and S remove water from the undigested food.

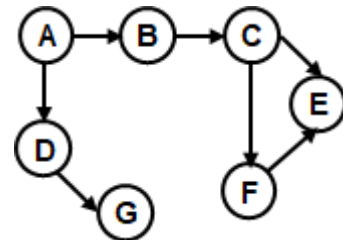


- a. A only
 - b. A, B and C only
 - c. B, C and D only
 - d. A, B, C and D
40. Kate removed a bottle of milk from the refrigerator and placed the bottle in a container containing hot water as shown below. Which of the following statements are correct?
- A: The cold milk loses heat to the hot water.
 B: The container gains heat from the hot water.
 C: The hot water loses heat to the cold milk.
 D: The temperature of the cold milk decreases.



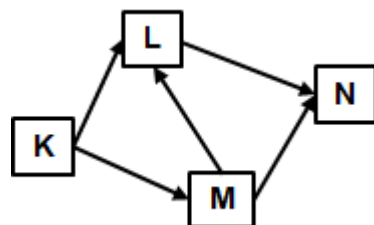
- a. A and B only
- b. A and D only
- c. B and C only
- d. C and D only

41. The food web below shows the relationship among the organisms in a habitat. Study the food web and answer. How many organisms are both a prey and a predator?



- a. 1
- b. 2
- c. 3
- d. 4

42. The food web below shows the relationship among the organisms K, L, M and N in a habitat. Organism X was then introduced into the habitat it fed on only one type of organism in the food web. After one month, all the other organisms decreased in number. Which organism did X most likely feed on?



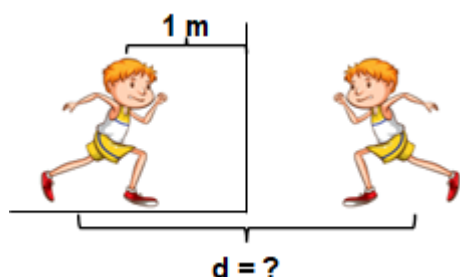
- a. K
- b. L
- c. M
- d. N

43. A beetle travels at a speed of 9 cm/s, it travels a distance of 108 cm before it is caught in a jar. How long did the beetle run for?

- a. 10 s b. 12 s
c. 14 s d. 18 s

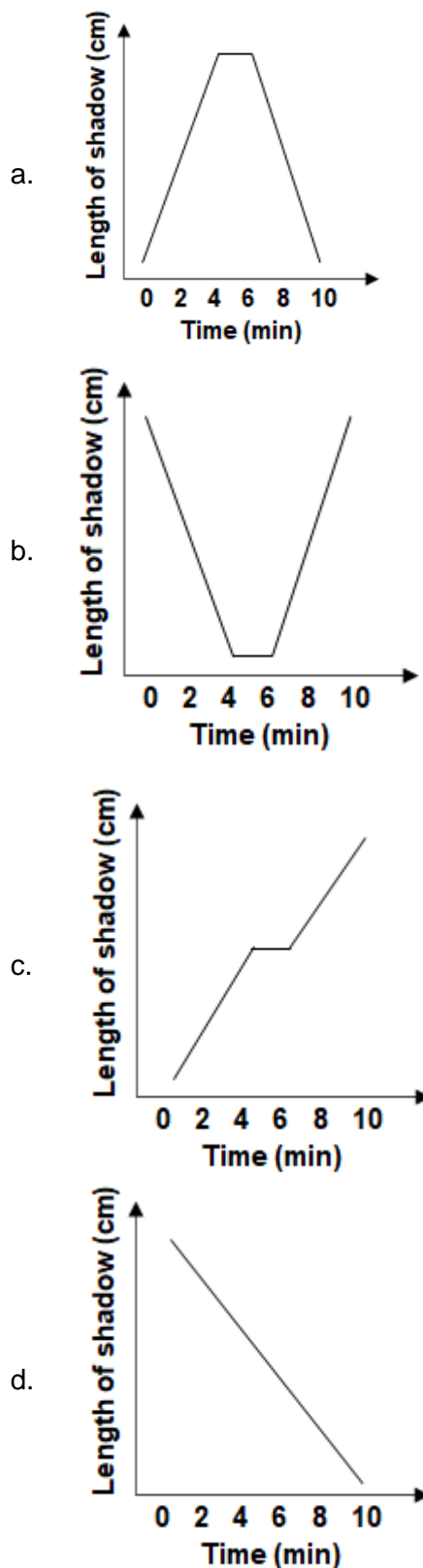
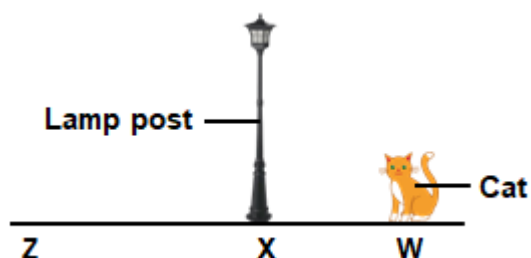
44. Sara drives 64.8 km from work at a speed of 48 km/h. Nora drives 81.2 km from work at a speed of 58 km/h. They both leave work at the same time.
- Who arrives home first?
 - How many minutes later is it before the second person gets home?
- a. I - Sara, II - 3 minutes
b. I - Nora, II - 3 minutes
c. I - Sara, II - 5 minutes
d. I - Nora, II - 5 minutes

45. If you are standing 1 m in front of a plane mirror, what is the distance between you and your reflected image?

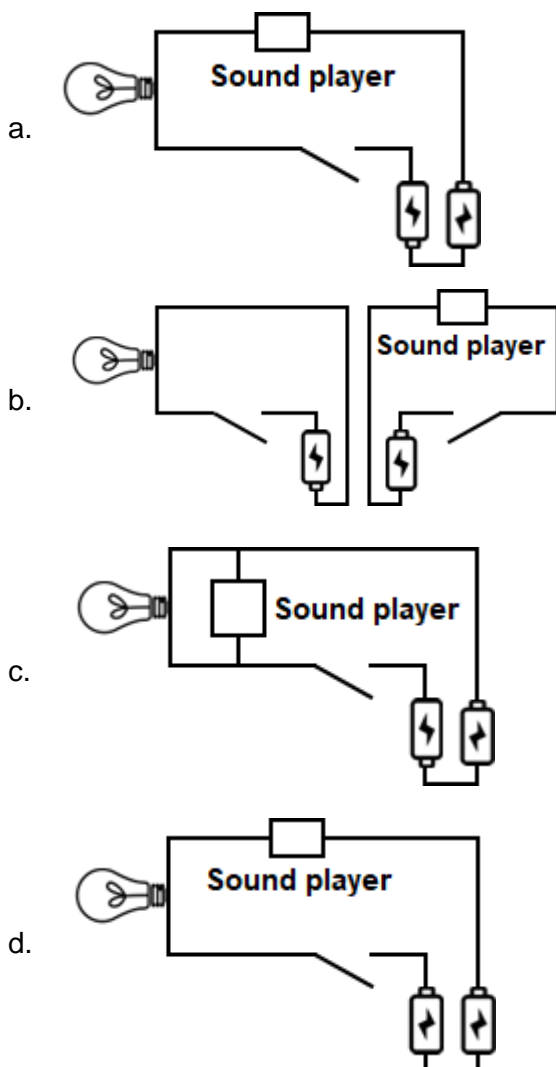
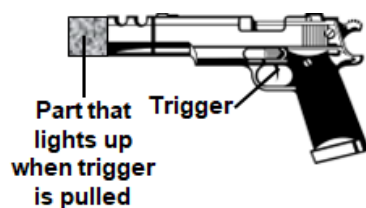


- a. 1 m b. 1.5 m
c. 2 d. 3 m

46. The diagram below shows a cat walking from point W to point Z, passing a lightly lit lamp post at point X. The cat took 10 minutes to walk from point W to point Z. Along the way, it sat down under the lamp post for about 2 minutes to rest. Which one of the following graphs shows correctly how the length of the cat's shadow would change as it walked from point W to point Z?



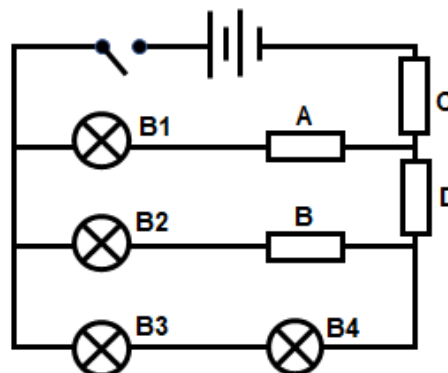
47. The diagram below shows a battery powered toy gun. When the trigger is pulled, the toy gun makes a sound and the tip of the gun lights up. Which one of the following could be a possible circuit of the toy gun?



48. Harry set up an electrical circuit as shown below. In the circuit, he placed objects A, B, C, and D, each made of different materials. When he closed the switch, certain bulbs lit up. He recorded the data in the given table.
- Which of the following options accurately represents what Harry observed in his investigation?

Bulb	Did the bulb light up?
B1	Yes
B2	No
B3	Yes

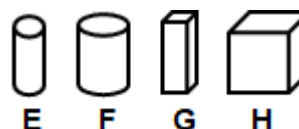
B4	Yes
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- a. A: Conductor, B: Insulator, C: Conductor, D: Conductor
- b. A: Conductor, B: Insulator, C: Conductor, D: Insulator
- c. A: Insulator, B: Insulator, C: Conductor, D: Conductor
- d. A: Conductor, B: Insulator, C: Insulator, D: Conductor
49. Peter has four magnets, E, F, G and H, as shown below.
- To compare the strength of the magnets, he put each of the magnets near a tray of pins. The table below shows the number of pins attracted by the magnets, E, F, G and H, from various distances.

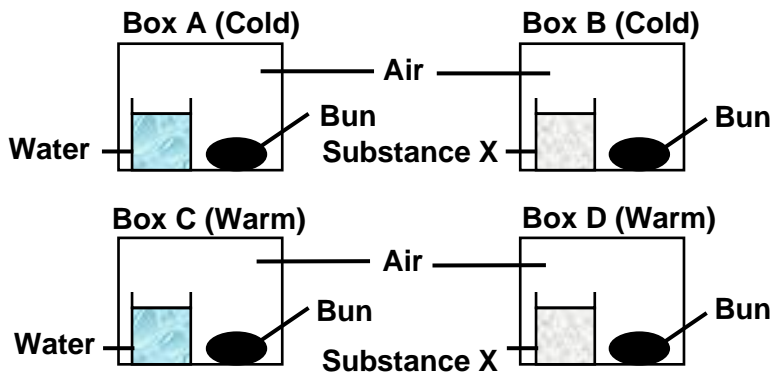
Magnet	Distance between the magnet and the pins (cm)	Number of pins attracted
E	5	10
F	4	10
G	6	8
H	4	12

Which of the following statements is definitely correct?



- a. H is the strongest magnet
- b. F is as strong a magnet as H.
- c. E is a stronger magnet than F.
- d. F is a stronger magnet than G.

50. Jack placed four buns in four identical sealed boxes. Boxes A and B were placed in a cold place and boxes C and D were placed in a warm place. He placed a beaker of water in Box A and Box C. Substance X was used to absorb the moisture in Box B and Box D. In which box A, B, C or D would mould first appear on the bun?



- a. A b. B
c. C d. D

Answer Key

- | | | | | | | | | | |
|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. b | 2. d | 3. c | 4. a | 5. a | 6. c | 7. a | 8. c | 9. c | 10. c |
| 11. b | 12. c | 13. b | 14. b | 15. c | 16. d | 17. c | 18. c | 19. d | 20. c |
| 21. c | 22. a | 23. a | 24. a | 25. c | 26. c | 27. a | 28. c | 29. d | 30. b |
| 31. b | 32. d | 33. b | 34. b | 35. a | 36. b | 37. d | 38. c | 39. b | 40. c |
| 41. d | 42. a | 43. b | 44. a | 45. c | 46. b | 47. a | 48. a | 49. c | 50. c |