Grade 9 Final Exam Model Paper 2

MODEL PAPER

Full marks 75 · 3 hours

Name _____ Class _____ Roll no. ____ Date _____ Marks _____ / 75

All questions are compulsory. Time: 3 hours.

A practice paper by Science Playground, made to CDC's Specification Grid 2078, Grade 9 Science and Technology; not an official CDC or exam board paper. Mark it yourself online: the QR code below opens the paper with its answers.

Section A

10 × 1 = 10

1. Choose the correct option for each of the following questions.

a. *Nostoc* grows as blue-green threads in rice fields. Its cells have no proper nucleus, and it makes its own food by photosynthesis. In which kingdom is it placed?

(i) Monera (ii) Protista (iii) Fungi (iv) Plantae

b. In a district where the same insecticide was sprayed every year, most mosquitoes are no longer killed by it. Which explanation follows Darwin's theory of natural selection?

(i) The mosquitoes tried hard to resist the poison, and their young were born resistant.
(ii) A few mosquitoes were already able to survive the poison; they lived and bred, and their young inherited this.
(iii) The insecticide changed every mosquito so that it could not be killed.
(iv) Mosquitoes that did not use their wings became resistant.

c. A pot plant on a window sill bends its shoot towards the window. Why?

(i) Auxin collects on the lit side, so that side grows faster.
(ii) Auxin collects on the shaded side, so that side grows faster.
(iii) Ethylene makes the stem soft on the lit side.
(iv) Cytokinin stops the stem from growing on the shaded side.

d. Suman drops a stone from a bridge over the Trishuli river. It hits the water 2 s later. Ignoring air resistance, how fast is it moving when it hits the water? ($g = 9.8\ m/s^2$)

(i) 4.9 m/s (ii) 9.8 m/s (iii) 19.6 m/s (iv) 39.2 m/s

e. Workers load a heavy drum of oil onto a truck by rolling it up a long plank instead of lifting it. Why is this easier?

(i) The plank reduces the weight of the drum.
(ii) A smaller effort is needed, though it acts over a longer distance.
(iii) Less work has to be done than in lifting.
(iv) The plank changes the direction of gravity.

f. In which unit is the electrical energy on a household electricity bill measured?

(i) watt (ii) joule (iii) kilowatt-hour (iv) volt

g. In which orbit do GPS (navigation) satellites go round the Earth?

(i) Low Earth Orbit (ii) Medium Earth Orbit
(iii) Geostationary Earth Orbit (iv) the Moon's orbit

h. The atoms of element X have the electronic configuration 2, 8, 2, and those of element Y 2, 6. Which is true of the compound they form?

(i) Its formula is XY, and it has an electrovalent bond.
(ii) Its formula is XY_2, and it has a covalent bond.
(iii) Its formula is X_2Y, and it has an electrovalent bond.
(iv) Its formula is XY, and it has a covalent bond.

i. Temple bells in Nepal are made of metal. Which property of metals makes them suitable?

(i) They are malleable. (ii) They conduct heat.

(iii) They are sonorous. (iv) They have high melting points.

j. A statement and two arguments are given below.

Statement: Diamond and graphite are allotropes of carbon.

Argument 1: Both burn in oxygen to give only carbon dioxide.

Argument 2: Both are good conductors of electricity.

(i) The statement and argument 1 are correct, but argument 2 is incorrect.
(ii) The statement and argument 2 are correct, but argument 1 is incorrect.
(iii) The statement is correct, but both arguments are incorrect.
(iv) The statement and both arguments are correct.

Section B

9 × 1 = 9

2. Write very short answers to the following questions.

a. When diluting a concentrated acid in the laboratory, the acid is added slowly to water, never water to the acid. Why?

b. What is acceleration due to gravity? Write its average value near the Earth's surface.

c. Standing in front of a tall cliff at Bandipur, Abdul claps and hears the echo 0.8 s later. If sound travels at 340 m/s in air, how far is the cliff?

d. Why are the lights and appliances of a house connected in parallel?

e. FM radio sounds clearer than AM radio. Why?

f. Nisha wants to post a photo of herself in her school uniform, with the name of her school and the exact location of her home, on a public social media account. Write one change she should make, and why.

g. How is hydrogen gas tested?

h. Sodium is stored under kerosene, but gold can be kept in the open air for years. Give a reason.

i. Farmers grow a legume such as lentils between rice and wheat. How does this help the soil?

Section C

14 × 2 = 28

Write short answers to the following questions.

3. A measuring cylinder is marked 50 mL and 60 mL, with 5 small divisions between the two marks. The water in it stands 3 small divisions above the 50 mL mark. **[2]**

i. What is the least count of the cylinder?

ii. What is the volume of the water?

4. Write any two advantages of the binomial system of nomenclature. **[2]**

5. Rabina wants to grow oyster mushrooms in bags of paddy straw. To save firewood, she plans to use the straw straight from the field without boiling it. What is likely to happen to her bags? Give a reason, and suggest what she should do. **[2]**

6. *Archaeopteryx* is called a connecting link. Why? Explain with its features. **[2]**

7. While picking raspberries, Ganesh pricks his finger on a thorn and pulls his hand back at once. Show the path of this message with a flow chart, and name the kind of action. **[2]**

8. State Newton's third law of motion, and write one example of it. **[2]**

9. Kushal says, "A truck full of sand and an empty truck going at the same speed can be stopped in the same time by the same braking force." Do you agree? Give a reason. **[2]**

10. Waves travel along a long rope tied to a post. Five complete waves pass a point in 2 s, and the length of one wave is 0.4 m. Calculate: **[2]**

i. the frequency of the wave;

ii. its velocity.

11. Betelgeuse, at the shoulder of Orion, looks reddish, while Sirius looks bluish white. Which of the two stars has the hotter surface? Explain. **[2]**

12. When Muna in Ilam talks to her brother in Kathmandu on a mobile phone, which parts of the call are the transmitter, the channel and the receiver? Explain. **[2]**

13. Prakriti keeps getting hurtful messages and edited photos of herself from a classmate in a class chat group. Write any two things she should do. **[2]**

14. Write the molecular formula of aluminium oxide by the criss-cross method, and calculate its molecular mass. (Al = 27, O = 16) **[2]**

15. For burning magnesium in air, Aadarsh writes $Mg + O_2 \rightarrow MgO$ and says it is a balanced equation. Is he right? Explain, and write the correct equation. **[2]**

16. A statement is given below. Do you agree with it? Give two reasons. **[2]**
Statement: Using HFCs instead of CFCs in refrigerators protects the ozone layer, but it is not a complete answer to the problems these gases cause.

Section D

7 × 4 = 28

Write long answers to the following questions.

17. Write one function each of parenchyma, collenchyma, sclerenchyma and xylem. **[4]**

18. Read the given passage and answer the questions that follow. **[4]**

> On a field trip in Chitwan, Grade 9 students saw these: a lichen growing on a tree trunk, made of a fungus and an alga living together; a white cattle egret walking beside a grazing buffalo, catching the insects it stirred up; two goats pulling at the same bunch of grass; and, at the health post, a poster about tapeworms that live in the human intestine.

Name the type of interaction in each, and explain your answer.

i. the fungus and the alga in a lichen (1)

ii. the cattle egret and the buffalo (1)

iii. the two goats (1)

iv. the tapeworm and the human (1)

19. Read the given passage and answer the questions that follow. **[4]**

> The canteen of a school in Jumla cooks lunch for 300 students on firewood stoves. A local group offers to supply carbonized briquettes made from forest weeds and the husk of crops. The cook plans to use a briquette stove in the closed store room in winter to keep warm.

i. Write any two advantages for the school of using briquettes instead of firewood. (2)

ii. Briquettes are a renewable source of energy. Why? (1)

iii. Is the cook's plan safe? Give a reason. (1)

20. i. How do bats find insects in the dark? (1) **[4]**

ii. The walls of a new cinema hall in Butwal are covered with soft boards and heavy curtains. Why? (1)

iii. Explain how a ship finds the depth of the sea with SONAR. (2)

21. Sonam's family uses these appliances every day: five LED bulbs of 9 W each for 6 hours, a television of 100 W for 5 hours, a rice cooker of 600 W for 1.5 hours, and an iron of 1,000 W for 30 minutes. **[4]**

i. Calculate the energy used by the five bulbs in a day. (1)

ii. Calculate the total energy used by all the appliances in a day. (1)

iii. How many units of electricity does the family use in a month of 30 days? (1)

iv. Find the monthly bill if one unit costs Rs 10. (1)

22. i. What is nuclear fission? Explain it with the example of uranium-235. (2) **[4]**

ii. What is nuclear fusion? Explain how it gives the Sun its energy. (2)

23. Read the given passage and answer the questions that follow. **[4]**

> Dil Bahadur grows cauliflower in Dhading. Insects are eating his crop, and he has bought a chemical insecticide. He plans to spray it in shorts and sandals on a windy afternoon, facing the wind, and to sell the cauliflower at Kalimati market the next morning.

i. Point out any two mistakes in his plan, and say what he should do instead. (2)

ii. Suggest a bio-insecticide he could make at home, and write how it is made. (1)

iii. DDT, which was once sprayed on crops, is now banned in Nepal. Why? (1)