Grade 9 Final Exam Model Paper 1

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. Under a microscope, Junu sees a living thing in pond water. It has only one cell, with a true nucleus inside a nuclear membrane, no cell wall, and it catches its food by pushing out false feet (pseudopodia). In which kingdom should it be placed?

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

b. The wing of a sparrow and the wing of a butterfly both help them fly. The sparrow's wing is a forelimb with bones and feathers; the butterfly's is a thin sheet with no bones at all. What kind of organs are these wings?

(i) homologous organs, because they do the same job
(ii) analogous organs, because they do the same job but differ in structure and origin
(iii) vestigial organs, because they are not needed for life
(iv) connecting links, because they join birds and insects

c. Pasang touches a hot kettle and pulls his hand away before he even feels the pain. Why is this action so quick?

(i) The message goes to the cerebrum first, which thinks very fast.
(ii) The message is turned back by the spinal cord, without waiting for the brain.
(iii) Hormones from the adrenal gland move the hand.
(iv) The muscles of the hand feel the heat and move by themselves.

d. A bus leaving Banepa speeds up from 10 m/s to 25 m/s in 5 s. What is its acceleration?

(i) 3 m/s² (ii) 5 m/s² (iii) 7 m/s² (iv) 15 m/s²

e. Why is the steering wheel of a truck made much larger than the rod (axle) it turns?

(i) to make the truck move faster
(ii) to change the direction of the force
(iii) so that a small effort on the large wheel turns the axle with a large force
(iv) to make the machine's efficiency more than 100%

f. What is the SI unit of electric charge?

(i) ampere (ii) volt (iii) coulomb (iv) ohm

g. How high above the equator does a geostationary satellite go round the Earth?

(i) about 400 km (ii) about 20,200 km (iii) about 35,786 km (iv) about 384,000 km

h. A statement and two arguments are given below.

Statement: Sodium chloride has a high melting point.

Argument 1: It is made of sodium ions (Na^+) and chloride ions (Cl^-), held together by a strong electrostatic attraction.

Argument 2: Its sodium and chlorine atoms share a pair of electrons.

(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.

i. Why are electric wires made of copper?

(i) Copper is hard and brittle.
(ii) Copper is a good conductor of electricity and can be drawn into thin wires.
(iii) Copper does not let electricity pass through it.
(iv) Copper is a liquid metal.

j. Bimala tests a black solid X. It is soft and slippery and leaves a mark on paper, it lets a small bulb glow when connected in a circuit, and when it burns in plenty of oxygen the only product is carbon dioxide. What is X?

(i) diamond (ii) graphite (iii) charcoal (iv) sulfur

Section B

9 × 1 = 9

2. Write very short answers to the following questions.

a. Why should we take several readings of a measurement and find their average?

b. State Newton's first law of motion.

c. An FM radio station in Pokhara broadcasts at a frequency of 96 MHz. Calculate the wavelength of its radio waves. (Speed of radio waves = 3×10^8 m/s)

d. The heating element of an electric heater is made of nichrome. Why?

e. A dish antenna on the roof of Krishna's house in Lalitpur is pointed at a television satellite once and never needs to be turned again. Why?

f. Dawa gets an SMS: "Congratulations! You have won Rs 50,000. Send us the OTP that has just reached your phone to claim it." What should he do?

g. Write the name of the catalyst used to prepare oxygen from hydrogen peroxide in the laboratory.

h. Gold ornaments found in ancient tombs still shine, but iron tools buried at the same time are covered in rust. Give a reason.

i. Why does compost keep a field fertile for longer than chemical fertilizer alone?

Section C

14 × 2 = 28

Write short answers to the following questions.

3. A red blood cell is about 0.0000075 m across, and the Moon is about 384,000,000 m from the Earth. Write both lengths in scientific notation. **[2]**

4. Write any two characteristics of kingdom Fungi. **[2]**

5. Kopila picked some mushrooms in the forest after rain. She says, "They must be safe, because insects have eaten them. To be sure, I will cook them with a silver spoon: if the spoon doesn't turn black, we can eat them." Is she right? Give two reasons. **[2]**

6. How do fossils give evidence of organic evolution? Explain. **[2]**

7. The grass in the school ground is cut short every week, and every time it grows back from near the base of its stems. Which tissue makes this possible? Explain how. **[2]**

8. Write any two differences between distance and displacement. **[2]**

9. At the district sports meet, high jumpers land on a thick foam mattress, not on the hard ground. Analyze this using Newton's second law of motion. **[2]**

10. A ship's SONAR sends a pulse of ultrasound to the sea bed and receives its echo 2.4 s later. If sound travels at 1,500 m/s in sea water, how deep is the sea there? **[2]**

11. Write any two differences between an astronomical unit and a light-year. **[2]**

12. Write any two differences between an uplink and a downlink signal. **[2]**

13. Tenzing wants to pay his school fee through his bank's website. Write any two things he should check or do to be sure that he types his password into the real website. **[2]**

14. Write the molecular formula of calcium chloride by the criss-cross method, and calculate its molecular mass. (Ca = 40, Cl = 35.5) **[2]**

15. Sushila says, "Burning firewood is an endothermic reaction, because the wood needs a burning match before it starts to burn." Do you agree? Give a reason. **[2]**

16. A gas jar contains a colorless gas. A burning splint goes out in it, the gas itself does not burn, and it does not turn lime water milky. A burning magnesium ribbon keeps burning in it and leaves a yellowish powder. Identify the gas, and explain how the results show it. **[2]**

Section D

7 × 4 = 28

Write long answers to the following questions.

17. **[4]**

i. Write the name of the endocrine gland that secretes each of these hormones: insulin, thyroxine and adrenaline. (3)

ii. The pancreas is called a mixed gland. Why? (1)

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

> In the paddy fields of Sunsari, rice plants are eaten by rats and grasshoppers. Frogs eat the grasshoppers, snakes eat the frogs and the rats, and eagles eat the snakes. One year, the farmers killed most of the snakes in the fields because they were afraid of them.

i. Write a food chain of four links from the passage. (1)

ii. What will happen to the number of rats and to the rice harvest after the snakes are killed? Give a reason. (1)

iii. In the food chain rice plant → rat → snake → eagle, the eagle gets the least energy. Why? (1)

iv. Suggest one way the farmers can protect the rice without killing the snakes, and say why it is better. (1)

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

> Laxmi's family in Chitwan keeps four buffaloes. They cook on a firewood stove, and the kitchen is full of smoke. The family is thinking of building a biogas plant beside the cowshed.

i. Write any two advantages of a biogas plant over the firewood stove for this family. (2)

ii. What can the family do with the spent slurry that comes out of the plant? Why is that useful? (1)

iii. The digester of a biogas plant must be airtight. Why? (1)

20. **[4]**

i. Write two differences between a transverse wave and a longitudinal wave, with one example of each. (2)

ii. Light from the Sun reaches the Earth, but the sound of explosions on the Sun never does. Why? (1)

iii. Which electromagnetic waves does a TV remote control use? (1)

21. Prabin has two resistors of 4 Ω and 6 Ω and a 12 V battery. **[4]**

i. He connects them in series with the battery. Calculate the total resistance and the current in the circuit. (2)

ii. He then connects them in parallel with the battery. Calculate the total resistance and the current from the battery. (2)

22. i. Explain how magnesium (2, 8, 2) and oxygen (2, 6) form magnesium oxide by an electrovalent bond. (2) **[4]**

ii. Explain how a water molecule is formed by covalent bonds. (2)

23. Phulmaya grows maize on her farm in Kavre. She buys an NPK fertilizer whose 50 kg bag is marked 20-20-10. **[4]**

i. How much nitrogen is there in one bag? (1)

ii. The agriculture technician says her field needs 40 kg of nitrogen. How many bags of this fertilizer will give it? (1)

iii. In one corner of the field, the older, lower leaves of the maize plants have turned pale yellow. Which nutrient is lacking there? (1)

iv. In another corner, the edges of the older leaves have turned yellow, then brown and dry, as if scorched. Which nutrient is lacking there? (1)