The World of Metals and Non-metals

Standard difficulty · 20 questions · 40 marks · Time: 36 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. Metals can be beaten into thin sheets. This property is called:
(a) sonority **(b)** lustre **(c)** ductility **(d)** malleability

2. Which of these is a METAL?
(a) gold **(b)** glass **(c)** paper **(d)** plastic

3. Which of these is a NON-METAL?
(a) iron **(b)** gold **(c)** plastic **(d)** iodine

4. The use of metals for silver foil (varak) on sweets depends mainly on their:
(a) sonority **(b)** conduction of heat
(c) malleability **(d)** ductility

5. In which case will an iron nail RUST?
(a) under boiled, cooled water with oil on top
(b) painted all over and kept outdoors
(c) coated with zinc (galvanised)
(d) wrapped in a wet cloth

6. Which of these is NEITHER a metal nor a non-metal (not an element)?
(a) plastic **(b)** sodium **(c)** iodine **(d)** oxygen

7. 1 g of gold can be drawn into a wire about 2 km long. About how long a wire can 2 g make?
(a) 4 km **(b)** 8 km **(c)** 2 km **(d)** 40 km

8. The Iron Pillar of Delhi was made about the year 400. About how old will it be in 2084?
(a) 2,084 years **(b)** 1,784 years **(c)** 484 years **(d)** 1,684 years

Section B — Short answer — 8 × 2 = 16 marks

9. Name four properties of metals.

10. Write "metal", "non-metal" or "neither": (a) gold (b) phosphorus

11. Which property of metals is used in (a) cooking pans and kettles (b) polished copper vessels?

12. Is the oxide of each "acidic" or "basic" in water? (a) iron (b) sulfur

13. Will the nail rust? Write "yes" or "no": (a) painted all over and kept outdoors (b) left outside in the rain

14. A roll of aluminium foil weighs 230 g. Each sheet used weighs 23 g. How much foil is left after 9 sheets?

15. A steel rope for a crane is made of 52 thin wires twisted together, and the crane uses 6 such ropes. How many wires are there in all?

16. A nail kept with silica gel showed no rust after 12 days, and a nail half in water showed rust after 2 days. How many days earlier did rust appear on the nail in water?

Section C — Word problems — 4 × 4 = 16 marks

17. Describe an experiment to show that both air and water are needed for rusting.

18. Sort into metals, non-metals and neither: oxygen, gold, aluminium, hydrogen, paper, plastic. Why are the "neither" ones not counted as metals or non-metals?

19. Iron nails are kept: (1) coated with zinc (galvanised); (2) under boiled, cooled water with oil on top; (3) in dry air with silica gel. Which will rust, and why? What two things does rusting need?

20. Iron and phosphorus are burnt and their products dissolved in water. (a) Which turns red litmus blue, and which turns blue litmus red? (b) What does this tell us about metal and non-metal oxides? (c) Give one safety point for this demonstration.

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Answer key

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Q	Answer	Working
1	(d) malleability	—
2	(a) gold	—
3	(d) iodine	—
4	(c) malleability	—
5	(d) wrapped in a wet cloth	—
6	(a) plastic	—
7	(a) 4 km	2 × 2 = 4
8	(d) 1,684 years	2084 − 400 = 1684
9	They are lustrous, malleable, ductile, sonorous and good conductors of heat and electricity (any four).	—
10	(a) metal (b) non-metal	—
11	(a) conduction of heat (b) lustre	—
12	(a) basic (b) acidic	—
13	(a) no (b) yes	—
14	23 g	230 − 9 × 23
15	312 wires	52 × 6 = 312
16	10 days	12 − 2 = 10
17	Take three bottles with an iron nail each. A: with a drying agent like silica gel (dry air only). B: in boiled, cooled water with oil on top (water only, no air). C: partly in water, open (air and water). After 8–10 days, only the nail in C has rusted, so both air and water are needed.	—
18	Metals: gold, aluminium. Non-metals: oxygen, hydrogen. Neither: paper, plastic. They are not elements; they are made of many substances.	—
19	(1) does not rust; (2) does not rust; (3) does not rust. Rusting needs both air (oxygen) and water.	—
20	(a) Iron oxide turns red litmus blue (basic); phosphorus oxide turns blue litmus red (acidic). (b) Metal oxides are basic and non-metal oxides acidic. (c)	—

Q	Answer	Working
	Only a teacher should do it, with tongs, and never look straight at burning magnesium (or avoid breathing the gas).	