WS2_Unit 10 and Unit 11

1.

A common ore of lead is

A bauxite.
B carnallite.
C galena.
D rock salt.

2.

The main metallic compound in magnesite is

A magnesium carbonate.
B magnesium chloride.
C magnesium oxide.
D magnesium sulphate.

3.

Mercury is extracted from its ore by

A heating in air.
B heating with carbon.
C electrolysis.
D mechanical separation.

4.

Consider the following word equation:

$$\text{Mercury(II) sulphide + oxygen} \xrightarrow{\text{heat}} \text{X + Y}$$

Which of the following combinations is correct?

	X	Y
A	Mercury	sulphur
B	Mercury	sulphur dioxide
C	Mercury(II) oxide	sulphur
D	Mercury(II) oxide	sulphur dioxide

5.

Consider the following word equation:

$$\text{X + carbon} \xrightarrow{\text{heat}} \text{zinc + Y}$$

Which of the following combinations is correct?

	X	Y
A	Zinc oxide	sulphur dioxide
B	Zinc oxide	carbon dioxide
C	Zinc sulphide	sulphur dioxide
D	Zinc sulphide	carbon dioxide

6.

Which of the following combinations is INCORRECT?

	Metal	Method of extraction
A	Aluminium	Electrolysis of molten ore
B	Copper	Controlled heating in air
C	Iron	Heating with carbon
D	Silver	Heating with carbon

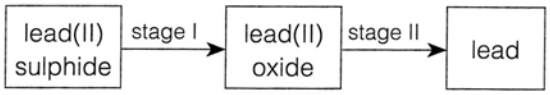
7.

Which of the following metal oxides CANNOT be reduced by heating with carbon?

A Copper(II) oxide
B Lead(II) oxide
C Magnesium oxide
D Zinc oxide

8.

The following flow diagram shows the main stages in the extraction of lead from galena, lead(II) sulphide.



Which of the following combinations is correct?

	Stage I	Stage II
A	Heating in air	Heating with carbon
B	Heating with carbon	Heating with carbon
C	Heating in air	Heating in air
D	Heating with carbon	Heating in air

9.

Which of the following metals exist as free elements in the Earth's crust?

(1) Gold
(2) Magnesium
(3) Silver

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

10.

Which of the following statements concerning aluminium are correct?

(1) It is the most abundant metal in the Earth's crust.
(2) It exists as a free element in the Earth's crust.
(3) It is used to make soft drink cans.

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

11.

Which of the following metals was NOT discovered in ancient times?

A Gold
B Lead
C Magnesium
D Mercury

12.

Which of the following metals can be extracted by physical methods?

(1) Copper
(2) Silver
(3) Sodium

A (1) only
B (2) only
C (1) and (3) only
D (2) and (3) only

13.

Which of the following metals are extracted by heating the ores alone?

(1) Copper
(2) Mercury
(3) Zinc

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

14.

Which of the following metals are extracted by reduction with carbon?

(1) Iron
(2) Lead
(3) Magnesium

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

15.

Which of the following metals are extracted by electrolysis of molten ores?

(1) Aluminium
(2) Potassium
(3) Sodium

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

16.

Which of the following statements concerning the extraction of iron are correct?

(1) It is carried out in a blast furnace.
(2) Limestone is produced in the process.
(3) Iron(III) oxide reacts with carbon monoxide to give iron.

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

17.

In which of the following processes would a metal be produced?

(1) Heating mercury(II) sulphide
(2) Heating iron(III) oxide
(3) Heating lead(II) oxide with carbon

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

18.

Which of the following are possible ways to conserve metals?

(1) Recycle metal cans
(2) Reuse metal articles
(3) Replace metals with other materials

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

19.

In an experiment, sodium is put into a trough of water. What are the products formed?

A Sodium hydroxide and hydrogen
B Sodium hydroxide and oxygen
C Sodium oxide and hydrogen
D Sodium oxide and oxygen

20.

Magnesium is heated in air. Which of the following combinations concerning the experiment is correct?

	Observation	Product
A	Bright light observed	Yellow powder
B	Bright light observed	White powder
C	Golden yellow flame observed	White powder
D	Golden yellow flame observed	Yellow powder

21.

In an experiment, a piece of calcium was added to a beaker of water. Which of the following statements concerning the experiment is INCORRECT?

A The calcium sank in water.
B The calcium burnt with a brick-red flame.
C The water became milky.
D An alkaline solution formed in the beaker.

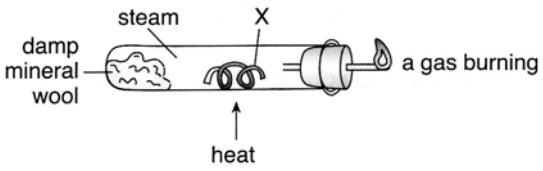
22.

In an experiment, steam is passed over aluminium. What are the products formed?

A Aluminium hydroxide and hydrogen
B Aluminium hydroxide and oxygen
C Aluminium oxide and hydrogen
D Aluminium oxide and oxygen

23.

Consider the following experiment.



During the experiment, a gas is produced. X is probably

A copper.
B gold.
C lead.
D magnesium.

24.

Which of the following sets of substances are formed when zinc reacts with dilute sulphuric acid?

A Zinc sulphate and hydrogen
B Zinc sulphate and sulphur dioxide
C Zinc sulphide and hydrogen
D Zinc sulphide and sulphur dioxide

25.

Dilute hydrochloric acid has NO reaction with

A calcium.
B copper.
C iron.
D zinc.

26.

Which of the following combinations is correct?

	Experiment	Salt produced
A	Copper + dilute sulphuric acid	Copper(II) sulphate
B	Iron + dilute sulphuric acid	Iron(II) sulphide
C	Lead + dilute hydrochloric acid	Lead hydrogen chloride
D	Magnesium + dilute hydrochloric acid	Magnesium chloride

27.

Which of the following processes will NOT produce hydrogen gas?

A Adding sodium to water
B Adding zinc to dilute hydrochloric acid
C Adding lead to water
D Adding iron to dilute sulphuric acid

28.

In which of the following experiments will a metal hydroxide be produced?

A Adding potassium to water
B Adding iron to dilute hydrochloric acid
C Heating calcium in air
D Passing steam over zinc

29.

In which of the following sets are the metals arranged in descending order of reactivity?

A Ca, Na, Zn, Pb, Al, Cu
B Zn, Cu, Ca, Al, Na, Pb
C Na, Al, Zn, Ca, Pb, Cu
D Na, Ca, Al, Zn, Pb, Cu

30.

The following table shows results of reactions of three metals (X, Y and Z).

Experiment	Metal		
	X	Y	Z
Heating in air	A powder formed	No observable change	A powder formed
Reaction with water	Bubbles given off	No observable change	No observable change

The reactivity series for the metals in order of increasing reactivity is

A X < Y < Z.
B X < Z < Y.
C Y < X < Z.
D Y < Z < X.

Directions: Questions 31-34 refer to the following table which shows the results of reactions of four metals (W, X, Y and Z) with cold water and dilute hydrochloric acid.

Experiment	Metal			
	W	X	Y	Z
Reaction with water	No reaction	No reaction	Reacts vigorously	No reaction
Reaction with dilute hydrochloric acid	No reaction	Reacts readily	Reacts explosively	Reacts very slowly

31.

The reactivity series for these metals in order of decreasing reactivity is

A W > Z > Y > X.
B X > W > Z > Y.
C Y > Z > W > X.
D Y > X > Z > W.

32.

W could be

A Ag.
B Ca.
C Fe.
D Pb.

33.

X could be

A Ca.
B Cu.
C Na.
D Zn.

34.

Y could be

A Al.
B Mg.
C K.
D Pt.

35.

Which of the following chemical equations best represents the reaction between zinc and steam?

A $Zn(s) + 2H_2O(l) \longrightarrow Zn(OH)_2(s) + H_2(g)$
B $Zn(s) + 2H_2O(g) \longrightarrow Zn(OH)_2(aq) + H_2(g)$
C $Zn(s) + H_2O(l) \longrightarrow ZnO(aq) + H_2(g)$
D $Zn(s) + H_2O(g) \longrightarrow ZnO(s) + H_2(g)$

36.

$pFe(s) + qH_2O(g) \longrightarrow rFe_3O_4(s) + sH_2(g)$

What are the values of p, q, r and s respectively in the above balanced equation?

	p	q	r	s
A	3	4	1	4
B	3	4	2	2
C	4	3	2	3
D	4	2	1	2

37.

Which of the following sets of state symbols is suitable for the following reaction?

$Mg + H_2O \longrightarrow MgO + H_2$

A (s), (l), (aq), (aq)
B (l), (aq), (l), (l)
C (s), (g), (s), (g)
D (l), (aq), (aq), (g)

38.

Which of the following chemical equations best represents the reaction between calcium and dilute hydrochloric acid?

A $Ca(s) + 2HCl(aq) \longrightarrow CaCl_2(s) + H_2(g)$
B $Ca(s) + 2HCl(aq) \longrightarrow CaCl_2(aq) + H_2(g)$
C $2Ca(s) + 2HCl(aq) \longrightarrow 2CaCl(aq) + H_2(g)$
D $2Ca(s) + 2HCl(aq) \longrightarrow 2CaCl(s) + H_2(g)$

39.

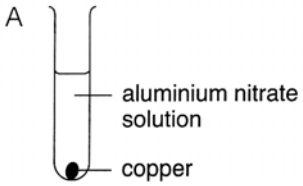
Which of the following chemical equations is NOT balanced?

A $4Al(s) + 3O_2(g) \longrightarrow 2Al_2O_3(s)$
B $3Fe(s) + 2O_2(g) \longrightarrow Fe_3O_4(s)$
C $Zn(s) + 2HCl(aq) \longrightarrow ZnCl_2(aq) + H_2(g)$
D $K(s) + 2H_2O(l) \longrightarrow KOH(aq) + H_2(g)$

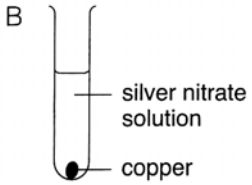
40.

In each of the following four solutions, a piece of copper is added. In which case will a reaction occur?

A



B



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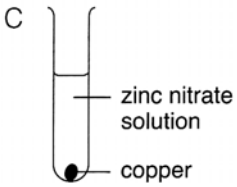
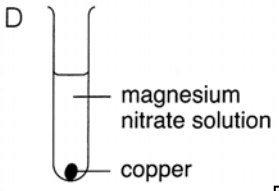


D



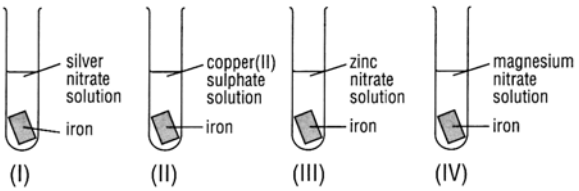
41.

Which of the following will occur when a zinc rod is put into a beaker of copper(II) sulphate solution?

	Colour change of the solution	Other observation
A	No change	The zinc rod dissolves
B	Blue to colourless	The zinc rod dissolves
C	Pale blue to blue	A brown layer is coated on the zinc rod
D	Blue to pale blue	A brown layer is coated on the zinc rod

42.

In each of the following four solutions, a strip of iron is added.



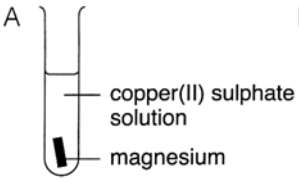
Which of the following combinations is correct?

	Tube	Observation
A	I	No change
B	II	Grey coating on iron
C	III	Reddish-brown coating on iron
D	IV	No change

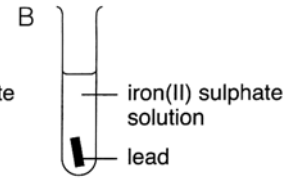
43.

Which of the following pairs of substances will react when mixed?

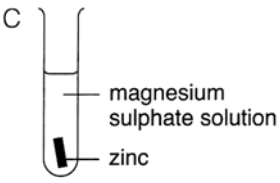
A



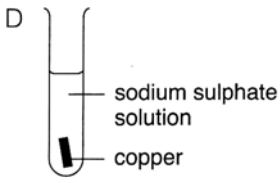
B



C



D



44.

Which of the following reactions will NOT produce hydrogen?

A Adding calcium to water
B Passing steam over lead
C Adding zinc to dilute hydrochloric acid
D Adding sodium to iron(II) sulphate solution

45.

Consider the results of displacement reactions of three metals, P, Q and R.

Metal	Solution of nitrate of		
	P	Q	R
P	—	x	x
Q	√	—	x
R	√	√	—

Key : √ = reaction takes place
x = no reaction

The descending order of reactivity of the metals is

A R > P > Q.
B P > Q > R.
C R > Q > P.
D Q > R > P.

46.

A student wants to test the difference in reactivity between the following pairs of metals. Which method could NOT be used for the given pair?

	Metal	Method suggested
A	Pt and Ca	Adding the metals to dilute hydrochloric acid
B	Cu and Mg	Passing steam over the hot metals
C	Al and Zn	Adding the metals to water
D	Ag and Fe	Adding the metals to copper(II) sulphate solution

47.

$$p\text{Mg(s)} + q\text{AgNO}_3\text{(aq)} \longrightarrow r\text{Mg(NO}_3\text{)}_2\text{(aq)} + s\text{Ag(s)}$$

What are the values of *p*, *q*, *r* and *s* respectively in the above balanced equation?

	p	*q*	*r*	*s*
A	1	2	1	2
B	2	1	2	2
C	1	3	3	1
D	3	2	1	3

48.

Which of the following ionic equations best represents the reaction between copper and silver nitrate solution?

A $\text{Cu(s)} + \text{Ag}^+\text{(aq)} \longrightarrow \text{Cu}^+\text{(aq)} + \text{Ag(s)}$
B $\text{Cu(s)} + 2\text{Ag}^+\text{(aq)} \longrightarrow \text{Cu}^{2+}\text{(aq)} + 2\text{Ag(s)}$
C $2\text{Cu(s)} + \text{Ag}^{2+}\text{(aq)} \longrightarrow 2\text{Cu}^+\text{(aq)} + \text{Ag(s)}$
D $\text{Cu(s)} + \text{Ag}^{2+}\text{(aq)} \longrightarrow \text{Cu}^{2+}\text{(aq)} + \text{Ag(s)}$

49.

Which of the following ionic equations represents a reaction that is likely to take place?

A $2\text{Al(s)} + 3\text{Mg}^{2+}\text{(aq)} \longrightarrow 2\text{Al}^{3+}\text{(aq)} + 3\text{Mg(s)}$
B $\text{Fe(s)} + \text{Zn}^{2+}\text{(aq)} \longrightarrow \text{Fe}^{2+}\text{(aq)} + \text{Zn(s)}$
C $\text{Cu(s)} + \text{Fe}^{2+}\text{(aq)} \longrightarrow \text{Cu}^{2+}\text{(aq)} + \text{Fe(s)}$
D $\text{Zn(s)} + 2\text{Ag}^+\text{(aq)} \longrightarrow \text{Zn}^{2+}\text{(aq)} + 2\text{Ag(s)}$

50.

A metal X is more reactive than magnesium. X can probably be extracted by

A heating its oxide with carbon.
B passing electricity through its molten ore.
C passing electricity through an aqueous solution of its compound.
D Heating its sulphide in the air.

51.

X, Y and Z are three metals. Only Y is found as a free element in the Earth's crust. Carbon can remove oxygen from the oxide of X but not from that of Z. The reactivity series of these metals in decreasing reactivity is

A Z > X > Y.
B Y > Z > X.
C X > Z > Y.
D Y > X > Z.

52.

The following table shows some information of four metals, W, X, Y and Z.

Metal	Year of discovery	Extraction method
W	1746	Carbon reduction
X	Ancient	Mechanical separation
Y	Ancient	Carbon reduction
Z	1826	Electrolysis of molten ore

Which of the metals is the most reactive?

A W
B X
C Y
D Z

53.

The results of two experiments of three metals, X, Y and Z, are shown in the following table.

Experiment	Metal		
	X	Y	Z
Action of metal on zinc sulphate solution	No observable change	A gas is given off	No observable change
Action of heat on the metal oxide	Metal X is formed	No observable change	No observable change

Which of the following arrangements represents the order of increasing reactivity of the three metals?

A X < Z < Y
B Y < X < Z
C Y < Z < X
D Z < X < Y

54.

Which of the following factors are usually considered when comparing the reactivity of metals?

(1) The rate of their reactions
(2) The temperature at which their reactions start
(3) The amount of heat energy given out during their reactions

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

55.

In an experiment, calcium is heated in air. Which of the following statements concerning the experiment are correct?

(1) Calcium burns with a brick-red flame.
(2) A white powder is formed.
(3) The product is calcium oxide.

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

56.

A metal gives a white powder when burnt in air. The metal could be

(1) aluminium.
(2) iron.
(3) mercury.

A (1) only
B (2) only
C (1) and (3) only
D (2) and (3) only

57.

A metal X forms a black oxide when burnt in air. X shows no reaction with dilute sulphuric acid. X could be

(1) copper.
(2) iron.
(3) lead.

A (1) only
B (2) only
C (1) and (3) only
D (2) and (3) only

58.

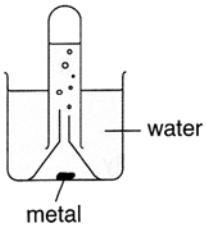
In an experiment, a piece of sodium was added to a trough of water. Which of the following statements concerning the experiment are correct?

(1) The metal moved rapidly on the water surface.
(2) The metal burnt with a golden yellow flame.
(3) An alkaline solution formed in the trough.

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

59.

In an experiment using the following set-up, a gas is given off.



The metal could be

(1) silver.
(2) calcium.
(3) sodium.

A (1) only
B (2) only
C (1) and (3) only
D (2) and (3) only

60.

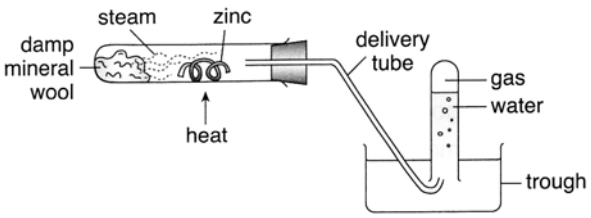
Which of the following experiments will produce an oxide?

(1) Adding calcium to water
(2) Heating magnesium in air
(3) Passing steam over aluminium

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

61.

Consider the following experiment.



Which of the following statements concerning the gas collected in the test tube are correct?

(1) The gas is colourless.
(2) The gas can turn cobalt(II) chloride paper from pink to blue.
(3) The gas gives a 'pop' sound with a burning splint.

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

62.

Which of the following metals show LITTLE reaction with water but react readily with steam?

(1) Iron
(2) Magnesium
(3) Zinc

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

63.

In which of the following experiments will a gas be produced?

(1) Adding lead to water
(2) Adding iron to dilute sulphuric acid
(3) Adding copper to dilute hydrochloric acid

A (1) only
B (2) only
C (1) and (3) only
D (2) and (3) only

64.

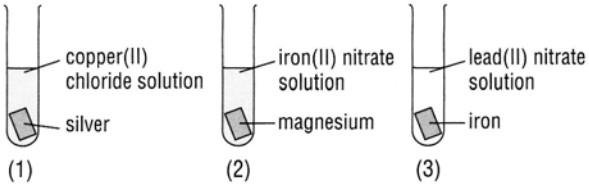
Dilute sulphuric acid has NO reaction with

(1) gold.
(2) magnesium.
(3) silver.

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

65.

Consider the following reactions:



In which of the above cases will reaction take place?

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

66.

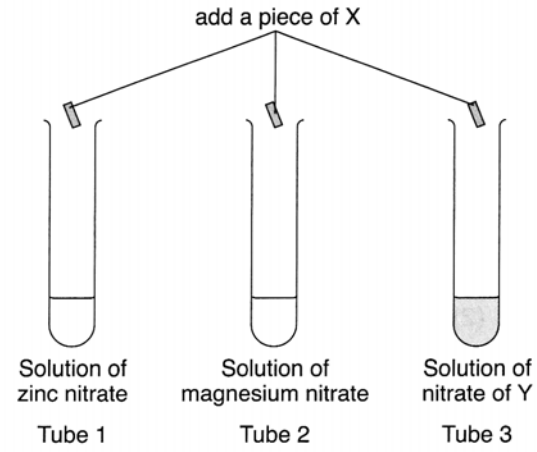
Metal X is slightly more reactive than iron. Which of the following statements concerning X is/are probably correct?

(1) X remains shiny after exposed to air.
(2) X reacts readily with dilute hydrochloric acid.
(3) X can be extracted from its oxide by carbon reduction at the temperature of Bunsen flame.

A (1) only
B (2) only
C (1) and (3) only
D (2) and (3) only

67.

Consider the following reactions of four metals, Zn, Mg, X and Y.



The results are:

Tube 1	Tube 2	Tube 3
Grey coating on X	No observable change	Mud-like deposit on X

Based on the experimental results, which of the following deductions are correct?

(1) Magnesium is more reactive than X.
(2) X is more reactive than Y.
(3) Y is more reactive than zinc.

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)

68.

Zinc oxide can be obtained from which of the following processes?

(1) Heating zinc in air
(2) Passing steam over zinc
(3) Heating zinc sulphide in air

A (1) and (2) only
B (1) and (3) only
C (2) and (3) only
D (1), (2) and (3)