

Part B-1
Answer all questions in this part.

Directions (25-31): For each statement or question, record on your separate answer sheet the number of the word or expression that, of those given, best completes the statement or answers the question. Some questions may require the use of the 2011 Edition Reference Tables for Physical Setting/Chemistry.

- 25 The electrical conductivity of $\text{KI}_{(aq)}$ is greater than the electrical conductivity of $\text{H}_2\text{O}_{(l)}$ because the $\text{KI}_{(aq)}$ contains mobile
- (1) molecules of H_2O
(2) ions from H_2O
(3) molecules of KI
(4) ions from KI
- 26 Which substance has a high melting point and conducts electricity in the liquid phase but not in the solid phase?
- (1) Ne (3) NaCl
(2) Hg (4) CO
- 27 Which compound in the solid state has a high melting point and conducts electricity only after it has been liquified?
- (1) carbon dioxide (3) hydrogen chloride
(2) silicon dioxide (4) potassium chloride
- 28 Which molecule is a dipole?
- (1) $\begin{array}{c} \text{H}-\text{S} \\ | \\ \text{H} \end{array}$ (3) $\text{O}=\text{C}=\text{O}$
- (2) $\begin{array}{c} \text{H} \\ | \\ \text{H}-\text{C}-\text{H} \\ | \\ \text{H} \end{array}$ (4) $\text{N}\equiv\text{N}$
- 29 Hydrogen bonding is strongest between molecules of
- (1) H_2S (3) H_2Se
(2) H_2O (4) H_2Te
- 30 Which formula represents a nonpolar molecule containing polar covalent bonds?
- $\text{H}-\text{H}$ $\text{O}=\text{C}=\text{O}$ $\begin{array}{c} \text{N} \\ / \quad \backslash \\ \text{H} \quad \text{H} \quad \text{H} \end{array}$ $\begin{array}{c} \text{O} \\ / \quad \backslash \\ \text{H} \quad \text{H} \end{array}$
- (1) (2) (3) (4)
- 31 Which atom has the *least* attraction for the electrons in a bond between that atom and an atom of hydrogen?
- (1) carbon (3) oxygen
(2) nitrogen (4) fluorine

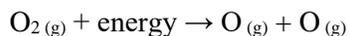
Part B–2**Answer all questions in this part.**

Directions (32-39): Record your answers in the spaces provided in your answer booklet. Some questions may require the use of the *2011 Edition Reference Tables for Physical Setting/Chemistry*.

- 32 Explain, in terms of electron configuration, why arsenic and antimony are chemically similar. [1]
33 Explain, in terms of electrons, the change in radius when a sodium atom becomes a sodium ion. [1]
-

Base your answer to question 34 through 36 on the information below and on your knowledge of chemistry.

The balanced equation below represents a reaction.



- 34 Identify the type of chemical bond in a molecule of the reactant. [1]
35 In the space *in your answer booklet*, draw a Lewis electron-dot diagram of one oxygen atom. [1]
36 Explain, in terms of bonds, why energy is absorbed during this reaction. [1]
-

- 37 Based on Table *E*, identify the polyatomic ion in the solid product of the following reaction. [1]



Base your answer to question 38 on the information below and on your knowledge of chemistry.

Nitrogen dioxide, NO_2 , is a dark brown gas that is used to make nitric acid and to bleach flour. Nitrogen dioxide has a boiling point of 294 K at 101.3 kPa.

- 38 At standard pressure, compare the strength of intermolecular forces in $\text{NO}_2(\text{g})$ to the strength of intermolecular forces in $\text{N}_2(\text{g})$. [1]
39 In your answer book, write the IUPAC name for $\text{N}_2\text{O}_4(\text{g})$. [1]
-

Part C
Answer all questions in this part.

Directions (40-44): Record your answers in the spaces provided in your answer booklet. Some questions may require the use of the *2011 Edition Reference Tables for Physical Setting/Chemistry*.

Base your answer to questions 40 and 41 on the information below and on your knowledge of chemistry.

Baking soda, NaHCO_3 , can be commercially produced during a series of chemical reactions called the Solvay process. In this process, NH_3 (aq), NaCl (aq), and other chemicals are used to produce NaHCO_3 (s) and NH_4Cl (aq).

To reduce production costs, NH_3 (aq) is recovered from NaCl (aq) through a different series of reactions. This series of reactions can be summarized by the overall reaction represented by the unbalanced equation below.

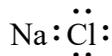


- 40 Write a chemical name for baking soda. [1]
- 41 Determine the mass of NH_4Cl that must be dissolved in 100. grams of H_2O to produce a saturated solution at 70°C . [1]

Base your answer to question 41 on the information below and on your knowledge of chemistry.

A student made a copper bracelet by hammering a small copper bar into the desired shape. The bracelet has a mass of 30.1 grams and was at a temperature of 21°C in the classroom but reached a temperature of 33° as the student wore it. The specific heat capacity of copper is $0.385 \text{ J/g}\cdot\text{K}$.

- 42 Show a numerical setup for calculating the amount of heat absorbed by the bracelet when the student wore the bracelet on her arm. [1]
- 43 An atom has an atomic number of 9, a mass number of 19, and an electron configuration of 2-6-1. What is the total number of neutrons in the described atom? [1]
- 44 A student drew the Lewis electron-dot diagram below to represent sodium chloride.



Explain why this diagram is not an accurate representation for the bonding in NaCl . [1]

The University of the State of New York
REGENTS HIGH SCHOOL EXAMINATION

PHYSICAL SETTING CHEMISTRY

Wednesday, January 23, 2019 — 10:00 a.m. to 11:30 a.m., only

ANSWER BOOKLET

Student.....

Teacher.....

School Grade

Record your answers for Part B–2 and Part C in this booklet.

32 _____

33 _____

34 _____

35 LED for one oxygen atom



36 _____

37 _____

38 _____

39 _____

40 _____

41 _____ g

42 Show a numerical setup.

43 _____ neutrons

44 _____
