



Entry Test

Academic Session 2019-20

CHEMISTRY

Total
Marks

40

45 min

Class: IG-II(IX)

Write in block letters:

Candidate Name

Date

Kindly read the instructions carefully;

- 1 Answers must be written in ink.
- 2 Write the number of question distinctly before each answer.

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Total Marks		Marks Obtained		Percentage	

Section A – Multiple Choice Questions (MCQs)

1 Four physical changes are listed.

- 1 condensation
- 2 evaporation
- 3 freezing
- 4 sublimation

In which changes do the particles move further apart?

- A** 1 and 2 **B** 1 and 3 **C** 2 and 4 **D** 3 and 4

2 What is the nucleon number of an atom?

- A** the number of electrons, neutrons and protons in the nucleus
B the number of neutrons and protons in the nucleus
C the number of neutrons in the nucleus
D the number of protons in the nucleus

3 Caesium, Cs, is an element in Group I of the Periodic Table.

When caesium reacts it forms a positive ion, Cs⁺.

How is a caesium ion formed?

- A** A caesium atom gains a proton.
B A caesium atom gains an electron.
C A caesium atom loses an electron.
D A caesium atom shares an electron.

4 Which statement about graphite and diamond is correct?

- A** Diamond has a high melting point but graphite does not.
B Graphite and diamond both conduct electricity.
C Graphite and diamond both have giant structures.
D Graphite is ionic and diamond is covalent.

5 Which molecule contains exactly two single covalent bonds?

- A** Cl₂ **B** CH₄ **C** H₂O **D** HCl

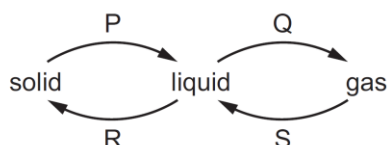
6 Which part of an atom has a relative mass of 1 and a relative charge of 0?

- A** electron
B neutron
C nucleus
D proton

7 What is the definition of relative atomic mass, A_r ?

- A** $\left(\frac{\text{average mass of naturally occurring atoms of an element}}{\text{mass of one atom of } ^{12}\text{C}} \right) \times 12$
- B** $\left(\frac{\text{average mass of naturally occurring atoms of an element}}{\text{mass of one atom of } ^{12}\text{C} \times 12} \right)$
- C** $\left(\frac{\text{average mass of naturally occurring atoms of an element}}{\text{mass of one atom of } ^{12}\text{C}} \right)$
- D** $\left(\frac{\text{mass of one atom of } ^{12}\text{C}}{\text{average mass of naturally occurring atoms of an element}} \right)$

8 The diagram shows some changes of state.



Which words describe the changes of state, P, Q, R and S?

	P	Q	R	S
A	freezing	boiling	melting	evaporation
B	melting	evaporation	freezing	condensation
C	melting	sublimation	freezing	evaporation
D	sublimation	evaporation	melting	condensation

9 Sodium reacts with chlorine to form sodium chloride.

Which statements describe what happens to the sodium atoms in this reaction?

- 1 Sodium atoms form positive ions.
- 2 Sodium atoms form negative ions.
- 3 Sodium atoms gain electrons.
- 4 Sodium atoms lose electrons.

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

10 What is the relative formula mass of ammonium nitrate, NH_4NO_3 ?

A 80 **B** 108 **C** 122 **D** 150

11 Four statements about the arrangement of particles are given.

- 1 Particles are packed in a regular arrangement.
- 2 Particles are randomly arranged.
- 3 Particles move over each other.
- 4 Particles vibrate about fixed points.

Which statements describe the particles in a solid?

- A** 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4
- 12 Q and R are elements in the same period of the Periodic Table.

Q has 7 electrons in its outer shell and R has 2 electrons in its outer shell.

Which statement about Q and R is correct?

- A** Q is a metal and R is a non-metal.
- B** Q and R have different numbers of electron shells.
- C** R is found to the right of Q in the Periodic Table.
- D** The proton number of R is less than the proton number of Q.
- 13 Which electron arrangement for the outer shell electrons in a covalent compound is correct?



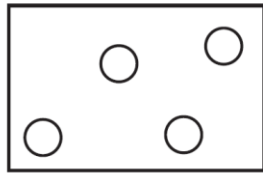
14 Which element does **not** form a stable ion with the same electronic structure as argon?

- A** aluminium
- B** chlorine
- C** phosphorus
- D** potassium
- 15 Graphite and diamond are both forms of the element carbon.

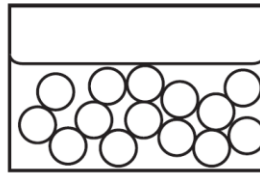
Which row shows the number of other carbon atoms that each carbon atom is covalently bonded to in graphite and diamond?

	graphite	diamond
A	3	3
B	3	4
C	4	3
D	4	4

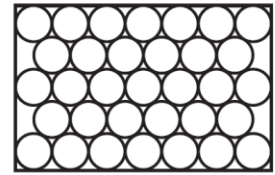
- 16 Diagrams R, S and T represent the three states of matter.



R



S

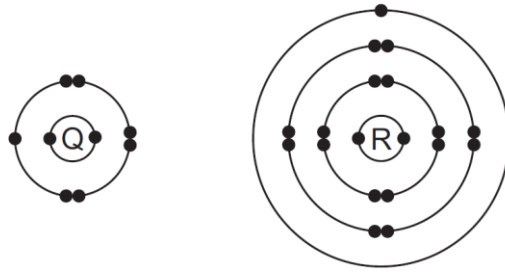


T

Which change occurs during freezing?

- A** R → S **B** S → T **C** T → R **D** T → S
- 17 A student needs to measure 22 cm^3 of water at 40°C .
Which apparatus is required?
- A** beaker and stopwatch
B beaker and thermometer
C measuring cylinder and stopwatch
D measuring cylinder and thermometer
- 18 Which method is used to obtain a concentrated solution of ethanol from a dilute solution of ethanol dissolved in water?
- A** crystallisation
B distillation
C filtration
D paper chromatography
- 19 Which definition of isotopes is correct?
- A** atoms of the same element that have the same number of electrons and nucleons
B atoms of the same element that have the same number of neutrons and protons
C atoms of the same element that have the same number of protons but a different number of electrons
D atoms of the same element that have the same number of protons but a different number of nucleons

20 The electronic structures of atoms Q and R are shown.



Q and R form an ionic compound.

What is the formula of the compound?

A QR_7

B Q_2R_4

C QR

D Q_7R

Section B –Structure Questions

1 This question is about subatomic particles.

(a) Define the terms

proton number,

.....

nucleon number.

.....

[3]

(b) Why is the ${}^1_1\text{H}$ hydrogen atom the **only** atom to have an identical proton number and nucleon number?

.....

..... [1]

(c) Complete the table to show the number of protons, neutrons and electrons in the atoms and ions given.

	number of protons	number of neutrons	number of electrons
${}^{19}\text{F}$			9
${}^{26}\text{Mg}$	12		
${}^{31}\text{P}^{3-}$			
${}^{87}\text{Sr}^{2+}$			

[6]

(d) (i) Write the formula of the compound formed from fluorine and magnesium.

..... [1]

(ii) Write the formula of the compound formed from Sr^{2+} and P^{3-} .

..... [1]

[Total: 12]

2 (a) State the name of the process that is used to

(i) separate oxygen from liquid air,

..... [1]

(ii) separate the individual dyes in ink,

..... [1]

(iii) produce ethanol from simple sugars,

..... [1]

(iv) obtain water from aqueous sodium chloride,

..... [1]

(v) separate the precipitate formed when aqueous silver nitrate is added to aqueous sodium chloride.

..... [1]

(b) State what is meant by the terms

(i) *element*,

.....
..... [1]

(ii) *compound*,

.....
..... [1]

(iii) *ion*.

.....
..... [1]

[Total: 8]

The Periodic Table of Elements

		Group															
I	II	III	IV	V	VI	VII	VIII										
3 Li lithium 7	4 Be beryllium 9	1 H hydrogen 1	5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	2 He helium 4									
11 Na sodium 23	12 Mg magnesium 24	Key atomic number atomic symbol name relative atomic mass															
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium —	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium —	85 At astatine —	86 Rn radon —
87 Fr francium —	88 Ra radium —	89–103 actinoids	104 Rf rutherfordium —	105 Db dubnium —	106 Sg seaborgium —	107 Bh bohrium —	108 Hs hassium —	109 Mt meitnerium —	110 Ds darmstadtium —	111 Rg roentgenium —	112 Cn copernicium —	114 Fl flerovium —	116 Lv livermorium —	—	—	—	—

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium —	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
actinoids	89 Ac actinium —	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium —	94 Pu plutonium —	95 Am americium —	96 Cm curium —	97 Bk berkelium —	98 Cf californium —	99 Es einsteinium —	100 Fm fermium —	101 Md mendelevium —	102 No nobelium —	103 Lr lawrencium —

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).