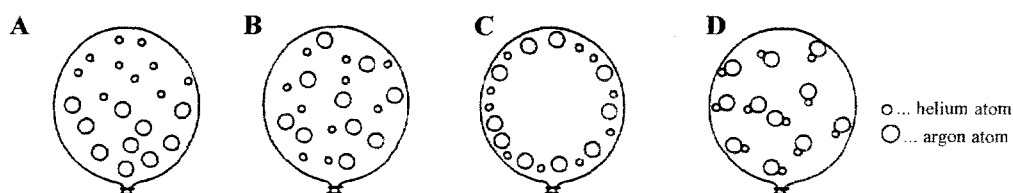


Answer **all** questions on the OMR sheet provided.

21. Which diagram shows the arrangement of particles inside a balloon filled with a mixture of helium and argon?



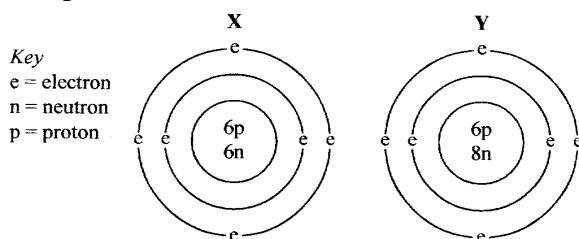
22. Nitrogen gas is obtained industrially by

- A. evaporation
- B. fractional Distillation
- C. simple Distillation
- D. boiling

23. A pure compound X has a melting point  $905^{\circ}\text{C}$  and is soluble in water. Which one of the following is X likely to be?

- A. calcium carbonate
- B. ethanol
- C. poly(ethene)
- D. sodium chloride

24. Two particles X and Y have the structures shown.



Which term describes X and Y?

- A. Allotropes
- B. Ions
- C. Isomers
- D. Isotopes

25. Which one of the following is a pure compound?

- A. air
- B. carbon
- C. oxygen
- D. steam

26. How many elements are there in ammonia gas?
- A. one
  - B. two
  - C. three
  - D. four
27. Which compound reacts with carbon dioxide to form a neutral salt?
- A. calcium chloride
  - B. calcium hydroxide
  - C. calcium nitrate
  - D. calcium sulphate
28. Which of the following substances is used to neutralize acidity in soil?
- A. ammonium nitrate
  - B. calcium hydroxide
  - C. magnesium sulphate
  - D. potassium chloride
29. Lead(II) sulphate is insoluble in water. What should be added to dilute sulphuric acid to prepare lead(II) sulphate?
- A. powdered lead(II) carbonate
  - B. powdered lead(II) chloride
  - C. aqueous lead(II) nitrate
  - D. powdered lead(II) oxide
30. The oxide of a metal was found to react **both** with hydrochloric acid and with sodium hydroxide solution. Which one of the following is the best description of the oxide?
- A. acidic
  - B. alkaline
  - C. amphoteric
  - D. neutral
31. Which one of these chemicals is a common reducing agent?
- A. Acidified potassium dichromate(VI) solution
  - B. Chlorine gas
  - C. Iron (III) chloride solution
  - D. Potassium iodide solution
32. A liquid is thought to be pure ethanoic acid. What is the best way to test its purity?
- A. Burn it completely in oxygen
  - B. Measure its boiling point
  - C. React it with calcium carbonate
  - D. React it with ethanol

33. The simplest ratio of atoms, in a compound of relative molecular mass 60, is  $\text{CH}_2\text{O}$ .  
What is the molecular formula of the compound?
- A.  $\text{C}_4\text{H}_4\text{O}_4$
  - B.  $\text{C}_4\text{H}_4\text{O}_2$
  - C.  $\text{C}_2\text{H}_4\text{O}_4$
  - D.  $\text{C}_2\text{H}_4\text{O}_2$
34. Which set of conditions will make marble (calcium carbonate) react most quickly with hydrochloric acid?
- A. marble chips and dilute acid at  $20^\circ\text{C}$
  - B. marble chips and dilute acid at  $40^\circ\text{C}$
  - C. marble powder and dilute acid at  $20^\circ\text{C}$
  - D. marble powder and dilute acid at  $40^\circ\text{C}$
35. Three equations are given.  
equation 1:  $\text{H}_2 \rightarrow 2\text{H}$   
equation 2:  $2\text{H} + \text{O} \rightarrow \text{H}_2\text{O}$   
equation 3:  $\text{HCl} \rightarrow \text{H} + \text{Cl}$
- Which equations represent endothermic processes?
- A. 3 only
  - B. 1 and 2
  - C. 1 and 3
  - D. 2 and 3
36. Brass is an alloy of
- A. copper and lead.
  - B. copper and zinc.
  - C. lead and tin.
  - D. tin and zinc.
37. What is the formula of the compound removed from seawater by desalination?
- A.  $\text{NaCl}$
  - B.  $\text{NaOH}$
  - C.  $\text{SiO}_2$
  - D.  $\text{SO}_2$
38. Which of the following describes the changes in properties of the alkanes as the number of carbon atoms in the homologous series increases?
- |   | <u>flammability</u> | <u>viscosity</u> |
|---|---------------------|------------------|
| A | decrease            | decrease         |
| B | decrease            | increase         |
| C | increase            | increase         |
| D | increase            | decrease         |

39. Which object is non-biodegradable?

- A. A hamburger
- B. A paper cup
- C. A piece of wood
- D. A plastic bottle

40. What is the formula of the ester formed when ethanoic acid reacts with propanol ( $\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$ )?

- A.
- $$\begin{array}{ccccccc} & \text{H} & \text{O} & & \text{H} & \text{H} & \\ & | & || & & | & | & \\ \text{H} & - \text{C} & - \text{C} & - \text{O} & - \text{C} & - \text{C} & - \text{H} \\ & | & & & | & | & \\ & \text{H} & & & \text{H} & \text{H} & \end{array}$$
- B.
- $$\begin{array}{ccccccc} & \text{H} & \text{O} & & \text{H} & & \\ & | & || & & | & & \\ \text{H} & - \text{C} & - \text{C} & - \text{O} & - \text{O} & - \text{C} & - \text{H} \\ & | & & & & | & \\ & \text{H} & & & & \text{H} & \end{array}$$
- C.
- $$\begin{array}{ccccccc} & \text{H} & \text{H} & \text{O} & & \text{H} & \text{H} \\ & | & | & || & & | & | \\ \text{H} & - \text{C} & - \text{C} & - \text{C} & - \text{O} & - \text{C} & - \text{C} & - \text{H} \\ & | & | & & & | & | \\ & \text{H} & \text{H} & & & \text{H} & \text{H} & \end{array}$$
- D.
- $$\begin{array}{ccccccc} & \text{H} & \text{O} & & \text{H} & \text{H} & \text{H} \\ & | & || & & | & | & | \\ \text{H} & - \text{C} & - \text{C} & - \text{O} & - \text{C} & - \text{C} & - \text{C} & - \text{H} \\ & | & & & | & | & | \\ & \text{H} & & & \text{H} & \text{H} & \text{H} & \end{array}$$

# The Periodic Table of the Elements

I		II		Group										III	IV	V	VI	VII	0																																		
																				4	5	6	7	8	9	10	11	12	13	14	15	16	17	18																			
7 Li Lithium 3	9 Be Beryllium 4	23 Na Sodium 11	24 Mg Magnesium 12	39 K Potassium 19	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 27	64 Cu Copper 29	65 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34																80 Br Bromine 35	84 Kr Krypton 36	115 In Indium 49	112 Cd Cadmium 48	108 Ag Silver 47	106 Pd Palladium 47	103 Rh Rhodium 45	101 Ru Ruthenium 44	101 Rh Rhodium 45	106 Pd Palladium 47	112 Cd Cadmium 48	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83
85 Rb Rubidium 37	88 Sr Strontium 38	133 Cs Caesium 55	137 Ba Barium 56	89 Y Yttrium 39	90 Zr Zirconium 40	91 Nb Niobium 41	92 Mo Molybdenum 42	96 Tc Technetium 43	101 Ru Ruthenium 44	101 Rh Rhodium 45	106 Pd Palladium 47	108 Ag Silver 47	112 Cd Cadmium 48	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54	210 Po Polonium 84	210 At Astatine 85	210 Rn Radon 86	210 Fr Francium 87	226 Ra Radium 88	227 Ac Actinium 89	227 La Lanthanum 57	227 Ce Cerium 58	227 Pr Praseodymium 59	227 Nd Neodymium 60	227 Pm Promethium 61	227 Sm Samarium 62	227 Eu Europium 63	227 Gd Gadolinium 64	227 Tb Terbium 65	227 Dy Dysprosium 66	227 Ho Holmium 67	227 Er Erbium 68	227 Tm Thulium 69	227 Yb Ytterbium 70	227 Lu Lutetium 71	227 Th Thorium 90	227 Pa Protactinium 91	227 U Uranium 92	227 Np Neptunium 93	227 Pu Plutonium 94	227 Am Americium 95	227 Cm Curium 96	227 Bk Berkelium 97	227 Cf Californium 98	227 Es Einsteinium 99	227 Fm Fermium 100	227 Md Mendelevium 101	227 No Nobelium 102	227 Lr Lawrencium 103

\* 58 - 71 Lanthanoid series  
+ 90 - 103 Actinoid series

a	X
b	+

Key  
 a = relative atomic mass  
 X = atomic symbol  
 b = proton (atomic) number

The volume of one mole of any gas is 24 dm<sup>3</sup> at room temperature and pressure (r.t.p.)