education

Department of
Education
FREE STATE PROVINCE

GRADE 7

NATURAL SCIENCES CONTROLLED TEST

JUNE 2025

TIME: 2 HOURS

MARKS: 60

GENERAL INSTRUCTIONS AND INFORMATION:

1. The question paper consists of 10 pages including the cover page.
2. There are 5 questions in total.
3. Allocation of marks:
   SECTION A: 15
   SECTION B: 45
4. Read and answer all the questions thoroughly.
5. Answer **ALL** the questions on a **separate answer book provided.**
6. Leave one line between two sub – sections, and questions.
7. Write neatly and legibly.

SECTION A

QUESTION 1

1.1 Choose the correct answer from the possible answers given in each statement. Write down only the correct letter next to the relevant number, e.g., 1.1.1 E.

1.1.1 Which method is best for separating sand and water? **(1)**

A. Filtration
B. Evaporation
C. Distillation
D. Chromatography

1.1.2 A substance that turns red litmus paper blue is: **(1)**

A. An acid
B. A base
C. A neutral substance
D. Thermometer

1.1.3 Which of the following materials is a good conductor of electricity? **(1)**

A. Plastic
B. Wood
C. Copper
D. Rubber

1.1.4 The Periodic Table arranges elements in order of….. **(1)**

A. Metals
B. Non- metals
C. Semi- metals
D. All of the above

1.1.5 Which separation technique is used to separate a mixture of iron filings and sulphur powder? **(1)**

A. Filtration

B. Magnetism

C. Evaporation

D. Distillation

[5]

1.2 Choose a term from Column B that matches the description in Column A. Write **ONLY** the letter next to the question number 1.2.1. – 1.2.5, e.g., 1.2.1 H. **[5]**

	Column A	**Column B**
1.2.1	A substance that cannot be broken down further, into simpler substances.	A. Filtration
1.2.2	A process to separate solids from liquids.	B. Acid
1.2.3	A substance that tastes sour, changes blue litmus paper to red.	C. Neutral substance
1.2.4	The ability of a material to allow electricity to move through it	D. Element
1.2.5	The liquid in a solution in which the solute dissolves.	E. Electrical conductivity
		F. Solvent

1.3 Give ONE word/term for each of the following descriptions. Write only the correct word/phrase next to the question number (1.3.1 – 1.3.5) in your ANSWER BOOK.

1.3.1 The process used to separate a soluble substance from a solution by heating. (1)

1.3.2 A liquid that dissolves a solute to form a solution. (1)

1.3.3 Elements that are mostly solid at room temperature. (1)

1.3.4 Substances that eat through clothing and burn the skin (1)

1.3.5 Materials that prevent heat from flowing through them. (1)

[5]

SECTION A TOTAL: [15]

SECTION B:

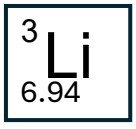
QUESTION 2

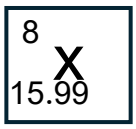
Study the two elements given below. Refer to the periodic table provided

1												13	14	15	16	17	18
1 H 1.00794	2																2 He 4.002602
3 Li 6.941	4 Be 9.012182											5 B 10.811	6 C 12.0107	7 N 14.00674	8 O 15.9994	9 F 18.9984032	10 Ne 20.1797
11 Na 22.989770	12 Mg 24.3050	3	4	5	6	7	8	9	10	11	12	13 Al 26.581538	14 Si 28.0855	15 P 30.973761	16 S 32.066	17 Cl 35.4527	18 Ar 39.948
19 K 39.0983	20 Ca 40.078	21 Sc 44.955910	22 Ti 47.867	23 V 50.9415	24 Cr 51.9961	25 Mn 54.938049	26 Fe 55.845	27 Co 58.933200	28 Ni 58.6534	29 Cu 63.545	30 Zn 65.39	31 Ga 69.723	32 Ge 72.61	33 As 74.92160	34 Se 78.96	35 Br 79.504	36 Kr 83.80
37 Rb 85.4678	38 Sr 87.62	39 Y 88.90585	40 Zr 91.224	41 Nb 92.90638	42 Mo 95.94	43 Tc (98)	44 Ru 101.07	45 Rh 102.90550	46 Pd 106.42	47 Ag 196.56655	48 Cd 112.411	49 In 114.818	50 Sn 118.710	51 Sb 121.760	52 Te 127.60	53 I 126.90447	54 Xe 131.29
55 Cs 132.90545	56 Ba 137.327	71 Lu 174.967	72 Hf 178.49	73 Ta 180.94.79	74 W 183.84	75 Re 186.207	76 Os 190.23	77 Ir 192.217	78 Pt 195.078	79 Au 196.56655	80 Hg 200.59	81 Tl 204.3833	82 Pb 207.2	83 Bi 208.58038	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra (226)	103 Lr (262)	104 Rf (261)	105 Db (262)	106 Sg (263)	107 Bh (262)	108 Hs (265)	109 Mt (266)	110 Ds (269)	111 Rg (272)	112 Cn (277)	113 Uut (277)	114 Uuq (277)	115 Uup (277)	116 Uuh (277)		118 Uuo (277)

57 La 138.9055	58 Ce 140.116	59 Pr 140.50765	60 Nd 144.24	61 Pm (145)	62 Sm 150.36	63 Eu 151.964	64 Gd 157.25	65 Tb 158.92534	66 Dy 162.50	67 Ho 164.93032	68 Er 167.26	69 Tm 168.93421	70 Yb 173.04
89 Ac 232.0381	90 Th 232.0381	91 Pa 231.035888	92 U 238.0289	93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)

Figure 1 Periodic table of elements





2.1 Provide the chemical name for Li. (1)

2.2 What is the mass number of Li? (1)

2.3 Use the periodic table provided and identify the unknown element X. Give the NAME of the element. (1)

2.4 Which of these two elements above do human rely on for survival? Elaborate your answer. (2)

2.5 Li is a metal, and element X is a non-metal. Based on their properties, explain how their conductivity and appearance would be different. Tabulate your answer (4)

[9]

QUESTION 3

Study the following investigation and answer the questions that follow.

You are a scientist in a laboratory investigating the boiling point of an unknown liquid. Your aim is to determine its boiling point by carefully heating the liquid and recording its temperature at regular intervals.

A chemical company has provided you with a sample of a clear liquid and wants to know if it could be water or another substance. To identify the liquid, you need to measure its boiling point and compare it with known values

Your Task:

- Set up the experiment correctly.
- Heat the liquid and record its temperature every minute.
- Identify the boiling point by analysing when the temperature stops increasing.
- Plot a graph of temperature vs. time to visually determine the boiling point.
- Conclude whether the liquid could be water or another substance.

Results:

TIME (minutes)	TEMPERATURE (°C)
0	25
1	40
2	55
3	70
4	85
5	95
6	100
7	100
8	100
9	100
10	100

3.1 **Experimental Setup**

a) Why is it important to keep the thermometer in the liquid without touching the beaker? (1)

b) What safety precautions should you take while conducting this experiment? (2)

3.2 **Variables**

a) Identify the independent variable in this experiment. (1)

b) Identify the dependent variable in this experiment. (1)

c) Name one controlled variable to ensure a fair test. (1)

3.3 **Graphing & Analysis**

a) Draw a graph of temperature vs. time using the data provided. (4)

b) What is the boiling point of the liquid based on your graph (1)

c) If the boiling point is not 100°C, what does this suggest about the liquid? (2)

[13]

QUESTION 4

4.1) Name any **THREE** methods of separating mixtures. (3)

4.2) Explain how filtration works and give one example of a mixture that can be separated using this method. (3)

4.3) What is the difference between these terminologies:

4.3.1) A solute and a solvent (2)

4.3.2) A mixture and a solution (2)

4.4) A learner accidentally spilled salt into a bowl of sand.

4.4.1) Suggest a step-by-step method to separate the salt from the sand (3)

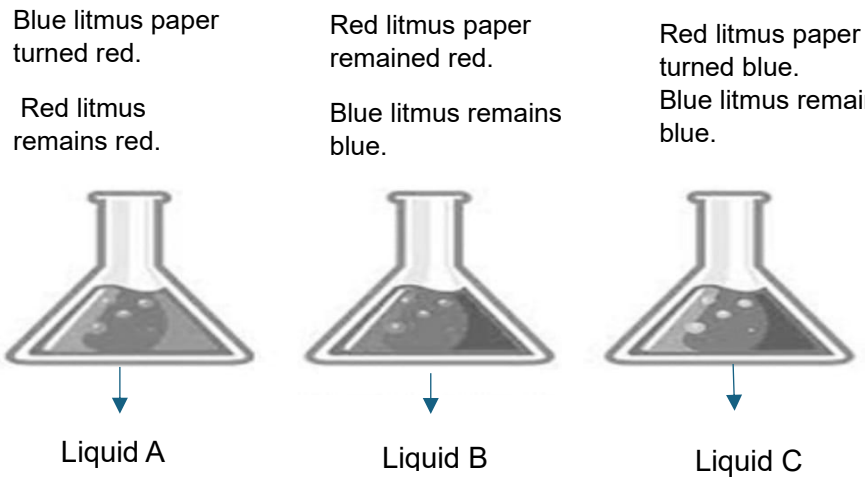
4.4.2) Explain why evaporation is useful in this process. (2)

[15]

QUESTION 5

5.1) Describe the difference between an acid, a base, and a neutral substance based on their properties (3)

5.2) Lebo tested three liquids using blue and red litmus paper



a) Identify whether Liquid A, B, and C are acids, bases, or neutral substances. (3)

b) Explain the function of the litmus paper in the test conducted above. (2)

[8]

SECTION B TOTAL: 45

GRAND TOTAL : 60

