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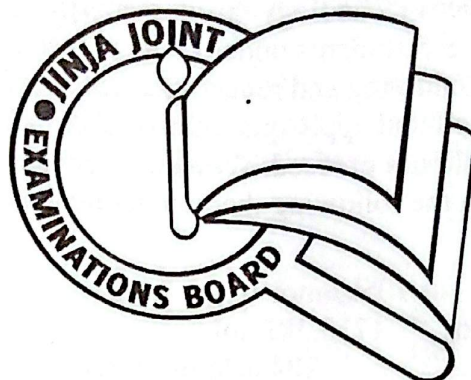
P525/1

CHEMISTRY

Paper 1

August, 2026

2 $\frac{3}{4}$ hours.



JINJA JOINT EXAMINATIONS BOARD

Uganda Advanced Certificate of Education

MOCK EXAMINATIONS –AUGUST, 2026

CHEMISTRY

(Principal Subject)

Paper 1

2 hours 45 minutes.

INSTRUCTIONS TO CANDIDATES:

- This paper consists of **TWO** Sections A and B.
- Section A has **TWO Compulsory** Items.
- Section B has two parts, I and II.
- Respond to only **ONE** Item from each part.
- Responses to Section A and B must be written in the answer booklet(s) provided.
- Respond to **FOUR** Items in all.

**BEGIN EACH QUESTION ON A
FRESH PAGE**

No	Basic Code	Weighted Score	Initials
1			
2			
3/4			
5/6			

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Turn Over

SECTION A

Attempt all Items in this part

Item 1

Electrochemical cells generate energy from spontaneous redox reactions. Their importance lies in driving modern technology through energy storage, industrial manufacturing etc. A group of S.5 students under their science club have undertaken a project to select the strongest oxidizing and reducing agents between Copper and Zinc, construct an electrochemical cell and apply quantitative chemical principles to make recommendations but they could not proceed. When they consulted their chemistry teacher, he provided them with the following thermochemical and electrochemical data.

First ionization energy of Zn	906kJ mol ⁻¹
Second ionization energy of Zn	1733.3kJmol ⁻¹
Hydration energy of Zn ²⁺ (aq)	2046kJmol ⁻¹ First
ionization energy of Cu	754kJmol ⁻¹
Second ionization energy of Cu	1958kJmol ⁻¹
Hydration energy of Cu ²⁺ (aq)	2100kJmol ⁻¹

Half cell	E°/V
Zn(s) Zn ²⁺ (aq)	+0.76
Cu(s) Cu ²⁺ (aq)	-0.34

Task

The S.5 students are now challenged and have approached you. **Task:** As a chemistry student analyse and interpret the data to address the S.5 issues.

Item 2

A manufacturing company in Uganda uses compound X as a primary intermediate for making a dye which gives blue jeans their iconic colour. The laboratory attendant for the company after her analysis discovered that X is immiscible with water, contains 77.3% C, 7.58% H and the rest nitrogen and that a mixture of X (boiling point 180°C) and water (boiling point 100°C) when steam distilled at 760 mmHg and 98°C gave a distillate which contained 85% by mass water.

Management of the company is now interested in molar mass of X, molecular formula of X and the associated applications of steam distillation. (Hint: Saturated vapour pressure of water at 98°C is 734.9mmHg).

The laboratory attendant is now challenged. Your teacher came across this information.

Task:

As a student of chemistry analyse and interpret the available data to address management concerns.

SECTION B PART I

(Attempt only **one** Item from this part)

Item 3

The chemistry of period 3 elements is vital to the foundation of modern technology, biology and industry. A telecom engineer advised that how periodic trends affect reactivity and reactions of the elements with water, alkalis and dilute acids is very important in modern technology.

A manufacturing plant dealing in modern technology equipment is interested in how periodic properties of elements affect reactivity, reactions of elements and the health implications of any of the elements. An industrial chemist provided the plant management with the following data:

Element	Na	Mg	Al	Si	P	S	Cl
Electron affinity (kJmol^{-1})	-20	+67	-30	-135	-60	-200	-364
Ionization Energy (kJmol^{-1})	492	743	579	791	1060	1003	1254

Your laboratory technician came across this information but he is challenged

Task:

As a student of Chemistry prepare a writeup to address the management's concerns

Item 4

The chemistry of Group 17 elements is important for water sanitation, health and industrial manufacturing. An environmental chemist advised that how periodic properties affect reactivity of the elements, reactions of elements with water and alkalis play a great role in their applications in daily life and provided the following data.

Element	F ₂	Cl ₂	Br ₂	I ₂
Atomic radius (nm)	0.072	0.09	0.114	0.133
Boiling point ($^{\circ}\text{C}$)	-188	-35	59	184

A manufacturing company dealing in antiseptics is interested in how periodic trends affect reactivity, reactions of the elements and health implications if any of any element. Your teacher came across this information.

Task:

As a Chemistry student, analyse and interpret the available data to address the company's issues.

PART II

(Attempt only **one** Item from this part)

Item 5

Use of nail polish removers and polymers is increasing in Uganda. A chemical plant makes polythene and ethyl acetate, a nail polish remover from propene and methane respectively. As a way of mitigation, excess raw propene is reacted with bromine water while excess methane is reacted with chlorine gas in UV light.

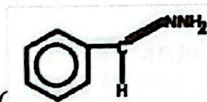
The plant Management is interested in the suitability of its products for their applications, analysis of its mitigation reactions with equations, an evaluation of its synthetic pathways and the possible health implications of its products. Your chemistry teacher came across this information.

Task:

As a student of chemistry make a write up to address the plant management concerns.

Item 6

A school science club wants to produce benzaldehyde hydrazone



() from ethane and propanone (solvent) from propan-1-ol.

One student raised the issue of the managing excess propan-1-ol and the product propanone. The chairperson proposed reacting propanone with 2,4-dinitrophenylhydrazine and propan-1-ol with hot concentrated sulphuric acid as a mitigation measure.

The report was subjected to the patron of the science club who is interested in the suitability of propan-1-ol for its application, analysis of mitigation reaction with equations, an evaluation of synthetic pathways with associated health implications.

Task:

As a student of chemistry analyse and interpret the data to address the club's issues.

THE PERIODIC TABLE

1	2											3	4	5	6	7	8
1.0 H 1																1.0 H 1	4.0 He 2
6.9 Li 3	9.0 Be 4											10.8 B 5	12.0 C 6	14.0 N 7	16.0 O 8	19.0 F 9	20.2 Ne 10
23.0 Na 11	24.3 Mg 12											27.0 Al 13	28.1 Si 14	31.0 P 15	32.1 S 16	35.4 Cl 17	40.0 Ar 18
39.1 K 19	40.1 Ca 20	45.0 Sc 21	47.9 Ti 22	50.9 V 23	52.0 Cr 24	54.9 Mn 25	55.8 Fe 26	58.9 Co 27	58.7 Ni 28	63.5 Cu 29	65.7 Zn 30	69.7 Ga 31	72.6 Ge 32	74.9 As 33	79.0 Se 34	79.9 Br 35	83.8 Kr 36
85.5 Rb 37	87.6 Sr 38	88.9 Y 39	91.2 Zr 40	92.9 Nb 41	95.9 Mo 42	98.9 Tc 43	101 Ru 44	103 Rh 45	106 Pd 46	108 Ag 47	112 Cd 48	115 In 49	119 Sn 50	122 Sb 51	128 Te 52	127 I 53	131 Xe 54
133 Cs 55	137 Ba 56	139 La 57	178 Hf 72	181 Ta 73	184 W 74	186 Re 75	190 Os 76	192 Ir 77	195 Pt 78	197 Au 79	201 Hg 80	204 Tl 81	207 Pb 82	209 Bi 83	209 Po 84	210 At 85	222 Rn 86
223 Fr 87	226 Ra 88	227 Ac 89															
			139 La 57	140 Ce 58	141 Pr 59	144 Nd 60	147 Pm 61	150 Sm 62	152 Eu 63	157 Gd 64	159 Tb 65	162 Dy 66	165 Ho 67	167 Er 68	169 Tm 69	173 Yb 70	175 Lu 71
			227 Ac 89	232 Th 90	231 Pa 91	238 U 92	237 Np 93	244 Pu 94	243 Am 95	247 Cm 96	247 Bk 97	251 Cf 98	252 Es 99	257 Fm 100	258 Md 101	254 No 102	260 Lw 103

END



