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S.4 Mock Examinations 2004

Chemistry

Paper 1

545/2

Time allowed: 1-1/2 hours

Instructions to candidates:

This paper consists of 50 objective questions.

Attempt all questions.

Answers to the questions must be filled in the box at the right hand side of each question

Mathematical tables and non-programmable scientific calculators may be used.

Constants:

1 Faraday = 96500 coulombs

1 mole of gas occupies

(i) 22.4dm^3 at S.t.p

(ii) 24.0 dm^3 at room temperature

Avogadro's constant = 6.02×10^{23}

Atomic masses/g H = 1, C = 12, O = 16, Na = 23, Al = 27

K = 39, (I = 35.5, Cu = 64, Zn = 65

Ag = 108, S = 32

1. Which metal does not react with nitrogen gas?
 A: Magnesium B: lithium C: calcium D: sodium
2. What particles conduct electricity in solutions
 A: electrons B: protons C: neutrons D: ions
3. Which of the following non-metals is the most reactive?
 A: sulphur B: oxygen C: Nitrogen D: Chlorine
4. Hydrogen gas may best be collected by
 A: upward displacement of air
 B: downward displacement of air
 C: downward delivery
 D: collected over sodium hydroxide solution
5. Which of the following is not a product of the decomposition of lead (II) nitrate?
 A: $\text{Pb}(\text{NO}_2)_2$ B: PbO C: NO_2 D: O_2
6. What is observed when oxygen gas is blown into a jar containing ammonia gas into which a red hot copper coil is inserted
 A: white fumes B: Brown fumes
 C: brown and then white fumes D: No observable changes
7. Sodium hydroxide solution is added dropwise until excess to a solution of aluminium ions. What is observed?
 A: white ppt soluble in excess B: white ppt insoluble in excess
 C: yellow ppt insoluble in excess D: reddish brown ppt insoluble in excess
8. Which reagent can be used to test for hydrogen chloride gas?
 A: lime water B: conc ammonia C: bromine D: starch
9. Determine the volume of oxygen gas liberated at S.t.p when a current of 0.85A is passed through dilute sulphuric acid solution for 42 minutes
 A: 124.3cm^3 B: 248.6cm^3 C: 2142cm^3 D: 2240cm^3
10. Determine the volume of a given mass of gas at room temperature given that it occupies 240cm^3 at 85°C at constant pressure. (room temperature = 25°C)
 A: $\frac{240 \times 298}{358}$ B: $\frac{240 \times 358}{298}$ C: $\frac{358 \times 298}{240}$ D: $\frac{25 \times 240}{85}$
11. A colourless gas turns litmus red and decolourises acidified potassium manganate VII solution. The gas is likely to be:
 A: H_2S B: SO_3 C: CO_2 D: Cl_2

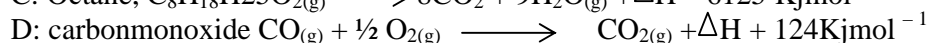
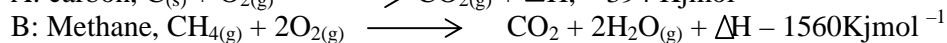
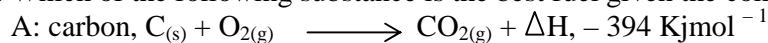
12. Rhombic sulphur
 A: is a pale yellow needle-like crystalline solid
 B: has a melting of 444°C
 C: is stable at temperatures below 96°C
 D: has a density of 1.02g cm^{-3}
13. What are the observations made when concentrated nitric acid is added to sulphur powder?
 A: brown fumes
 B: bubbles of colourless gas
 C: white fumes
 D: bubbles of green gas
14. What are the products of concentrated sulphuric acid and hydrogen sulphide gas?
 A: water and sulphur
 B: water and sulphurdioxide
 C: Hydrogen and sulphurdioxide
 D: water and sulphur trioxide
15. Which compound is used as a catalyst in the manufacture of sulphuric acid?
 A: Manganese IV oxide
 B: Platinum
 C: vanadium V oxide
 D: Platinised asbestos
16. A compound D has a molecular Mass 142g. D consists of 22.5% sulphur, 32.4% and the rest oxygen. Determine the molecular formular of D.
 A: $\text{Na}_2\text{S}_2\text{O}_3$ B: Na_2SO_4 C: Na_2SO_4 D: $\text{Na}_2\text{S}_2\text{O}_4$

Use the table below to answer questions 17 and 18

Particle	Number of		
	Electrons	Protons	Neutrons
W	10	10	10
X	10	12	12
Y	11	11	12
Z	12	12	14

17. Which of the following particles is(are) charged?
 A: W B: X C: Y and Z D: W and Z
18. Which of the particles are isotopes?
 A: W and X B: X and Z C: W and Z D: Y and W
19. When Ethanol is mixed with concentrated sulphuric acid and the mixture heat to about 180°C , the gaseous product has the following properties, except
 A: turns acidified potassium dichromate from orange to green
 B: turns acidified potassium permanganate colourless
 C: turns bromine water colourless
 D: turns lime water milky

20. Which of the following substance is the best fuel given the combustion reactions?



21. Steel is a mixture of

A: iron and carbon

B: Iron and copper

C: zinc and copper

D: zinc and tin

22. Which of the following mixtures can be separated by filtration?

A: $CuSO_4$ and $ZnCl_2$

B: $PbSO_4$ and $BaCO_3$

C: $AgCl$ and $NaHCO_3$

D: K_2CO_3 and $Ca(NO_3)_2$

23. What is observed when nitrogen monoxide is passed over heated magnesium ribbon?

A: white fumes

B: brown fumes

C: colourless gas

D: white powder

24. All the following are hygroscopic substances, except

A: Ethanol

B: concentrated sulphuric acid

C: copper (II) oxide

D: sodium hydroxide

25. Which of the following pairs of reagents can be used to prepare copper (II) sulphate salt?

A: dilute sulphuric acid and copper granules

B: dilute sulphuric acid and copper (II) oxide powder

C: sodium sulphate solution and copper (II) carbonate powder

D: potassium sulphate solution and copper (II) hydroxide power

26. The metal that reacts very slowly with cold water but rapidly with steam is

A: copper

B: Gold

C: Potassium

D: Magnesium

27. The following gases are responsible for air pollution, except

A: sulphurdioxide

B: carbondioxide

C: hydrogen sulphide

D: Nitrogen dioxide

28. The volume of a liquid reagent can best be measured in the laboratory by use of a

A: pipette

B: Measuring cylinder

C beaker

D: burette

29. The non-luminous flame is

A: silent

B: blue

C: sooty

D: large

30. Duralumin is an alloy of

A: zinc and copper

B: lead and tin

C: aluminium, copper, magnesium

D: aluminium and antimony

38. Alkanes can be used
1. as lubricants
 2. for making candles
 3. as engine fuels
 4. for making flares
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39. The products of the thermal decomposition of iron (II) sulphate include
1. iron (II) oxide
 2. sulphurdioxide
 3. water
 4. sulphur trioxide
-
40. The metal(s) below is(are) extracted by reduction process
1. Aluminium
 2. Sodium
 3. Calcium
 4. Zinc
-
41. Which gas(es) is(are) likely to decolourise potassium permanganate solution (acidified)?
1. SO₂
 2. C₃H₆
 3. H₂S
 4. Br₂
-
42. Which reaction(s) can take place?
1. $2\text{CaO}_{(s)} + \text{C}_{(s)} \longrightarrow 2\text{Ca}_{(s)} + \text{CO}_{2(g)}$
 2. $\text{Fe}_2\text{O}_{3(s)} + 3(\text{CO}_{(g)}) \longrightarrow 2\text{Fe}_{(s)} + 3\text{CO}_{2(g)}$
 3. $\text{Cu}_{(s)} + 2\text{HCl}_{(aq)} \longrightarrow \text{CuCl}_{2(aq)} + \text{H}_{2(g)}$
 4. $\text{Mg}_{(s)} + 2\text{HNO}_{3(aq)} \longrightarrow \text{Mg}(\text{NO}_3)_2(\text{Aq}) + \text{H}_{2(g)}$
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43. Ammonia can be used
1. in large scale refrigeration
 2. as a degreasing agent
 3. to manufacture fertilisers
 4. in extinguishing fires
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Each of the questions 44 to 50 consists of an assertion (statement) on the left-hand side and a reason on the right-hand side.

Select:

- A: if both the assertion and the reason are true statements and the reason is a correct explanation of the assertion
- B: if both the assertion and the reason are true statements but the reason is not a correct explanation of the assertion
- C: If the assertion is true but the reason is not a correct statement
- D: if the assertion is not correct but the reason is a true statement.
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Summarised instructions	
Assertion	Reason
A: true	True (reason is a correct explanation)
B: true	True (reason is not a correct explanation)
C: true	Incorrect
D: incorrect	True

44. Graphite conducts electricity because All the four valency electrons on the carbon atoms form covalent bonds
45. During the process of electrolysis of brine using mercury cathode, sodium hydroxide is one of the products because The hydroxyl ions combine with sodium ions directly
46. When concentrated sulphuric acid is added to sugar crystals, a black solid is formed because Concentrated sulphuric acid dehydrates sugar forming carbon
47. Chlorine gas is added to water during sewage treatment because Chlorine is a bleaching agent
48. Thermosets when heated and cooled can not be remoulded on reheating because The molecules of thermalsets disintegrate on heating
49. Soapless detergents do not leave dirty marks on clothes unlike soap because Soapless detergents lather quickly with both hard and soft water
50. Quick lime is added to sugar crystals to remove the brown colour because Quick lime is a hydrosopic substance

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