1. Which ofthe following **apparatus/instruments is most suitable** for obtaining both cooking oil and water from a- mixture of the two?

(A) Filter funnel
(B) Separating funnel
(C) Fractionating column
(D) Volumetric flask

2. Which TWO of the following statements are true about **the arrangement** of electrons, **protons and neutrons in an atom?'**

I. **Protons' and neutrons are found in the-nucleus.**
II. **Electrons can be found anywhere outside the nucleus.**
III. **The number of protons always equals the number** of neutrons.
IV. The number of protons always equals the number of electrons.

(A) I and III
(B) I and IV
(C) II and III
(D) III and IV

5. In descending Group VI I ofthe periodic table, which TWO ofthe fol lowing trends occur?

I. The density **of the elements** increases
II. The relative **atomic** mass of the It **elements decreases**
III. The melting point of the **elements** increases
IV. The reactivity of the elements increases

(A) I and Ill
(B) I and IV
(C) II and III
(D) II and IV

6. **Dilute sulphuric acid is classified as a strong acid because it**

(A) produces 2 moles of hydrogen ions per mole of acid
(B) requires 2 moles ofsodium hydroxide for neutralisation
(C) is almost completely ionised and is a good conductor of electricity
(D) ionises to give both hydrogen ions **and sulphate ions.**

3. Which ofthe following compounds may be conveniently prepared by precipitation?

(A) Barium sulphate
(B) Sodium sulphate
(C) Copper **(II) sulphate**
(D) Magnesium nitrate

4. Which of the atoms represented below by theirelectronicconfiguration willmost readily form a positive ion?

(A) 2,8,1
(B) 2,8,2
(C). 2,8,7
(D) 2,8,8

7. **When a saturated solution of copper (II) sulphate is cooled, crystals of copper (II) sulphate-5-waterbegin to form because solu-**bilityofcopper**(II) sulphate**-5-water

(A) increases with decreasing temperature
(B) decreases with increasing temperature
(C) decreases with decreasing temperature
(D) increases with increasing temperature

8. Thearrangementofelements in the periodic table **is based on**

,(A) relative atomic mass
(B) atomicnumber
(C) massnumber
(D) relative molecular mass

9. When iron (III) sulphate reacts with aqueous potassium iodide,abrown colourationofiodine isproduced. Whichofthefollowingdeductions is correct?

/-(A) **Iron (III) sulphate is a reducing agent.**

(B) The iodide ion, I,' has been oxidised to iodine.

l(C) The.i,on,(III) sulphate has lost **electrons.**

(D) The **iodide ion**, I, **has gained electrons.**

10. **Which of the following statements** about **sodium metal** are CORRECT?

1. It contains Na ions and mobile electrons.
II. ItcontainsNa ionsandmobile electrons.
III. **It contains cations** which repel each **other.**
IV. **It contains anions which repel each other.**

(A) I and III only
(B) land IV only
(C) II and Ill only
(D) II and IV only

11. **When aqueous silver nitrate is added to an aqueous solution ofmagnesium** chloride, a white precipitate forms. The ionic equation forthe formationofthis precipitate is

(A) Mg+(aq) + NO3 (aq) = MgNO3(s)
(B) Age+(aq) + 2Cl (aq) = AgCI2(s)
(C) Mgt+(aq)+2i O3(aq) = Mg (NO3 k)
(D) Ag+(aq) + Cl (aq) = AgCI(s)

12. **In which** TWO of the **following equations are the UNDERLINED reagents acting as oxidising agents?**

1.	2H2 (aq) + SO2(aq) = 2H2O(I) + 3S(s)
It.	1-120Z (l) + H2SO4(aq) + 2KI(aq) = K2SO4(aq) + 2I-I,O(1) + I2(s)
III.	2FeC 1,(aq) + C 12(g) = 2FeC 1,(aq)
IV.	C6O(s) + H2(g) = Cu(s) + H20(1)
(A)	I and Ill
_•(B)	I and IV
(C)	-II and Ili
•(D)	II arid-[_V

13. When crystals of potassium nitrate are dissolved in water, the temperature of the solution decreases because

(A) little energy is required to break down the crystal, structure of the potassium nitrate
(B) heat is always absorbed when a substance dissolves ,
(C) the energy content of dissolved potassium nitrate is higher than that of solid potassium nitrate
(D) potassium nitrate is colder than water

14. The high melting point of ionic compounds may be due to the

(A) arrangement of ions
(B) large numbers of ions
(C) attraction among ions
(D) movement of ions

15. Which of the following **statements about chemical reactions** is NOT correct?

(A) Energy is given out when bonds break and taken in when bonds form.
(B) Chemical reactions involve the making and breaking of bonds.
(C) Endothermic reactions take energy from.the surroundings.
(D) Exothermic reactions give energy to the surroundings.

16. A substance that conducts an electric current but remains chemically unchanged is

(A) aqueous **copper** (II) sulphate
(B) copper
(C) sulphur
(D) solid sodium chloride

17. Which ofthe following can exactly neutral ise 20 cm' of 2.0 mol dm-'sodium hydroxide?

I. 10 cm' of 4.0 mol dm-' hydrochloric acid

it. 10'cm' of2.0 **mol dm-**3 sulphuric acid

III. 20 cm' of 4.0 mol dm' nitric acid

(A) I bnly
(B) ' II only
(C) I and 11 **only**
(D), , II and III only

18 **Some -calcium** carbonate was reacted with excess dilute hydrochloric acid. The volume of carbon dioxide evolved was recorded and plotted against time. Which of the following graphs represents this reaction?

(A)

Total volume of CO2/Cm 3

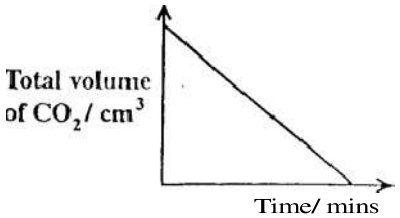
Time/ mins

(B)

Total volume' of CO2/cm3

Titnel mins

(C)



(D)

Total volume of CO2 / cm3

Time/ mins

19. In which of the following processes is fractional distillation NOT used?

(A)	'Refining of crude petroleum	I.
(B)	**Separation** of methanol from a **methanol-water mixture**	II.
(C)	Separation of chlorophyll ina leaf **extract**	III.
(D)	**Separation of liquid air into nitrogen and oxygen**	IV.

20. **Graphite can be used as a lubricant be-** cause of

(A)	**strong attraction between the hexagonal layers of carbon atoms**
(B)	**weak attraction between the hexgonal layers of carbon atoms**
(C)	the **loose electrons** which can move **throughout the, lattice**
(D)	**strong attraction within the hexagonal layers of carbon atoms**

21. Which of the following sulphates are insoluble?

1.	**Barium suiphate**
II.	**Magnesium sulphate**
III.	**Lead sulphate**
IV.	**Aluminium sulphate**
(A)	I and III only
(B)	**I and H only**
(C)	II and IV only
(D)	III and IV only

22. . The **mass** of an element produced in electrolysis is proportional to the

	quantity of electricity which has **been passed**
II.	volume of the electrolyte
III.	mass of the electrolyte
IV.	mass of the electrode
(A)	I only
(B)	II and IV only
(C)	I and III only
(D)	III and IV only

23. **Which of the following statements BEST characterises a catalyst?**

(A) .	It increases the activation energy of the reaction.
(B)	It alters the quantity of the products formed.
(C)	It is always unchanged physically **at the end of a reaction.**
(D)	It is always unchanged chemically at the end of **a reaction.**

24. **Which of the following operations results in sublimation?**

(A)	Heating of solid sodium chloride
(B)	Cooling of oxygen gas
(C)	Heating of ethanol .
(D)	Heating of iodine crystals

25.' **How** many **neutrons and electrons** does the particle $^{24}_{12}X^{2+}$ have?

	Neutrons	Electrons
(A)	12	10
(B)	12	12
(C)	24	10
(D)	24	12

26. Which of the following sources of energy is the MOSTcommonly used in the world today?

(A) Nuclear
(B) Fossil fuels
(C) Biogas
(D) Gasohol

27. Study the following thermochemical equation.

$X + Y = Z, \Delta H = -B\ kJ$

Which of the **following** methods **can be used to compute the value of - B kJ?**

I. Energy of Zminus the energy of X. and Y
H. Energy of X and Yminus the energy of Z
III. The sum of the energies of X, Y and Z

(A) I only
(B) I and II only
(C) III only
(D) II and III only

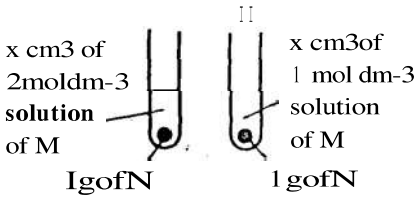
28.	**Which of the following processes provides evidence in support of the particulate nature of matter?**	
	(A) Diffusion **(B) Precipitation** (C) Condensation (D) Filtration	(D);

29. Sulphuric acid forms the sodium salts NaHSO4 and Na2SO4. Its basicity is therefore

(A)
(B) 2
(C) 3
(D) 4

30. A sample of substance N was placed in solution M. Which ofthe'followingdiagrams represents pairs of experiments that would be most suitable to determine how the concentration of M affects the rate of the reaction?

(A)



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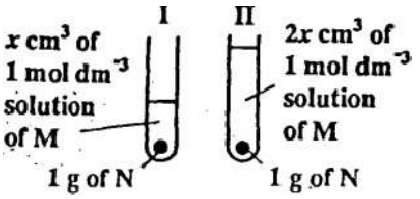
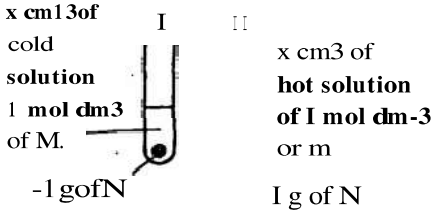
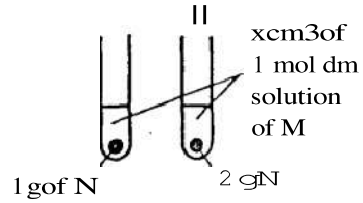


(C)





31. Atoms of **isotopes**, X and Y, have

I. the same number of electrons..
II. the same number of protons.
III. different numbers of neutrons.

(A) III only
(B) II and III only
(C) I and II only
(D) I, Hand III

32. Which ofthe following could produce carbon dioxide and carbon monoxide as pollutants?

I. Geothermal energy
II. Solar energy
III. Fossil fuels
'IV. Biogas

(A) I only
(B) H only
(C) II and III only
(D) III and IV only

33. At 1 atmosphericpressure,,the particles move fastest in a

(A) liquid at 25 °C
(B) gas at 25 °C
(C) liquid at 100 °C
(D) gas at 100 °C

34. Which of the following pairs of acids is monobasic?

(A) HCl and CH*3CO2H

(B) HCl and H2SO4

(C) HNO3 and H2S04

(D) CH3 *CO,H and HO2000,H

35. **All of the following gases are colourless EXCEPT**

(A) 02
(B)
(C) **NO2**
(D) NH3

36. Which of the following elements reacts most vigorously with I-t (aq) ions to give hydrogen gas?

(A) Zinc
(B) Lead
(C) Iron
(D) Copper

37. Which of the following is a weak electrolyte?

(A) Molten lead
(B) Aqueous ethanoic acid
(C) Dilute hydrochloric acid
(D) Molten lead bromide

Item 38 refers to the following diagrams.

I

Dilute sulphuric acid

Calcium carbonate

II

Dilute hydrochloric acid

Calcium carbonate

III

Dilute sulphuric acid

Calcium carbonate

IV

Dilute hydrochloric acid

Calcium carbonate

38	In which of the experiments would the amount of carbon dioxide collected be GREATEST?		
	(A) I		
	(B) II		
	(C) III		
	(D) IV		3.

39.	Which of the following gives an alkaline reaction with moist litmus paper?	
	(A) Ammonia	
	(B) Nitrogen (IV) oxide	
	(C) Hydrogen chloride	
	(D) Water	

40. Which of the following aqueous solutions will produce blue precipitate with aqueous sodium hydroxide?

(A) **Calcium nitrate**
(B) **Iron (11) nitrate**
(C) Copper (11) **nitrate**
(D) **Aluminium nitrate**

41. Which of the following **statements** is true?

(A) Ammonia is an acidic gas.
(B) Ammonia is soluble in water and functions as a base.
(C) Nitric acid **is used as a** fertilizer and **a reducing agent.**
(D) Nitric acid **contains** two. replaceable hydrogen atoms.

42. Aluminium is more reactive than iron yet, after a while, a piece of aluminium left exposed to the atmosphere becomes corrosion resistant whilst a similar piece of iron continues to corrode. This is because the

(A) aluminium has reacted completely
(B) iron oxide formed is more reactive **than the aluminium** oxide formed
(C) oxide film **on aluminium** protects the **metal** from further corrosion but the **oxide film on iron does not**
(D) iron oxide reacts with the iron below **but aluminium** oxide does not react with the aluminium below

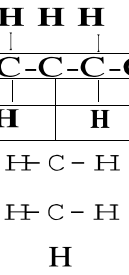
Which of the following methods is used for the extraction of metals at the top of the electrochemical 'series?

(A)	Electrolysis of molten chloride
(13)	~~Electrolysis of aqueous chloride~~
(C)	Electrolysis **of molten oxide**
(D)	**Reduction of oxide with carbon**

44. **Which of the following metals will NOT react with water under any conditions?**

(A) **Magnesium**
(B) **Aluminium**
(C) **Iron**
(D) **Copper**

48. **A compound has the following structural formula.**



Which TWO of **the following statements are** correct? The **compound**

I..	is an alcohol.
II.	is a branched alkane.
III.	can react with sodium.
IV.	Js an unreactive substance.

(A) I and III
(B) I and IV
(C) H and III
(D) II and IV

45. Which of the following observations would you expect to make when excess sodium hydroxide **solution is** added to a solution containing **zinc ions?**

(A) An alkaline'gas produced
(B) White precipitate soluble in excess
(C) White precipitate insoluble in excess
(D) A green precipitate insoluble inexcess

Items 46-47 refer to the following organic compounds.

(A) Ethanol
(B) Ethene
(C) Ethanoic acid
(D) Ethyl ethanoate

In answering **items**. 46-47 a particular choice from the above maybe made more than once, once, or not **at all.**

Which of the **organic compounds**

46. undergoes addition reactions?

47. is immiscible with waterand is sweet-smelling?

49. Which of the following would you expect to form an addition polymer?

(A)

(B)

(C)

(D)

J

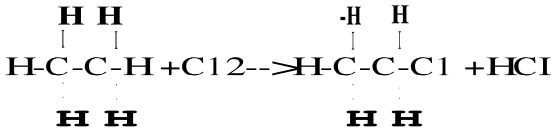
50. **Ethanol** is NOT **used asa**

(A) beverage
(B) fuel
(C) lubricant
(D) solvent

51. In whichofthe following istheamide linkage **present?**

(A) Polythene
(B) Nylon
(C) Starch
(D) Terylene

52



The equation shown above represents a reaction which is classified as

(A) addition
(B) neutralisation
(C) polymerisation
(D) substitution

53. **Yeast may be used in the fermentation of starch to ethanol because**

(A) **it is acidic**
(B) **it contains enzymes which act on starch**
(C) yeast itself **produces the ethanol**
(D) it fixes **the oxygen needed in the reaction from the atmosphere**

54. The process by which large molecules of hydrocarbon are broken up into smaller molecules is called

(A) saponification
(B) cracking
(C) polymerization
(D) condensation

.55. Which ofthe following is/are condensation polymers?

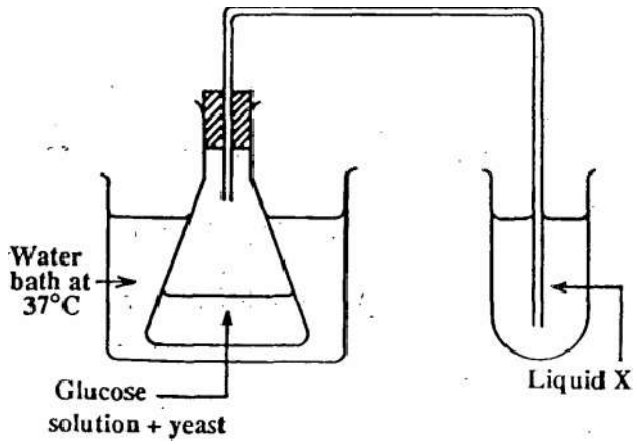
I. Terylene
II. Nylon
III. Starch
IV. Polythene

(A) I only
(B) I and IV only
(C) I, II and III only
(D) II, III and IV only

56. Which of the following substances gives a blue colouration with iodine?

(A) Fats..
(B) **Starches**
(C) Proteins
(D) Polyamides

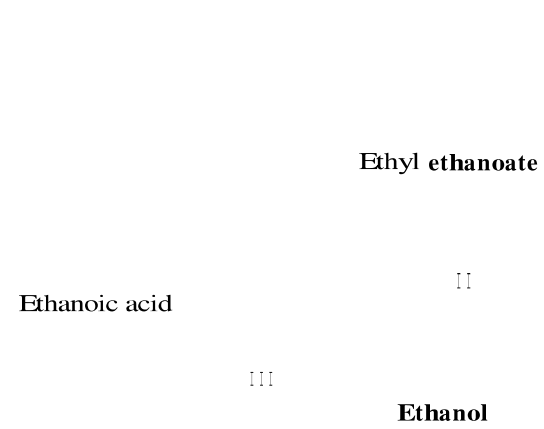
Item 57 refers to the following diagram of an experiment.



57. The gas produced can be BEST identified ilLiquid Xis

(A) li me water
(B) litmusselution
(C) bromine water
(D) sodium hydroxide solution

Items 58 - 59 refer to the following diagram which represents three conversions in organic chemistry



58. Which ofthe following equations BEST represents Conversion I?

(A) CH3000H + C2H50H -a CH3000C2H5 + H2O

(B) CH3COOH + C2HSOH C2H5000CH3 + H2O

(C) CH3000H+C2H5OH - CH3000C2H5 +H2O

(D) CZHSCOOH +C2H5OH - C2H5000C-H5 ± H2O

59. For Conversion II, ethyl ethanoate is heated under reflux with another compound. The name of the compound is

(A) sodium chloride
(B) ethanol
(C) fatty acids
(D) sodium hydroxide

60. The compound propene, CH3CH=CH2' reacts with bromine to produce

(A) CH3CBrCHBr + HBr

(B) CH3CHBrCH2Br + HBr

(C) CH3C1-12CHBr2

(D) CH3CHBrCH,Br

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.