CHEMISTRY

FOR

Senior Secondary School

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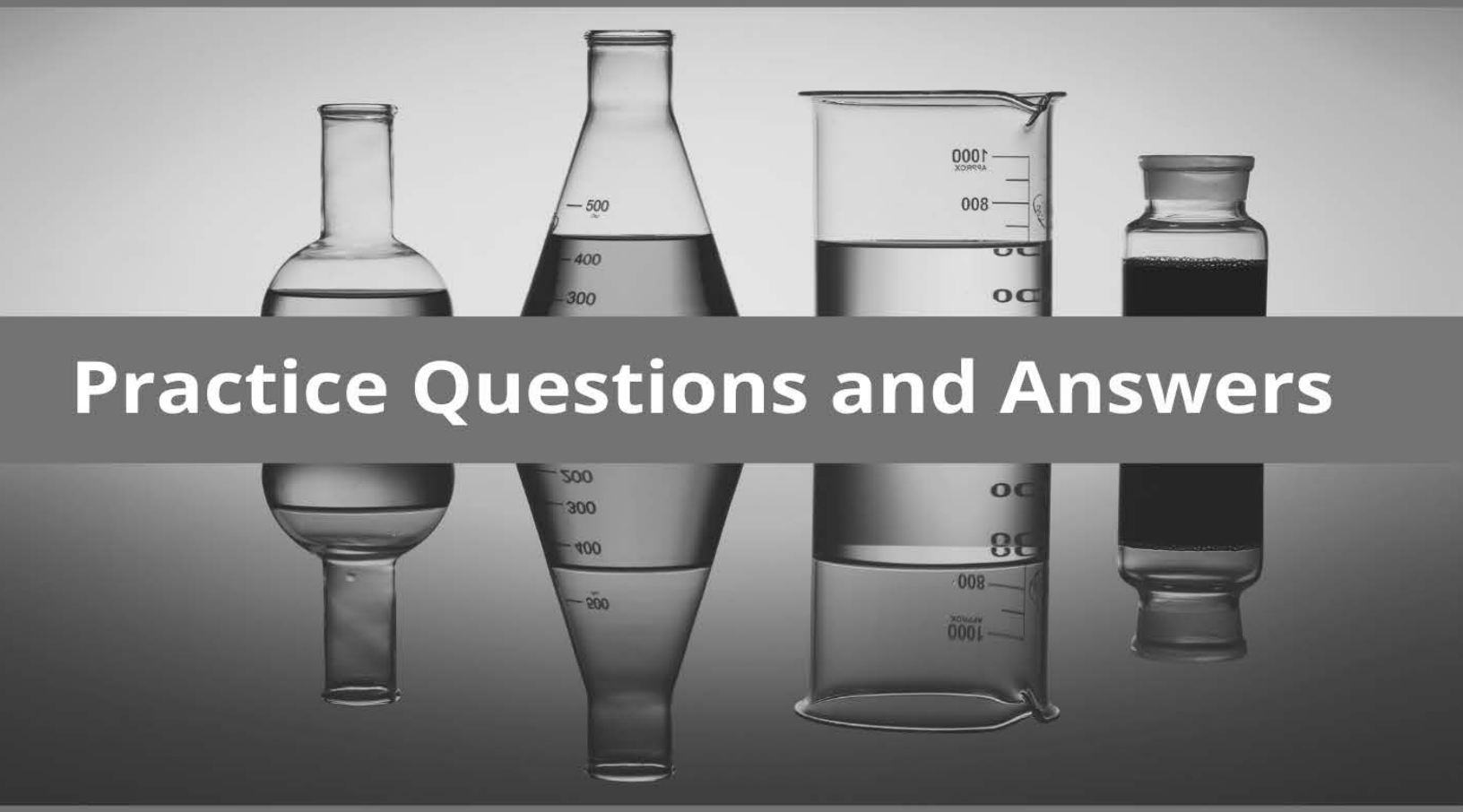


Practice Questions and Answers

EDUBASE

QUESTIONS

TOPIC: CHEMISTRY OF EARTH AND SPACE

DIRECTION: Choose the correct answer from the lettered options.

1. How many moons does Jupiter have?

A. 8

B. 16

C. 15

D. 20

2. The density of earth is _____.

A. 5.52g cm^{-3}

B. 5.10g cm^{-3}

C. 3.93g cm^{-3}

D. 5.44g cm^{-3}

3. What planet is famous for the beautiful rings that surround it?

A. Saturn

B. Jupiter

C. Neptune

D. Uranus

4. A galaxy is a huge collection of _____, _____ and _____.

A. planets, star and dust

B. planets, stars and gas

C. stars, gas, and sun

D. stars, gas and dust

5. How many moons does Neptune have as at 2013?

A. 13

B. 15

C. 18

D. 20

6. _____ is observed when emitted light passes through a material that partially absorbs it before it is dispersed.

A. Adsorption spectra

B. Emission spectra

C. Absorption spectra

D. Thermionic spectra

7. All planets revolve around the sun in the same direction and at the same time except _____.

A. earth

B. venus

C. mars

D. mercury

8. A _____ is formed when a giant star collapses suddenly and explodes when the helium in its core are used up in fusion reactions.

A. supernova

B. big bang

C. explosion

D. Milky Way

9. _____ is observed when light from a source undergoes dispersion directly.

A. Thermionic spectra

B. Light spectra

C. Emission spectra

D. Absorption spectra

10. The solar atmosphere is composed of _____ layers.

A. 3

B. 4

C. 1

D. 2

11. Which of the following is a frozen planet?

A. Earth.

B. Mars.

C. Mercury.

D. Pluto.

12. What planet is known as the red planet?

A. Earth

B. Mars

C. Mercury

D. Venus

13. Which of these options are two types of spectra?

(i) Emission and absorption spectra

(ii) Emission and adsorption spectra

(iii) Emission and light spectra

(iv) Absorption and thermionic spectra

A. (ii) only

B. (i) only

C. (iii) only

D. (iv) only

14. The solar system is made up of _____.

A. The sun, asteroids, comets, meteoroids and the planets with their moons orbiting round it.

B. The sun, asteroids, comets, meteoroids, stars and the planets with their moons

C. The sun, asteroids, comets, meteoroids and the stars their moons orbiting round it.

D. The planets with their moons, asteroids and meteoroids

15 The following options are constituents of the earth with the exception of _____.

A. lithosphere

B. atmosphere

C. hydrosphere

D. galaxy

16. The solar atmosphere is composed of a lower layer called _____ and higher layer called ____.

A. chromosphere, photosphere

B. corona, chromosphere

C. chromosphere, corona

D. photosphere, corona

17. The earth is made up of _____.

(i) the atmosphere

(ii) the hydrosphere

(iii) the lithosphere

A. (i) & (ii) only

B. (i), (ii) & (iii)

C. (iii)

D. (ii) & (iii) only

18. The layer of the atmosphere extending from about 10 to 17 km to about 45 km above the surface of the earth is known as _____.

A. stratosphere

B. troposphere

C. mesosphere

D. thermosphere

19. The earth is a made up of _____ parts.

A. 2

B. 4

C. 3

D. 1

20. The density of mercury is _____.

A. 5.10g cm^{-3}

B. 3.93g cm^{-3}

C. 5.44g cm^{-3}

D. 5.52g cm^{-3}

21. The sun is a _____.

A. star

B. universe

C. planet

D. galaxy

22. The region of the atmosphere extending from about 75 km to about 400 km is known as _____.

A. stratosphere

B. thermosphere

C. troposphere

D. mesosphere

23. Which of the following options are the planets with the highest carbon (IV) oxide in the atmosphere?

A. Mercury and Venus

B. Mars and Earth

C. Venus and Mars

D. Mercury and Jupiter

24. Ganymede is a moon of which planet?

A. Mercury

B. Venus

C. Earth

D. Jupiter

25. The lower layer (up to about 10 km at the poles and about 17 km at the equator) above the earth's surface is known as the _____.

A. stratosphere

B. lithosphere

C. mesosphere

D. troposphere

26. The outermost part of the lithosphere is called _____

A. atmosphere.

B. crust.

C. hydrosphere.

D. rock and soil.

27. Stars are grouped according to _____ spectral classes.

A. 8

B. 6

C. 5

D. 7

28. The ozone layer occurs in the _____ of the atmosphere.

A. troposphere

B. mesosphere

C. stratosphere

D. ionosphere

29. The lithosphere is made up of _____, _____ and _____.

A. crust, rocks and core

B. crust, soil and core

C. crust, mantle and core

D. crust, mantle and gas

30. The largest planet is _____.

A. earth

B. pluto

C. jupiter

D. mars

31. Which planet has the highest moons rotating around it?

A. Uranus

B. Earth

C. Jupiter

D. Saturn

32. Which of the planets are known as terrestrial planets?

A. Mercury, Venus, Earth and Mars.

B. Mercury, Jupiter, Earth and Mars.

C. Mercury, Venus, Earth and Saturn.

D. Mercury, Earth, Mars and Uranus.

33. What is the name of the second biggest planet in our solar system?

A. Uranus

B. Neptune

C. Jupiter

D. Saturn

34. _____ is used in the study of planets and stars.

A. Spectroscopy

B. Electron microscope

C. Radioactivity

D. Neutrino

35. In the solar system, the largest planet is _____

A. earth.

B. jupiter.

C. mercury.

D. pluto.

TOPIC: CHEMISTRY, INDUSTRY AND THE ENVIRONMENT

DIRECTION: Choose the correct answer from the lettered options.

1. The furnace in which glass is melted is _____.

A. blast furnace

B. tank furnace

C. solvay process

D. open hearth furnace

2. Write an equation for the reaction of aluminium oxide with sodium hydroxide.

A. $Al_2O_3 + 2OH^- \rightarrow 2[Al(OH)_4]^-$

B. $Al_2O + 2OH^- + 3H_2O \rightarrow 2[Al(OH)_4]^-$

C. $Al_2O_3 + 2OH^- + 3H_2O \rightarrow 2[Al(OH)_4]^-$

D. $Al_2O_3 + 2OH^- + H_2O \rightarrow [Al(OH)_4]^-$

3. Fine chemicals have the following characteristics except _____.

A. they are chemically pure

B. they are produced by batch process

C. they are produced in large quantity because of high applicability

D. they are produced in small quantity because of limited applicability

4. Urea, Ammonium nitrate and Ammonium sulphate are examples of _____.

A. nitrogenous fertilizers

B. potassium fertilizers

C. phosphate fertilizers

D. sulphate fertilizers

5. The plastic industry is divided into _____ categories.

A. 3

B. 2

C. 4

D. 1

6. Polypropylene and polystene belongs to _____.

A. thermoplastic

B. thermosetting plastic

C. cold setting plastic

D. warm setting plastic

7. The substances added to the soil to provide one or more nutrients are called _____.

A. growth harmonies

B. minerals

C. fertilizers

D. none of the above

8. Artificial or mineral fertilizers generally contain _____.

A. N, P or K

B. N, P or H

C. C, H and O

D. C, H and N

9. Which of the following is a gaseous pollutant of the air?

A. Oxygen

B. Nitrogen

C. Sulphur (iv) oxide

D. Carbon (iv) oxide

10. The four main sources of raw materials for the plastiics and synthetic organic chemical industries are _____, _____, _____ and _____

A. coal, limestone, glucose and malt

B. coke, lime, cellulose and malt

C. coal, limestone, cellulose and molasses

D. coke, lime, glucose and molasses

Bauxite is an ore containing hydrated aluminium oxide, iron (III) oxide and silicon dioxide. In order to obtain a purer form of aluminium oxide bauxite is heated with a 10% solution of sodium hydroxide in which the aluminium oxide dissolves.

11. Why does iron (III) oxide not dissolve in sodium hydroxide?

A. Iron (III) oxide is an acidic oxide

B. Iron (III) oxide is an basic oxide

C. Iron (III) oxide is an neutral oxide

D. Iron (III) oxide is an amphoteric oxide

12. White lead is a pigment with formula _____.

A. $PbCO_3$

B. $Pb(OH)_2$

C. $Pb(OH)_2.2PbCO_3$

D. Pb_3O_4

13. Fertilizers maintain the pH of soil at one of these ranges;

A. from pH 7 to 8.

B. at pH 7.

C. above pH 10.

D. below pH 3.

14. Acidic industrial waste can be treated with _____

A. lime.

B. brine.

C. water.

D. ethanol.

15. Plastics are classified into _____.

A. two main types

B. three main types

C. four main types

D. none of the above

16. A paint is usually composed of _____.

A. binder

B. pigments

C. thinner or solvents

D. all of the above

17. Examples of heavy chemicals include the following except _____.

A. NaOH

B. perfumes

C. H_2SO_4

D. NH_3

18. The major raw materials in a plastic industry is _____

A. ethanol.

B. sulphur.

C. methylethanoate.

D. ethene.

19. Wash and wear clothes are manufactured using _____.

A. terylene fiber

B. nylon fider

C. wool fiber

D. cotton missed with water

20. The best phosphate fertilizer containing high percentage of assimilable P2O5 is _____.

A. double phosphate

B. super phosphate

C. triple phosphate

D. phosphorite

21. Ceramics have the following characteristics except _____.

A. amenable to corrosion since they are of earthly impurities

B. heat and chemical resistant

C. it withstands stress

D. they are strong and durable

22. The hydrophobic part of detergent molecule is _____.

A. water attracting

B. water repelling

C. both A & B

D. none of the above

23. Which of the following is not a polymer?

A. Rubber

B. Cellulose

C. Fructose

D. Protein

24. Cellulose acetate is _____.

A. a semi-synthetic fiber

B. a natural fiber

C. lies between a semi and true synthetic fiber

D. a true-synthetic fiber

25. Which of the following is a thermosetting plastic?

A. Bakelite

B. Polyethylene

C. Polystyrene

D. None of the above

26. Hydrophobic part of detergents readily dissolves in _____.

A. water

B. grease

C. both A & B

D. none of the above

27. Plastics are _____.

A. synthetic polymer

B. solvents

C. acids

D. salts

28. A cement factory is usually sited near a commercial deposit of _____

A. $Al_2(SO_4)_3$.

B. $CaCO_3$.

C. FeS.

D. $MgCO_3$.

29. Crude oil spillage on a river can be dispersed by spraying the water with _____.

(I) disinfectant

(II) kerosene.

(III) petrol.

(IV) detergent.

A. IV.

B. III & IV.

C. I, II & III.

D. I, II, III & IV.

30. Which of the following is a pollutant in drinking water even in trace amounts?

A. $Ca^{2+.}$

B. $Hg^{2+.}$

C. $Mg^{2+.}$

D. $Fe^{2+.}$

31. A plastic which cannot be softened by heat is described as _____

A. thermosetting.

B. non-biodegradable.

C. thermoplastic.

D. malleable.

32. _____ are sodium and potassium salts of long chain fatty acids.

A. Soaps

B. Detergents

C. Esters

D. Fertilizers

33. Which part of the chemical industry manufactures drugs and medicines?

A. Petrochemical.

B. Plastics.

C. Pharmaceutical.

D. Dyestuffs.

34. Paints and varnishes are manufactured in many factories in _____.

A. Karachi

B. Lahore

C. Hyderabad

D. All of the above

35. The temperature at which PVC is formed is _____.

A. 80°C

B. 20°C

C. 50°C

D. 100°C

36. _____ is defined as one that uses chemistry to make chemicals from other chemical substances.

A. Fine chemicals

B. Chemical industry

C. Heavy chemicals

D. Fertilizers

37. Fertilizers that are derived from plants and animals are called _____.

A. artificial fertilizers

B. natural fertilizers

C. synthetic fertilizers

D. organic fertilizers

38. Which is not a natural polymer?

A. Silk

B. Wool

C. Leather

D. Nylon

39. Bakelite plastic is formed by the combination of _____.

A. form aldehyde and phenol

B. acet aldehyde and phenol

C. benz aldehyde and phenol

D. acetone and phenol

40. What is meant by the term dynamic equilibrium?

A. Reacts at both directions and at equal rates.

B. Reacts in one direction.

C. Reacts at equal rates.

D. Reacts at different directions and at equal rates.

41. A consequence of global warming is _____

A. flooding.

B. air pollution.

C. water pollution.

D. increased humidity.

42. The following are divisions of chemical industries except _____

A. cement.

B. plastic.

C. pharmaceutical.

D. block.

43. A varnish may be regarded as _____.

A. unpigment colloidal dispersion

B. solution of natural resin

C. solution of synthetic resin

D. all of the above

44. The major difference between cement and mortar is that _____.

A. mortar is always white

B. cement hardens by giving off water

C. mortar hardens by giving off water

D. cement is always coloured because of superheating

45. Which of the following gases is the most dangerous pollutant?

A. Hydrogen sulphide.

B. Carbon (IV) oxide.

C. Sulphur (IV) oxide.

D. Carbon (II) oxide.

46. Widely used thinner in paints is _____.

A. water

B. kerosene oil

C. linseed oil

D. turpentine oil

47. Which of the following compound gives green colour to glass?

A. CuO

B. Cr_2O_3

C. CoO

D. ZnO

48. The substances which boost up the power of detergents are called _____.

A. stabilizers

B. builders

C. surfactants

D. additive

49. The following are heavy chemicals except _____.

A. tetraoxosulphate (vi) acid

B. dyes

C. sodium trioxocarbonate (iv)

D. ethene

50. The following option are examples of heavy chemicals except _____.

A. sodium hydroxide

B. ammonia

C. hydrogentetraoxosulphate (VI) acid

D. hydrogen chloride

51. These are examples of chemical industries except _____.

A. photosynthesis

B. solvay process

C. electrolysis of brine

D. contact process

52. The production of plastics involves these conditions with the exception of _____.

A. high temperature

B. low temperature

C. high pressure

D. setting

53. The monomer of PVC is _____.

A. succinic acid

B. vinyl chloride

C. propylene

D. glycol

54. Which of the following substances cannot be classified as a heavy chemical?

A. $AgNO_3$.

B. CaO.

C. $CaOCl_2$.

D. H_2SO_4.

55. Which of the following pollutants is biodegradable?

A. Sewage.

B. Plastics.

C. Metal scraps.

D. Lead compounds.

56. Waste plastics accumulate in the soil and pollute the environment because plastic materials are _____

A. insoluble in water.

B. non-biodegradable.

C. easily affected by heat.

D. inflammable.

57. Chrome yellow is a pigment with formula _____

A. Pb_3O_4

B. $PbCrO_4$

C. K_2CrO_4

D. $MnCrO_4$

58. Factors, which can contribute to environmental pollution, include _____

(I) overpopulation.

(II) chemical warfare.

(III) agricultural activities.

(IV) industrialization.

A. I & II.

B. III & IV.

C. I, II & III.

D. I, II, III & IV.

59. Metallurgy is a scientific process which involves the following except _____.

A. manufacture of alloys

B. refining of metals

C. manufacture of both natural and artificial catalysts

D. grading of metals

60. Detergents are better than soaps for laundering because _____.

A. detergents are synthetic while soaps are not

B. detergents are more soluble in water than soap

C. scum is precipitated when soaps are used with hard water but not detergents

D. soaps form soluble salts with ions causing hardness while detergents do not

TOPIC: NON METALS AND THEIR COMPOUNDS

DIRECTION: Choose the correct answer from the lettered options.

1. Both the melting point and boiling point of Cl2 gas are very low. However it is very difficult to dissociate Cl2 molecules into Cl atoms. Which one of the following best explains these properties of chlorine?

A. The intramolecular bonding of Cl2 is weaker than the intermolecular bonding

B. The intramolecular bonding of Cl2 is stronger than the intermolecular bonding

C. The intramolecular bonding of Cl2 is identical to the intermolecular bonding.

D. Both Cl2 and Cl have weak dispersion (London) forces.

2. Which of the following statements is not true?

A. Carbon exhibits allotropy

B. Sulphur exhibits allotropy

C. Chlorine exhibits allotropy

D. Nitrogen is a gas

3. Which of the following gases will bleach moist litmus paper?

A. Cl_2.

B. CO_2.

C. SO_3.

D. HCl.

4. Efflorescence substances are also _____

A. efflorescent.

B. anhydrous.

C. hydroscopic.

D. insoluble.

5. Which of the following describes why water has an unusually high boiling temperature?

A. Water molecules have strong H-bonding.

B. The O-H bonds are broken up at the point of boiling.

C. The water molecule contains strong covalent bonds.

D. Water molecules have strong dispersion forces.

6. Nitrogen is prepared on a large scale by the _____

A. fractional distillation of liquefied air.

B. decomposition of ammonium dioxonitrate (III).

C. electrolysis of brine.

D. Haber process.

7. Which of the following processes are suitable for investigating whether or not a liquid is pure water?

(I) Testing it with anhydrous copper (II) tetraoxosulphate (IV).

(II) Testing it with cobalt (II) chloride paper.

(III) Testing it with iodine.

(IV) None of the above.

A. I & II.

B. III & IV.

C. I, II & III.

D. I, II, III & IV.

8. Which of the following non-metals react readily with metals?

A. Nitrogen

B. Chlorine

C. Sulphur

D. Carbon

9. When sodium reacts with water, the resulting solution is _____

A. weakly acidic.

B. neutral.

C. acidic.

D. alkaline.

10. If sulphur is dissolved in carbon (IV) sulphide and the solution allowed to evaporate, the allotrope of sulphur formed is _____

A. plastic sulphur.

B. amorphous sulphur.

C. rhombic sulphur.

D. monoclinic sulphur.

11. An acid anhydride is an oxide of a non-metal _____

A. which will not dissolve in water.

B. whose solution in water has a pH greater than 7.

C. whose solution in water has a pH less than 7.

D. whose solution in water has a pH of 7.

12. Pipe-borne water is usually chlorinated in order to _____

A. improve the taste of the water.

B. remove the hardness in the water.

C. coagulate sediments in the water.

D. kill harmful bacteria.

13. Which of the following is correct of the ammonia molecule?

A. It has a tetrahedral shape.

B. It has a lone pair of electron.

C. The N-H-N bond angle is 180 degree.

D. It is a non-polar molecule.

14. Potassium tetraoxomanganate (VII) is often added to improve water to _____

A. reduce organic impurities.

B. reduce inorganic impurities.

C. destroy bacteria and algae.

D. remove permanent hardness.

15. The halide used widely in photography is _____

A. silver bromide.

B. ammonium chloride.

C. calcium chloride.

D. sodium bromide.

16. Which of the following is not used as a raw material in the Solvay process?

A. Ammonia

B. Sodium chloride

C. Calcium trioxocarbonate (IV)

D. Sodium trioxocarbonate (IV)

17. Synthetic detergents are preferred to soap for laundry using hard water because _____

A. detergents are water soluble while soap is not.

B. the calcium salts of detergents are water soluble.

C. the magnesium salt of soap is soluble in hard water.

D. soap does not.

18. The following are the uses of sulphur except in the _____.

A. manufacture of tetraoxosulphate (vi) acid

B. prevention of the growth of fungi

C. cooling of steel to prevent rusting

D. manufacture of dyes

19. Oxygen can be produced by heating _____

A. ammonium trioxinitrate (V).

B. ammonium trioxinitrate (III).

C. potassium trioxo-chlorate (V).

D. magnesium (IV) oxide.

20. Which of the following is a water pollutant?

A. Fertilizer.

B. Human waste.

C. Industrial waste.

D. All of the above.

21. Which of the following are produced when ammonium trioxonitrate (V) crystals are cautiously heated in a hard round-bottom glass flask?

A. N_2O and Steam.

B. NO_2 and Ammonia.

C. N_2O_4 and NO_2.

D. NO and NO_2.

22. Which of the following can be obtained by fractional distillation?

A. Nitrogen from liquid air.

B. Sodium chloride from seawater.

C. Iodine from a solution of iodine in carbon tetrachlorate.

D. Sulphur from a solution of sulphur in carbon disulphide.

23. What is the mass of one molecule of nitrogen gas N2?

A. $\frac{14.0}{2 \times 6.02 \times 10^{23}} g$

B. $\frac{14.0}{6.02 \times 10^{23}} g$

C. $\frac{2 \times 14.0}{6.02 \times 10^{23}} g$

D. 2 x 14.0 x 6.02 x 1023 g.

24. Ammonia decomposes at temperatures above 500oC to yield _____

A. urine.

B. nitrogen dioxide.

C. ammonium.

D. ammonium chloride.

25. Helium is preferred to hydrogen in filling balloons because hydrogen is _____

A. inflammable.

B. diatomic.

C. an isotopy.

D. a component of water.

26. Amphoteric oxides are oxides which _____

A. react with water to form oxides.

B. react with water to form alkali.

C. show neither acidic nor basic properties.

D. react with acids and alkali.

27. Which of the following will decrease in mass when heated in air?

(I) Magnesium ribbon.

(II) Powdered sulphur.

(III) Calcium trioxocarbonate (IV).

(IV) Magnesium tetraoxosulphate (IV) heptahydrate.

A. I & II.

B. III & IV.

C. I, II & III.

D. I, II, III & IV.

28. In the Haber process for the manufacture of Ammonia, the catalyst commonly used is finely divided _____

A. vanadium.

B. platinum.

C. iron.

D. copper.

29. Sulphur exists in six forms in the solid state. This property is known as _____

A. isomerism.

B. allotropy.

C. isotopy.

D. isomorphism.

30. Which of the following oxides of nitrogen is unstable in air?

A. NO_2

B. NO

C. N_2O_4

D. N_2O_5

31. Which one of the following statements best describes the unusually high boiling point of water?

A. The covalent O-H bond in water is very strong.

B. The dipole-dipole intermolecular forces between water molecules are strong

C. Water consists of H+and OH- ions.

D. Water molecules interact with each other through very strong London dispersion forces.

32. Which of the following solids is a molecular substance?

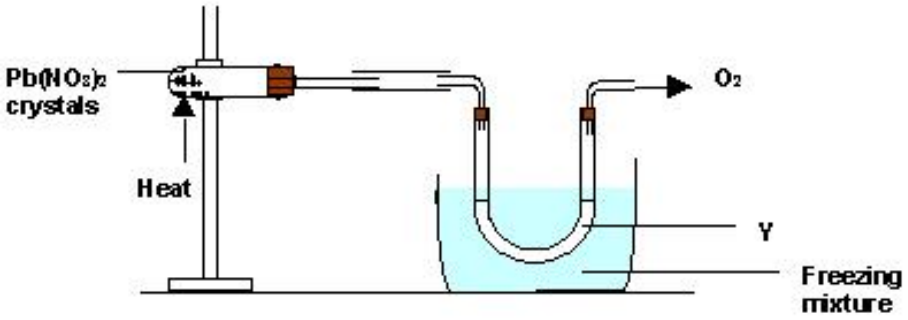
A. Copper.

B. Diamond.

C. Phosphorus.

D. Sodium chloride.

33. In the diagram, Y is _____.



A. NO_2

B. N_2O_5

C. N_2O_4

D. NO

34. Which of the following best describes the forces that allow nitrogen to condense to the liquid state?

A. Covalent bonding.

B. Hydrogen bonding.

C. Intermolecular bonding.

D. Intramolecular bonding.

35. The addition of water to calcium oxide leads to _____

A. a physical change.

B. a chemical change.

C. the formation of a mixture.

D. an endothermic reaction.

36. Chlorine gas turns a damp starch iodide paper into _____

A. dark blue.

B. pink.

C. orange.

D. red.

37. Causes of hardness of water include the presence of _____

A. calcium tetraoxosulphate (VI).

B. magnesium tetraoxosulphate (VI).

C. calcium hydrogen trioxocarbonate (VI).

D. all of the above.

38. A positive brown ring test indicates the presence of _____

A. NO_3.

B. $Fe^{3+.}$

C. $SO_2^{-3.}$

D. Cu.

39. Chlorine, bromine and iodine resemble one another in that they _____

A. dissolve in alkalis.

B. react violently with hydrogen without heating.

C. are liquids.

D. displace one another from solutions of their salts.

40. Gases which are used as cooling agents include _____

(I) nitrogen.

(II) ammonia.

(III) benzene.

(IV) oxygen.

A. I & II.

B. III & IV.

C. I, II & III.

D. I, II, III & IV.

41. To study solubilities, a solution of sodium sulphate is added to a solution of each of the following compounds:

(I) Barium chloride

(II) Lead (II) nitrate

(III) Ammonium chloride

(IV) Potassium sulphate

Which of the following is expected to occur?

A. White precipitate is formed in all cases.

B. White precipitate is formed with I, II and III only

C. White precipitate is formed with I and II only.

D. White precipitate is formed with I only

TOPIC: RADIOACTIVITY- NUCLEAR ENERGY

DIRECTION: Choose the correct answer from the lettered options.

1. The mass of a radioactive element is 346 grams after 2 hours the mass is 246 grams find the half-life of the element?

A. 4.1 per hour.

B. 1.386 per hour.

C. 5.9 per hour.

D. 0.35 per hour.

2. The half-life of an element is 24 hours. If an element has a mass of 36 g initially, what is the mass of the element after 96 hours?

A. 18 g.

B. 9 g.

C. 3 g.

D. 2.25 g.

3. Which of the following equations represents alpha particle radiation?

A. $^{238}_{92}U \Rightarrow {}^{234}_{90}Th + {}^{4}_{2}He$

B. $^{14}_{7}N + {}^{4}_{2}He \Rightarrow {}^{17}_{8}O + {}^{1}_{1}H$

C. $^{239}_{92}U \Longrightarrow {}^{239}_{93}Np + {}^{0}_{-1}e$

D. $^{13}_{7}N + {}^{4}_{2}He \Longrightarrow {}^{16}_{8}O + {}^{1}_{1}H$

4. Workers in radioactive laboratories are shielded from the harmful effects of radiation by using _____

A. thick lab coats.

B. thick blocks of lead.

C. cosmic rays in the lab.

D. non-radioactive pills daily after work.

5. _____ was the first scientist in 1896 to document the phenomenom of spontanoeus emitted radiation, which he later called 'radioactivity'.

A. Pierre and Marie Curie

B. Becquerel

C. Lord Rutherford

D. Gieger-Muller

6. Basic nuclear radiation was discovered by _____

A. Becquerel.

B. Marie Curie.

C. Geiger Muller.

D. Mardsen.

7. The equation given below;

$^{14}_{7}N + {}^{4}_{2}He \rightarrow {}^{17}_{8}O + {}^{1}_{1}P$ represents _____

A. nuclear fusion.

B. nuclear fission.

C. artificial radioactivity.

D. natural radioactivity.

8. The equation given below represents _____

$^{238}_{92}U \rightarrow {}^{234}_{90}Th + {}^{4}_{2}He$

A. gamma bombardment.

B. beta decay.

C. alpha decay.

D. artificial radioactivity.

9. The mass of a radioactive element is 400 grams and its half-life is 25 per second, what would be the mass of the radioactive element in 4 days?

A. 131.982 grams.

B. 131.982 days.

C. 5.260 grams.

D. 5.260 seconds.

10. 10g of a radioactive substance of half-life 30 mins is left in a cupboard at 8.00 a.m. 2.5 g of it will remain at _____

A. 10.30 a.m.

B. 10.00 a.m.

C. 9.30 a.m.

D. 9.00 a.m.

11. Lead (atomic number 82, mass number 210) will become bismuth (atomic number 83, mass number 210) by _____

A. emission of a β-particle.

B. emission of an α-particle.

C. emission of a positron.

D. capture of an α-particle.

12. When a radioactive substance spontaneously disintegrate with a change in atomic number and becomes a different element is called _____

A. nuclear change.

B. transfer of an atom.

C. transmutation of an atom.

D. none of the above.

13. One of the following is not amongst the main components of radioactive radiation.

A. Apha-rays.

B. X-rays.

C. Gamma-rays.

D. Beta-rays.

14. A large quantum of nuclear energy is derivable from _____

A. nuclear fusion using positions.

B. nuclear fusion using neutrons.

C. nuclear fission using neutrons.

D. nuclear fission using positions.

15. An alpha particle is _____

A. a hydrogen nucleus.

B. a neutron.

C. a positron.

D. a helium nucleus.

16. 100g of radioactive mass has a half-life of 5 days. Calculate the mass decayed off after 15 days.

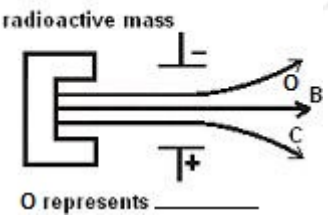
A. 25 g.

B. 50 g.

C. 12.5 g.

D. 6.25 g.

17. Radioactive mass



O represents _____

A. beta particles.

B. alpha particles.

C. gamma rays.

D. x-rays.

18. The following are characteristcs of radioactivity except _____

A. spontaneous and continuous emission of radioactive.

B. penetrative power of radioactive element, that is, can penetrate through opaque matter.

C. The rate of radiation is affected by temperature and pressure.

D. causes fluorescence in certain substances.

19. Radioactivity sets in a nucleus when the atomic number is _____

A. 10.

B. 30.

C. 50.

D. 80 and above.

20. What is nuclear fusion?

A. a process in which two or more heavy nuclei fuse to form light nucleus.

B. a process in which two or more heavy nuclei split to form small nucleus.

C. a process in which two or more light nuclei fuse to form heavier nucleus.

D. a process in which two or more light nuclei fuse to form neutrons.

21. Which of the following characteristics belong to one of the basic nuclear particles?

[i] Low penetrating.

[ii] Powerful ionizing power on gases

[iii] Particulate.

A. Alpha particles.

B. Beta particles.

C. Gamma rays.

D. X-ray

22. Which of these components of radioactive radiation has the highest penetrating power?

A. X-rays.

B. Alpha-rays.

C. Gamma-rays.

D. Beta-rays.

23. The mass of a radioactive element is 346 grams after 2 hours the mass is 246 grams find the decay constant?

A. 0.5 hour.

B. 0.171 hour.

C. 0.117 hour.

D. 2 hours.

24. A factor affecting rate of nuclear reactions is _____

A. pressure.

B. temperature.

C. catalyst.

D. charge on the bombarding particles.

25. What is radioactivity?

A. A phenomenon whereby substances emitt light rays.

B. A phenomenon whereby substances reduce in mass when used.

C. A phenomenon whereby substances fuse to form heavy substances.

D. A phenomenon whereby substances emitt radiation.

26. A process in which the nucleus of a heavy element is split into two nuclei of nearly equal mass with a release of energy is known as _____

A. half-life.

B. nuclear fission.

C. nuclear fusion.

D. radioactivity.

27. The half-life of an element X is 5 days. If we have 5g of X initially, what is the mass of X after 10 days?

A. 5 g.

B. 1.25 g.

C. 2.5 g.

D. 1 g.

28. Which of the following has the least ionization power?

A. Gamma-rays.

B. Beta-rays.

C. Alpha-rays.

D. X-rays.

29. The half-life of an element X is 5 days. If we have 5 g of X initially, what is the mass of X after 20 days?

A. 0.333 g.

B. 0.625 g.

C. 0.313 g.

D. 0.331 g.

30. What is the value of Z in the equation below?

$^{234}_{90}Th \rightarrow {}^{234}_{91}Pa + Z$

A. Alpha particle.

B. Beta particle.

C. X-ray.

D. Gamma ray.

31. Which of the following equations represents a Beta decay?

A. $^{238}_{92}U \Rightarrow ^{234}_{90}Th + ^{4}_{2}He$

B. $^{239}_{93}Np \Rightarrow ^{239}_{94}Pu + ^{0}_{-1}e$

C. $^{137}_{56}Ba \Rightarrow ^{137}_{56}Ba + r$

D. $^{14}_{7}N + ^{4}_{2}He \Rightarrow ^{17}_{8}O + ^{1}_{1}H$

32. The Radiation which all living things on the earth are exposed to but has no harmful effect because of its minuteness is called _____

A. small radiation.

B. x-ray.

C. background radiation.

D. none of the above

33. An important medical use of nuclear radiations is _____

A. activation analysis.

B. carbon dating.

C. radiotherapy.

D. tissue regeneration.

34. What is nuclear fission?

A. a process in which the nucleus of small element combines to form heavy nucleus.

B. a process in which the nucleus of small element splits to form protons.

C. a process in which the nucleus of heavy element splits to form neutrons.

D. a process in which the nucleus of heavy element splits to form small nucleus.

35. Radioisotopes have wide application in the following except _____

A. medicine.

B. industries.

C. agriculture.

D. weather forecast.

36. The following are electromagnetic waves except _____

A. gamma-rays.

B. x-rays.

C. beta-rays.

D. infra-red rays.

37. Which of the following is used in detecting radiation?

A. Geiger-Muller counter, diffusion cloud chamber and scintillation chamber.

B. Geiger-Muller counter, stereoscope and diffusion cloud chamber.

C. Scintillation chamber, Geiger-Muller counter and electroscope.

D. Diffusion cloud chamber, scintillation chamber and periscope.

38. Radioactive decay is expressed in terms of _____.

A. rate of radioactive absorption.

B. rate of radioactive stability.

C. position of element in the periodic table.

D. half-life.

39 $^{23}_{11}Na + D \longrightarrow {}^{24}_{11}N$

What is D?

A $^{1}_{1}n$.

B. $^{0}_{1}n$

C. $^{1}_{0}e$

D. $^{1}_{0}n$.

40. A certain radioactive nuclide has a half-life of 100 minutes. If a sample containing 1600 atoms is allowed to decay for 300 minutes, how many atoms of the radioactive nuclide will remain?

A. 100.

B. 200.

C. 400.

D. 600.

41. What is half-life of a radioactive isotope?

A. The minute it takes to gain half its radioactivity.

B. The time it takes to lose one-third its radioactivity.

C. The time it takes to gain half its radioactivity.

D. The time it takes to lose half its radioactivity.

42. What is the half-life of a radioactive element when the decay constant is 360 seconds?

A. 360 per seconds.

B. 19.25 per seconds.

C. 1.925 per seconds.

D. 0.001925 per seconds.

43. The energy released by a radioactive substance is called _____

A. chemical energy.

B. nuclear energy.

C. fission energy.

D. radioactive energy.

44. The half-life of an element P is 5 days. If the initial mass of P is 10g, what will be the mass in grams of P after 10 days?

A. 2.50.

B. 5.00.

C. 10.00.

D. 15.00.

45. The spontaneous disintegration of the nucleus of an atom is called _____

A. radioactive decay.

B. radioactivity.

C. nuclear emission.

D. nuclear fission.

46. What are the values of A and B in the given reaction below?

$^{210}_{82}Pb \rightarrow {}^{A}_{B}Bi + {}^{0}_{-1}$

A. 210, 80.

B. 210, 81.

C. 209, 83.

D. 210, 83.

47. What is emitted from the reaction given below?

$^{238}_{92}U \rightarrow {}^{234}_{90}Th + ?$

A. alpha particles.

B. beta particles.

C. gamma rays.

D. x-rays.

48. Beta rays are _____

A. negatively charged particles of negligible mass.

B. positively charged particles of negligible mass.

C. bundles of energy.

D. positively charged helium atoms.

49. What is artificial transmutation?

A. it is the disintegration of radioactive element to form a different element.

B. it is the emission of alpha particles.

C. it is the bombardment of element with moving atomic neutrons, protons, deuterons and alpha particles.

D. none of the above.

ANSWERS

TOPIC: CHEMISTRY OF EARTH AND SPACE

DIRECTION: Choose the correct answer from the lettered options.

1. How many moons does Jupiter have?

A. 8

B. 16

C. 15

D. 20

The correct answer is option [B]

2. The density of earth is _____.

A. 5.52g cm^{-3}

B. 5.10g cm^{-3}

C. 3.93g cm^{-3}

D. 5.44g cm^{-3}

The correct answer is option [A]

3. What planet is famous for the beautiful rings that surround it?

A. Saturn

B. Jupiter

C. Neptune

D. Uranus

The correct answer is option [A]

4. A galaxy is a huge collection of _____, _____ and _____.

A. planets, star and dust

B. planets, stars and gas

C. stars, gas, and sun

D. stars, gas and dust

The correct answer is option [D]

5. How many moons does Neptune have as at 2013?

A. 13

B. 15

C. 18

D. 20

The correct answer is option [A]

They are Triton, Nereid, Oroteus, Larissa, Galatea, Naiad, Thalassa, Despina, Sao, Psamathe, Neso, Halimede and Laomedeia.

6. _____ is observed when emitted light passes through a material that partially absorbs it before it is dispersed.

A. Adsorption spectra

B. Emission spectra

C. Absorption spectra

D. Thermionic spectra

The correct answer is option [C]

7. All planets revolve around the sun in the same direction and at the same time except _____.

A. earth

B. venus

C. mars

D. mercury

The correct answer is option [B]

8. A _____ is formed when a giant star collapses suddenly and explodes when the helium in its core are used up in fusion reactions.

A. supernova

B. big bang

C. explosion

D. milky way

The correct answer is option [A]

9. _____ is observed when light from a source undergoes dispersion directly.

A. Thermionic spectra

B. Light spectra

C. Emission spectra

D. Absorption spectra

The correct answer is option [C]

10. The solar atmosphere is composed of _____ layers.

A. 3

B. 4

C. 1

D. 2

The correct answer is option [D]

11. Which of the following is a frozen planet?

A. Earth.

B. Mars.

C. Mercury.

D. Pluto.

The correct answer is option [D].

12. What planet is known as the red planet?

A. Earth

B. Mars

C. Mercury

D. Venus

The correct answer is option [B]

13. Which of these options are two types of spectra?

(i) Emission and absorption spectra

(ii) Emission and adsorption spectra

(iii) Emission and light spectra

(iv) Absorption and thermionic spectra

A. (ii) only

B. (i) only

C. (iii) only

D. (iv) only

The correct answer is option [B]

14. The solar system is made up of _____.

A. The sun, asteroids, comets, meteoroids and the planets with their moons orbiting round it.

B. The sun, asteroids, comets, meteoroids, stars and the planets with their moons

C. The sun, asteroids, comets, meteoroids and the stars their moons orbiting round it.

D. The planets with their moons, asteroids and meteoroids

The correct answer is option [A]

15 The following options are constituents of the earth with the exception of _____.

A. lithosphere

B. atmosphere

C. hydrosphere

D. galaxy

16. The solar atmosphere is composed of a lower layer called _____ and higher layer called _____.

A. chromosphere, photosphere

B. corona, chromosphere

C. chromosphere, corona

D. photosphere, corona

The correct answer is option [C]

17. The earth is made up of _____.

(i) the atmosphere

(ii) the hydrosphere

(iii) the lithosphere

A. (i) & (ii) only

B. (i), (ii) & (iii)

C. (iii)

D. (ii) & (iii) only

The correct answer is option [B]

18. The layer of the atmosphere extending from about 10 to 17 km to about 45 km above the surface of the earth is known as _____.

A. stratosphere

B. troposphere

C. mesosphere

D. thermosphere

The correct answer is option [A]

19. The earth is a made up of _____ parts.

A. 2

B. 4

C. 3

D. 1

The correct answer is option [C]

20. The density of mercury is _____.

A. 5.10g cm^{-3}

B. 3.93g cm^{-3}

C. 5.44g cm^{-3}

D. 5.52g cm^{-3}

The correct answer is option [C]

21. The sun is a _____.

A. star

B. universe

C. planet

D. galaxy

The correct answer is option [A]

22. The region of the atmosphere extending from about 75 km to about 400 km is known as _____.

A. stratosphere

B. thermosphere

C. troposphere

D. mesosphere

The correct answer is option [B]

23. Which of the following options are the planets with the highest carbon (IV) oxide in the atmosphere?

A. Mercury and Venus

B. Mars and Earth

C. Venus and Mars

D. Mercury and Jupiter

The correct answer is option [C]

24. Ganymede is a moon of which planet?

A. Mercury

B. Venus

C. Earth

D. Jupiter

The correct answer is option [D]

25. The lower layer (up to about 10 km at the poles and about 17 km at the equator) above the earth's surface is known as the _____.

A. stratosphere

B. lithosphere

C. mesosphere

D. troposphere

The correct answer is option [D]

26. The outermost part of the lithosphere is called _____

A. atmosphere.

B. crust.

C. hydrosphere.

D. rock and soil.

The correct answer is option [D].

27. Stars are grouped according to _____ spectral classes.

A. 8

B. 6

C. 5

D. 7

The correct answer is option [D]

28. The ozone layer occurs in the _____ of the atmosphere.

A. troposphere

B. mesosphere

C. stratosphere

D. ionosphere

The correct answer is option [C]

29. The lithosphere is made up of _____, _____ and _____.

A. crust, rocks and core

B. crust, soil and core

C. crust, mantle and core

D. crust, mantle and gas

The correct answer is option [C]

30. The largest planet is _____.

A. earth

B. pluto

C. jupiter

D. mars

The correct answer is option [C]

31. Which planet has the highest moons rotating around it?

A. Uranus

B. Earth

C. Jupiter

D. Saturn

The correct answer is option [D]

32. Which of the planets are known as terrestrial planets?

A. Mercury, Venus, Earth and Mars.

B. Mercury, Jupiter, Earth and Mars.

C. Mercury, Venus, Earth and Saturn.

D. Mercury, Earth, Mars and Uranus.

The correct answer is option [A]

33. What is the name of the second biggest planet in our solar system?

A. Uranus

B. Neptune

C. Jupiter

D. Saturn

The correct answer is option [D]

34. _____ is used in the study of planets and stars.

A. Spectroscopy

B. Electron microscope

C. Radioactivity

D. Neutrino

The correct answer is option [A]

35. In the solar system, the largest planet is _____

A. earth.

B. jupiter.

C. mercury.

D. pluto.

The correct answer is option [B].

TOPIC: CHEMISTRY, INDUSTRY AND THE ENVIRONMENT

DIRECTION: Choose the correct answer from the lettered options.

1. The furnace in which glass is melted is _____.

A. blast furnace

B. tank furnace

C. solvay process

D. open hearth furnace

The correct answer is option [A]

Bauxite is an ore containing hydrated aluminium oxide, iron (III) oxide and silicon dioxide. In order to obtain a purer form of aluminium oxide bauxite is heated with a 10% solution of sodium hydroxide in which the aluminium oxide dissolves.

2. Write an equation for the reaction of aluminium oxide with sodium hydroxide.

A. $Al_2O_3 + 2OH^- \rightarrow 2[Al(OH)_4]^-$

B. $Al_2O + 2OH^- + 3H_2O \rightarrow 2[Al(OH)_4]^-$

C. $Al_2O_3 + 2OH^- + 3H_2O \rightarrow 2[Al(OH)_4]^-$

D. $Al_2O_3 + 2OH^- + H_2O \rightarrow [Al(OH)_4]^-$

The correct answer is option [C]

3. Fine chemicals have the following characteristics except _____.

A. they are chemically pure

B. they are produced by batch process

C. they are produced in large quantity because of high applicability

D. they are produced in small quantity because of limited applicability

The correct answer is option [C]

4. Urea, Ammonium nitrate and Ammonium sulphate are examples of _____.

A. nitrogenous fertilizers

B. potassium fertilizers

C. phosphate fertilizers

D. sulphate fertilizers

The correct answer is option [A]

5. The plastic industry is divided into _____ categories.

A. 3

B. 2

C. 4

D. 1

The correct answer is option [C]

6. Polypropylene and polystene belongs to _____.

A. thermoplastic

B. thermosetting plastic

C. cold setting plastic

D. warm setting plastic

The correct answer is option [A]

7. The substances added to the soil to provide one or more nutrients are called _____.

A. growth harmonies

B. minerals

C. fertilizers

D. none of the above

The correct answer is option [C]

8. Artificial or mineral fertilizers generally contain _____.

A. N, P or K

B. N, P or H

C. C, H and O

D. C, H and N

The correct answer is option [A]

9. Which of the following is a gaseous pollutant of the air?

A. Oxygen

B. Nitrogen

C. Sulphur (iv) oxide

D. Carbon (iv) oxide

The correct answer is option [C].

10. The four main sources of raw materials for the plastiics and synthetic organic chemical industries are _____, _____, _____ and _____

A. coal, limestone, glucose and malt

B. coke, lime, cellulose and malt

C. coal, limestone, cellulose and molasses

D. coke, lime, glucose and molasses

The correct answer is option [C]

Bauxite is an ore containing hydrated aluminium oxide, iron (III) oxide and silicon dioxide. In order to obtain a purer form of aluminium oxide bauxite is heated with a 10% solution of sodium hydroxide in which the aluminium oxide dissolves.

11. Why does iron (III) oxide not dissolve in sodium hydroxide?

A. Iron (III) oxide is an acidic oxide

B. Iron (III) oxide is an basic oxide

C. Iron (III) oxide is an neutral oxide

D. Iron (III) oxide is an amphoteric oxide

The correct answer is option [B]

12. White lead is a pigment with formula _____.

A. $PbCO_3$

B. $Pb(OH)_2$

C. $Pb(OH)_2.2PbCO_3$

D. Pb_3O_4

The correct answer is option [C]

13. Fertilizers maintain the pH of soil at one of these ranges;

A. from pH 7 to 8.

B. at pH 7.

C. above pH 10.

D. below pH 3.

The correct answer is option [A]

14. Acidic industrial waste can be treated with _____

A. lime.

B. brine.

C. water.

D. ethanol.

The correct answer is option [A].

15. Plastics are classified into _____.

A. two main types

B. three main types

C. four main types

D. none of the above

The correct answer is option [A]

16. A paint is usually composed of _____.

A. binder

B. pigments

C. thinner or solvents

D. all of the above

The correct answer is option [D]

17. Examples of heavy chemicals include the following except _____.

A. NaOH

B. perfumes

C. H_2SO_4

D. NH_3

The correct answer is option [B]

18. The major raw materials in a plastic industry is _____

A. ethanol.

B. sulphur.

C. methylethanoate.

D. ethene.

The correct answer is option [D].

19. Wash and wear clothes are manufactured using _____.

A. terylene fiber

B. nylon fider

C. wool fiber

D. cotton missed with water

The correct answer is option [A]

20. The best phosphate fertilizer containing high percentage of assailable P2O5 is _____.

A. double phosphate

B. super phosphate

C. triple phosphate

D. phosphorite

The correct answer is option [C]

21. Ceramics have the following characteristics except _____.

A. amenable to corrosion since they are of earthly impurities

B. heat and chemical resistant

C. it withstands stress

D. they are strong and durable

The correct answer is option [A]

22. The hydrophobic part of detergent molecule is _____.

A. water attracting

B. water repelling

C. both A & B

D. none of the above

The correct answer is option [B]

23. Which of the following is not a polymer?

A. Rubber

B. Cellulose

C. Fructose

D. Protein

The correct answer is option [C]

24. Cellulose acetate is _____.

A. a semi-synthetic fiber

B. a natural fiber

C. lies between a semi and true synthetic fiber

D. a true-synthetic fiber

The correct answer is option [C]

25. Which of the following is a thermosetting plastic?

A. Bakelite

B. Polyethylene

C. Polystyrene

D. None of the above

The correct answer is option [A]

26. Hydrophobic part of detergents readily dissolves in _____.

A. water

B. grease

C. both A & B

D. none of the above

The correct answer is option [B]

27. Plastics are _____.

A. synthetic polymer

B. solvents

C. acids

D. salts

The correct answer is option [A]

28. A cement factory is usually sited near a commercial deposit of _____

A. $Al_2(SO_4)_3$.

B. $CaCO_3$.

C. FeS.

D. $MgCO_3$.

The correct answer is option [B].

29. Crude oil spillage on a river can be dispersed by spraying the water with _____.

(I) disinfectant

(II) kerosene.

(III) petrol.

(IV) detergent.

A. IV.

B. III & IV.

C. I, II & III.

D. I, II, III & IV.

The correct answer is option [A].

30. Which of the following is a pollutant in drinking water even in trace amounts?

A. $Ca^{2+.}$

B. $Hg^{2+.}$

C. $Mg^{2+.}$

D. $Fe^{2+.}$

The correct answer is option [B].

31. A plastic which cannot be softened by heat is described as _____

A. thermosetting.

B. non-biodegradable.

C. thermoplastic.

D. malleable.

The correct answer is option [A].

32. _____ are sodium and potassium salts of long chain fatty acids.

A. Soaps

B. Detergents

C. Esters

D. Fertilizers

The correct answer is option [A]

33. Which part of the chemical industry manufactures drugs and medicines?

A. Petrochemical.

B. Plastics.

C. Pharmaceutical.

D. Dyestuffs.

The correct answer is option [C].

34. Paints and varnishes are manufactured in many factories in _____.

A. Karachi

B. Lahore

C. Hyderabad

D. All of the above

The correct answer is option [D]

35. The temperature at which PVC is formed is _____.

A. 80°C

B. 20°C

C. 50°C

D. 100°C

The correct answer is option [A]

36. _____ is defined as one that uses chemistry to make chemicals from other chemical substances.

A. Fine chemicals

B. Chemical industry

C. Heavy chemicals

D. Fertilizers

The correct answer is option [B]

37. Fertilizers that are derived from plants and animals are called _____.

A. artificial fertilizers

B. natural fertilizers

C. synthetic fertilizers

D. organic fertilizers

The correct answer is option [B]

38. Which is not a natural polymer?

A. Silk

B. Wool

C. Leather

D. Nylon

The correct answer is option [D]

39. Bakelite plastic is formed by the combination of _____.

A. form aldehyde and phenol

B. acet aldehyde and phenol

C. benz aldehyde and phenol

D. acetone and phenol

The correct answer is option [A]

Ammonia is manufactured from hydrogen and nitrogen in the Haber Process:

$N_2(g) + 3H_2(g) \rightleftarrows 2NH_3(g)$ $\Delta H = -92$ KJ mol-1

40. What is meant by the term dynamic equilibrium?

A. Reacts at both directions and at equal rates.

B. Reacts in one direction.

C. Reacts at equal rates.

D. Reacts at different directions and at equal rates.

The correct answer is option [A]

41. A consequence of global warming is _____

A. flooding.

B. air pollution.

C. water pollution.

D. increased humidity.

The correct answer is option [A].

42. The following are divisions of chemical industries except _____

A. cement.

B. plastic.

C. pharmaceutical.

D. block.

The correct answer is option [D].

43. A varnish may be regarded as _____.

A. unpigment colloidal dispersion

B. solution of natural resin

C. solution of synthetic resin

D. all of the above

The correct answer is option [A]

44. The major difference between cement and mortar is that _____.

A. mortar is always white

B. cement hardens by giving off water

C. mortar hardens by giving off water

D. cement is always coloured because of superheating

The correct answer is option [C]

45. Which of the following gases is the most dangerous pollutant?

A. Hydrogen sulphide.

B. Carbon (IV) oxide.

C. Sulphur (IV) oxide.

D. Carbon (II) oxide.

The correct answer is option [D].

46. Widely used thinner in paints is _____.

A. water

B. kerosene oil

C. linseed oil

D. turpentine oil

The correct answer is option [D]

47. Which of the following compound gives green colour to glass?

A. CuO

B. Cr_2O_3

C. CoO

D. ZnO

The correct answer is option [B]

48. The substances which boost up the power of detergents are called _____.

A. stabilizers

B. builders

C. surfactants

D. additive

The correct answer is option [C]

49. The following are heavy chemicals except _____.

A. tetraoxosulphate (vi) acid

B. dyes

C. sodium trioxocarbonate (iv)

D. ethene

The correct answer is option [B].

50. The following option are examples of heavy chemicals except _____.

A. sodium hydroxide

B. ammonia

C. hydrogentetraoxosulphate (VI) acid

D. hydrogen chloride

The correct answer is option [D]

51. These are examples of chemical industries except _____.

A. photosynthesis

B. solvay process

C. electrolysis of brine

D. contact process

The correct answer is option [A]

52. The production of plastics involves these conditions with the exception of _____.

A. high temperature

B. low temperature

C. high pressure

D. setting

The correct answer is option [B]

53. The monomer of PVC is _____.

A. succinic acid

B. vinyl chloride

C. propylene

D. glycol

The correct answer is option [B]

54. Which of the following substances cannot be classified as a heavy chemical?

A. $AgNO_3$.

B. CaO.

C. $CaOCl_2$.

D. H_2SO_4.

The correct answer is option [A].

55. Which of the following pollutants is biodegradable?

A. Sewage.

B. Plastics.

C. Metal scraps.

D. Lead compounds.

The correct answer is option [A].

56. Waste plastics accumulate in the soil and pollute the environment because plastic materials are _____

A. insoluble in water.

B. non-biodegradable.

C. easily affected by heat.

D. inflammable.

The correct answer is option [B].

57. Chrome yellow is a pigment with formula _____

A. Pb_3O_4

B. $PbCrO_4$

C. K_2CrO_4

D. $MnCrO_4$

The correct answer is option [B]

58. Factors, which can contribute to environmental pollution, include _____

(I) overpopulation.

(II) chemical warfare.

(III) agricultural activities.

(IV) industrialization.

A. I & II.

B. III & IV.

C. I, II & III.

D. I, II, III & IV.

The correct answer is option [D].

59. Metallurgy is a scientific process which involves the following except _____.

A. manufacture of alloys

B. refining of metals

C. manufacture of both natural and artificial catalysts

D. grading of metals

The correct answer is option [C]

60. Detergents are better than soaps for laundering because _____.

A. detergents are synthetic while soaps are not

B. detergents are more soluble in water than soap

C. scum is precipitated when soaps are used with hard water but not detergents

D. soaps form soluble salts with ions causing hardness while detergents do not

The correct answer is option [C].

TOPIC: NON METALS AND THEIR COMPOUNDS

DIRECTION: Choose the correct answer from the lettered options.

1. Both the melting point and boiling point of Cl2 gas are very low. However it is very difficult to dissociate Cl2 molecules into Cl atoms. Which one of the following best explains these properties of chlorine?

A. The intramolecular bonding of Cl2 is weaker than the intermolecular bonding

B. The intramolecular bonding of Cl2 is stronger than the intermolecular bonding

C. The intramolecular bonding of Cl2 is identical to the intermolecular bonding.

D. Both Cl2 and Cl have weak dispersion (London) forces.

The correct answer is option [B].

2. Which of the following statements is not true?

A. Carbon exhibits allotropy

B. Sulphur exhibits allotropy

C. Chlorine exhibits allotropy

D. Nitrogen is a gas

The correct answer is option [C].

3. Which of the following gases will bleach moist litmus paper?

A. Cl_2.

B. CO_2.

C. SO_3.

D. HCl.

The correct answer is option [A].

4. Efflorescence substances are also _____

A. efflorescent.

B. anhydrous.

C. hydroscopic.

D. insoluble.

The correct answer is option [B].

5. Which of the following describes why water has an unusually high boiling temperature?

A. Water molecules have strong H-bonding.

B. The O-H bonds are broken up at the point of boiling.

C. The water molecule contains strong covalent bonds.

D. Water molecules have strong dispersion forces.

The correct answer is option [A].

6. Nitrogen is prepared on a large scale by the _____

A. fractional distillation of liquefied air.

B. decomposition of ammonium dioxonitrate (III).

C. electrolysis of brine.

D. Haber process.

The correct answer is option [A].

Nitrogen occupies 78% of air as a mixture of gases.

7. Which of the following processes are suitable for investigating whether or not a liquid is pure water?

(I) Testing it with anhydrous copper (II) tetraoxosulphate (IV).

(II) Testing it with cobalt (II) chloride paper.

(III) Testing it with iodine.

(IV) none of the above.

A. I & II.

B. III & IV.

C. I, II & III.

D. I, II, III & IV.

The correct answer is option [A]

8. Which of the following non-metals react readily with metals?

A. Nitrogen

B. Chlorine

C. Sulphur

D. Carbon

The correct answer is option [B].

9. When sodium reacts with water, the resulting solution is _____

A. weakly acidic.

B. neutral.

C. acidic.

D. alkaline.

The correct answer is option [D].

10. If sulphur is dissolved in carbon (IV) sulphide and the solution allowed to evaporate, the allotrope of sulphur formed is _____

A. plastic sulphur.

B. amorphous sulphur.

C. rhombic sulphur.

D. monoclinic sulphur.

The correct answer is option [C].

11. An acid anhydride is an oxide of a non-metal _____

A. which will not dissolve in water.

B. whose solution in water has a pH greater than 7.

C. whose solution in water has a pH less than 7.

D. whose solution in water has a pH of 7.

The correct answer is option [C].

12. Pipe-borne water is usually chlorinated in order to _____

A. improve the taste of the water.

B. remove the hardness in the water.

C. coagulate sediments in the water.

D. kill harmful bacteria.

The correct answer is option [D].

13. Which of the following is correct of the ammonia molecule?

A. It has a tetrahedral shape.

B. It has a lone pair of electron.

C. The N-H-N bond angle is 180 degree.

D. It is a non-polar molecule.

The correct answer is option [C].

14. Potassium tetraoxomanganate (VII) is often added to improve water to _____

A. reduce organic impurities.

B. reduce inorganic impurities.

C. destroy bacteria and algae.

D. remove permanent hardness.

The correct answer is option [C].

15. The halide used widely in photography is _____

A. silver bromide.

B. ammonium chloride.

C. calcium chloride.

D. sodium bromide.

The correct answer is option [C].

16. Which of the following is not used as a raw material in the Solvay process?

A. Ammonia

B. Sodium chloride

C. Calcium trioxocarbonate (IV)

D. Sodium trioxocarbonate (IV)

The correct answer is option [C].

Solvay process is an industrial method of producing Sodium Trioxo-Carbonate (IV) . It is otherwise called Ammonia Soda process.

17. Synthetic detergents are preferred to soap for laundry using hard water because _____

A. detergents are water soluble while soap is not.

B. the calcium salts of detergents are water soluble.

C. the magnesium salt of soap is soluble in hard water.

D. soap does not.

The correct answer is option [B].

18. The following are the uses of sulphur except in the _____.

A. manufacture of tetraoxosulphate (vi) acid

B. prevention of the growth of fungi

C. cooling of steel to prevent rusting

D. manufacture of dyes

The correct answer is option [C].

19. Oxygen can be produced by heating _____

A. ammonium trioxinitrate (V).

B. ammonium trioxinitrate (III).

C. potassium trioxo-chlorate (V).

D. magnesium (IV) oxide.

The correct answer is option [C].

$2KClO_3 \rightarrow 2KCl + 3O_2$

20. Which of the following is a water pollutant?

A. Fertilizer.

B. Human waste.

C. Industrial waste.

D. All of the above.

The correct answer is option [D].

21. Which of the following are produced when ammonium trioxonitrate (V) crystals are cautiously heated in a hard round-bottom glass flask?

A. N_2O and Steam.

B. NO_2 and Ammonia.

C. N_2O_4 and NO_2.

D. NO and NO_2.

The correct answer is option [B]

22. Which of the following can be obtained by fractional distillation?

A. Nitrogen from liquid air.

B. Sodium chloride from seawater.

C. Iodine from a solution of iodine in carbon tetrachlorate.

D. Sulphur from a solution of sulphur in carbon disulphide.

The correct answer is option [A].

23. What is the mass of one molecule of nitrogen gas N2?

A. $\frac{14.0}{2 \times 6.02 \times 10^{23}} g$

B. $\frac{14.0}{6.02 \times 10^{23}} g$

C. $\frac{2 \times 14.0}{6.02 \times 10^{23}} g$

D. 2 x 14.0 x 6.02 x 1023 g.

The correct answer is option [C].

24. Ammonia decomposes at temperatures above 500oC to yield _____

A. urine.

B. nitrogen dioxide.

C. ammonium.

D. ammonium chloride.

The correct answer is option [C].

25. Helium is preferred to hydrogen in filling balloons because hydrogen is _____

A. inflammable.

B. diatomic.

C. an isotopy.

D. a component of water.

The correct answer is option [A].

26. Amphoteric oxides are oxides which _____

A. react with water to form oxides.

B. react with water to form alkali.

C. show neither acidic nor basic properties.

D. react with acids and alkali.

The correct answer is option [D].

27. Which of the following will decrease in mass when heated in air?

(I) Magnesium ribbon.

(II) Powdered sulphur.

(III) Calcium trioxocarbonate (IV).

(IV) Magnesium tetraoxosulphate (IV) heptahydrate.

A. I & II.

B. III & IV.

C. I, II & III.

D. I, II, III & IV.

The correct answer is option [D].

28. In the Haber process for the manufacture of Ammonia, the catalyst commonly used is finely divided _____

A. vanadium.

B. platinum.

C. iron.

D. copper.

The correct answer is option [C].

29. Sulphur exists in six forms in the solid state. This property is known as _____

A. isomerism.

B. allotropy.

C. isotopy.

D. isomorphism.

The correct answer is option [B].

30. Which of the following oxides of nitrogen is unstable in air?

A. NO_2

B. NO

C. N_2O_4

D. N_2O_5

The correct answer is option [D].

31. Which one of the following statements best describes the unusually high boiling point of water?

A. The covalent O-H bond in water is very strong.

B. The dipole-dipole intermolecular forces between water molecules are strong

C. Water consists of H+and OH- ions.

D. Water molecules interact with each other through very strong London dispersion forces.

The correct answer is option [B].

32. Which of the following solids is a molecular substance?

A. Copper.

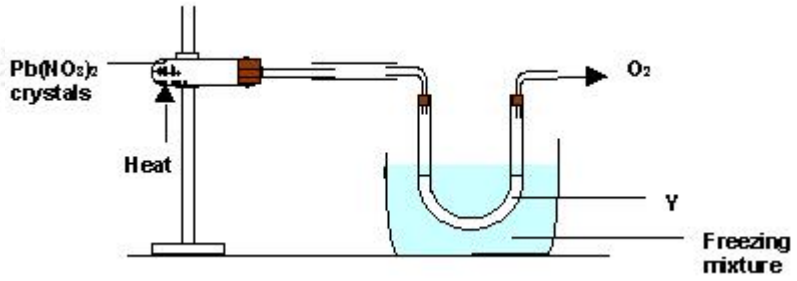
B. Diamond.

C. Phosphorus.

D. Sodium chloride.

The correct answer is option [C].

33. In the diagram, Y is _____.



A. NO_2

B. N_2O_5

C. N_2O_4

D. NO

The correct answer is option [A].

It is the setup of an experiment for the production of Nitrogen (IV) Oxide.

34. Which of the following best describes the forces that allow nitrogen to condense to the liquid state?

A. Covalent bonding.

B. Hydrogen bonding.

C. Intermolecular bonding.

D. Intramolecular bonding.

The correct answer is option [C].

35. The addition of water to calcium oxide leads to _____

A. a physical change.

B. a chemical change.

C. the formation of a mixture.

D. an endothermic reaction.

The correct answer is option [B].

It leads to the formation of Calcium Hydroxide. (Slake Lime). $CaO + H_2O \rightarrow Ca(OH)2$ which is a chemical change.

36. Chlorine gas turns a damp starch iodide paper into _____

A. dark blue.

B. pink.

C. orange.

D. red.

The correct answer is option [A].

This is a major laboratory test for Chlorine gas.

37. Causes of hardness of water include the presence of _____

A. calcium tetraoxosulphate (VI).

B. magnesium tetraoxosulphate (VI).

C. calcium hydrogen trioxocarbonate (VI).

D. all of the above.

The correct answer is option [D].

38. A positive brown ring test indicates the presence of _____

A. NO_3.

B. Fe^{3+}.

C. SO_2^{-3}.

D. Cu.

The correct answer is option [A].

39. Chlorine, bromine and iodine resemble one another in that they _____

A. dissolve in alkalis.

B. react violently with hydrogen without heating.

C. are liquids.

D. displace one another from solutions of their salts.

The correct answer is option [D].

40. Gases which are used as cooling agents include _____

(I) nitrogen.

(II) ammonia.

(III) benzene.

(IV) oxygen.

A. I & II.

B. III & IV.

C. I, II & III.

D. I, II, III & IV.

The correct answer is option [B].

41. To study solubilities, a solution of sodium sulphate is added to a solution of each of the following compounds:

(I) Barium chloride

(II) Lead (II) nitrate

(III) Ammonium chloride

(IV) Potassium sulphate

Which of the following is expected to occur?

A. White precipitate is formed in all cases.

B. White precipitate is formed with I, II and III only

C. White precipitate is formed with I and II only.

D. White precipitate is formed with I only

The correct answer is option [C]

TOPIC: RADIOACTIVITY- NUCLEAR ENERGY

DIRECTION: Choose the correct answer from the lettered options.

1. The mass of a radioactive element is 346 grams after 2 hours the mass is 246 grams find the half-life of the element?

A. 4.1 per hour.

B. 1.386 per hour.

C. 5.9 per hour.

D. 0.35 per hour.

The correct answer is option [A].

Solution: Using the equation: N = Noe(-λt), where N = final mass = 246 grams, No = original mass = 346 grams, t = time of decay = 2 hours. Therefore decay constant λ = ln (246/346)/2 = 0.171 hour. The half-life is t1/2 = 0.693/0.171 = 4.1 per hour.

2. The half-life of an element is 24 hours. If an element has a mass of 36 g initially, what is the mass of the element after 96 hours?

A. 18 g.

B. 9 g.

C. 3 g.

D. 2.25 g.

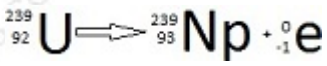
The correct answer is option [D].

Solution: half-life of the element is 24 hours, which is 1/2, another 48 hours is/$_2$, another 48 hours is $^1/_2$ x $^1/_2$ = $^1/_4$, another 72 hours is $^1/_2$ x $^1/_2$ x $^1/_2$ = $^1/_8$, another 96 hours is $^1/_2$ x $^1/_2$ x $^1/_2$ x $^1/_2$ = $^1/_{16}$. Therefore the mass after 96 hours is $^1/_{16}$ x 36 = 2.25 g.

3. Which of the following equations represents alpha particle radiation?

A. $^{238}_{92}U \Rightarrow {}^{234}_{90}Th + {}^{4}_{2}He$

B. $^{14}_{7}N + {}^{4}_{2}He \Rightarrow {}^{17}_{8}O + {}^{1}_{1}H$

C. 

D. 

The correct answer is option [A].

4. Workers in radioactive laboratories are shielded from the harmful effects of radiation by using _____

A. thick lab coats.

B. thick blocks of lead.

C. cosmic rays in the lab.

D. non-radioactive pills daily after work.

The correct answer is option [B].

5. _____ was the first scientist in 1896 to document the phenomenom of spontanoeus emitted radiation, which he later called 'radioactivity'.

A. Pierre and Marie Curie

B. Becquerel

C. Lord Rutherford

D. Gieger-Muller

The correct answer is option [B].

6. Basic nuclear radiation was discovered by _____

A. Becquerel.

B. Marie Curie.

C. Geiger Muller.

D. Mardsen.

The correct answer is option [A].

7. The equation given below;

$^{14}_{7}N + {}^{4}_{2}He \rightarrow {}^{17}_{8}O + {}^{1}_{1}P$ represents _____

A. nuclear fusion.

B. nuclear fission.

C. artificial radioactivity.

D. natural radioactivity.

The correct answer is option [C].

8. The equation given below represents _____

$^{238}_{92}U \rightarrow {}^{234}_{90}Th + {}^{4}_{2}He$

A. gamma bombardment.

B. beta decay.

C. alpha decay.

D. artificial radioactivity.

The correct answer is option [C].

9. The mass of a radioactive element is 400 grams and its half-life is 25 per second, what would be the mass of the radioactive element in 4 days?

A. 131.982 grams.

B. 131.982 days.

C. 5.260 grams.

D. 5.260 seconds.

The correct answer is option [A].

Solution: Using the equation: Using the equation: $N = N_o e^{-\lambda t}$, where N = final mass, N_o = original mass, λ = decay constant = $^{0.693}/_{t^1/_2}$ and $t^1/_2$ = 25 per seconds, t = time to decay = 4 days. Therefore, $N = 400 \times e^{(-0.02772 \times 4)}$ = 131.982 grams.

10. 10g of a radioactive substance of half-life 30 mins is left in a cupboard at 8.00 a.m. 2.5 g of it will remain at _____

A. 10.30 a.m.

B. 10.00 a.m.

C. 9.30 a.m.

D. 9.00 a.m.

The correct answer is option [D].

Solution: Using the equations $t^{1}/_{2} = {}^{0.693}/_{\lambda}$, where $t^{1}/_{2}$ = 30 mins and $N = N_o e^{-\lambda t}$, where N = 2.5 g, N_o = 10 g, t = ?, $\lambda = {}^{0.693}/_{30}$ = 0.0231 $mins^{-1}$; ln $^{2.5}/_{10}$ = -0.231t; t = $^{1.3863}/_{0.0231}$ = 60.013 mins ≈ 60 mins = 1 hr. Therefore the time 2.5 g will remain is 8.00 + 1.00 = 9.00 a.m.

11. Lead (atomic number 82, mass number 210) will become bismuth (atomic number 83, mass number 210) by _____

A. emission of a β-particle.

B. emission of an α-particle.

C. emission of a positron.

D. capture of an α-particle.

The correct answer is option [A].

12. When a radioactive substance spontaneously disintegrate with a change in atomic number and becomes a different element is called _____

A. nuclear change.

B. transfer of an atom.

C. transmutation of an atom.

D. none of the above.

The correct answer is option [C].

13. One of the following is not amongst the main components of radioactive radiation.

A. Apha-rays.

B. X-rays.

C. Gamma-rays.

D. Beta-rays.

The correct answer is option [B].

14. A large quantum of nuclear energy is derivable from _____

A. nuclear fusion using positions.

B. nuclear fusion using neutrons.

C. nuclear fission using neutrons.

D. nuclear fission using positions.

The correct answer is option [B].

15. An alpha particle is _____

A. a hydrogen nucleus.

B. a neutron.

C. a positron.

D. an helium nucleus.

The correct answer is option [D].

16. 100g of radioactive mass has a half-life of 5 days. Calculate the mass decayed off after 15 days.

A. 25 g.

B. 50 g.

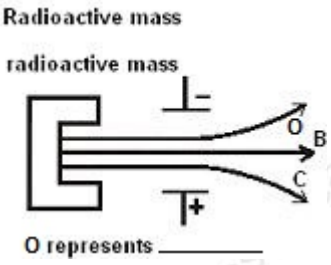
C. 12.5 g.

D. 6.25 g.

The correct answer is option [C].

Solution: half-life of a radioactive element is 5 days, which is $^1/_2$, another 5 days is $^1/_2$ x $^1/_2$ = $^1/_4$, another 5 days is $^1/_2$ x $^1/_2$ x $^1/_2$ = $^1/_8$ x 100 = 12.5 g.

17.



A. beta particles.

B. alpha particles.

C. gamma rays.

D. x-rays.

The correct answer is option [B].

18. The following are characteristics of radioactivity except _____

A. spontaneous and continuous emission of radioactive.

B. penetrative power of radioactive element, that is, can penetrate through opaque matter.

C. The rate of radiation is affected by temperature and pressure.

D. causes fluorescence in certain substances.

The correct answer is option [C].

19. Radioactivity sets in a nucleus when the atomic number is _____

A. 10.

B. 30.

C. 50.

D. 80 and above.

The correct answer is option [D].

20. What is nuclear fusion?

A. a process in which two or more heavy nuclei fuse to form light nucleus.

B. a process in which two or more heavy nuclei split to form small nucleus.

C. a process in which two or more light nuclei fuse to form heavier nucleus.

D. a process in which two or more light nuclei fuse to form neutrons.

The correct answer is option [C].

21. Which of the following characteristics belong to one of the basic nuclear particles?

[i] Low penetrating.

[ii] Powerful ionizing power on gases

[iii] Particulate.

A. Alpha particles.

B. Beta particles.

C. Gamma rays.

D. X-ray

The correct answer is option [A].

22. Which of these components of radioactive radiation has the highest penetrating power?

A. X-rays.

B. Alpha-rays.

C. Gamma-rays.

D. Beta-rays.

The correct answer is option [C].

23. The mass of a radioactive element is 346 grams after 2 hours the mass is 246 grams find the decay constant?

A. 0.5 hour.

B. 0.171 hour.

C. 0.117 hour.

D. 2 hours.

The correct answer is option [B].

Solution: Using the equation: $N = N_o e^{(-\lambda t)}$, where N = final mass = 246 grams, N_o = original mass = 346 grams, t = time of decay = 2 hours. Therefore decay constant $\lambda = {}^{\ln (246/346)}/_{2}$ = 0.171 hour.

24. A factor affecting rate of nuclear reactions is _____

A. pressure.

B. temperature.

C. catalyst.

D. charge on the bombarding particles.

The correct answer is option [D].

25. What is radioactivity?

A. A phenomenon whereby substances emit light rays.

B. A phenomenon whereby substances reduce in mass when used.

C. A phenomenon whereby substances fuse to form heavy substances.

D. A phenomenon whereby substances emit radiation.

The correct answer is option [D].

26. A process in which the nucleus of a heavy element is split into two nuclei of nearly equal mass with a release of energy is known as _____

A. half-life.

B. nuclear fission.

C. nuclear fusion.

D. radioactivity.

The correct answer is option [B].

27. The half-life of an element X is 5 days. If we have 5g of X initially, what is the mass of X after 10 days?

A. 5 g.

B. 1.25 g.

C. 2.5 g.

D. 1 g.

The correct answer is option [B].

Solution: half-life of X is 5 days, which is. $^1/_2$, another 10 days is $^1/_2$ x $^1/_2$ = $^1/_4$ x 5 g = 1.25 g.

28. Which of the following has the least ionization power?

A. Gamma-rays.

B. Beta-rays.

C. Alpha-rays.

D. X-rays.

The correct answer is option [A].

29. The half-life of an element X is 5 days. If we have 5 g of X initially, what is the mass of X after 20 days?

A. 0.333 g.

B. 0.625 g.

C. 0.313 g.

D. 0.331 g.

The correct answer is option [C].

Solution: half-life of X is 5 days, which is $^1/_2$, another 5 days is $^1/_2 \times {}^1/_2 = {}^1/_4$, another 5 days is $^1/_2 \times {}^1/_2 \times {}^1/_2 = {}^1/_8$, another 5 days is $^1/_2 \times {}^1/_2 \times {}^1/_2 \times {}^1/_2 = {}^1/_{16} \times 5 = 0.313$ g.

30. What is the value of Z in the equation below?

$^{234}_{90}Th \rightarrow {}^{234}_{91}Pa + Z$

A. Alpha particle.

B. Beta particle.

C. X-ray.

D. Gamma ray.

The correct answer is option [B].

31. Which of the following equations represents a Beta decay?

A. $^{238}_{92}U \Rightarrow {}^{234}_{90}Th + {}^{4}_{2}He$

B. $^{239}_{93}Np \Rightarrow {}^{239}_{94}Pu + {}^{0}_{-1}e$

C. $^{137}_{56}Ba \Rightarrow {}^{137}_{56}Ba + r$

D. $^{14}_{7}N + {}^{4}_{2}He \Rightarrow {}^{17}_{8}O + {}^{1}_{1}H$

The correct answer is option [B].

32. The Radiation which all living things on the earth are exposed to but has no harmful effect because of its minuteness is called _____

A. small radiation.

B. x-ray.

C. background radiation.

D. none of the above

The correct answer is option [C].

33. An important medical use of nuclear radiations is _____

A. activation analysis.

B. carbon dating.

C. radiotherapy.

D. tissue regeneration.

The correct answer is option [C].

34. What is nuclear fission?

A. a process in which the nucleus of small element combines to form heavy nucleus.

B. a process in which the nucleus of small element splits to form protons.

C. a process in which the nucleus of heavy element splits to form neutrons.

D. a process in which the nucleus of heavy element splits to form small nucleus.

The correct answer is option [D].

35. Radioisotopes have wide application in the following except _____

A. medicine.

B. industries.

C. agriculture.

D. weather forecast.

The correct answer is option [D].

36. The following are electromagnetic waves except _____

A. gamma-rays.

B. x-rays.

C. beta-rays.

D. infra-red rays.

The correct answer is option [C].

37. Which of the following is used in detecting radiation?

A. Geiger-Muller counter, diffusion cloud chamber and scintillation chamber.

B. Geiger-Muller counter, stereoscope and diffusion cloud chamber.

C. Scintillation chamber, Geiger-Muller counter and electroscope.

D. Diffusion cloud chamber, scintillation chamber and periscope.

The correct answer is option [A].

38. Radioactive decay is expressed in terms of _____.

A. rate of radioactive absorption.

B. rate of radioactive stability.

C. position of element in the periodic table.

D. half-life.

The correct answer is option [D].

39 $^{23}_{11}Na + D \longrightarrow {}^{24}_{11}N$

What is D?

A $^{1}_{1}n$.

B. $^{0}_{1}n$

C. $^{1}_{0}e$

D. $^{1}_{0}n$.

The correct answer is option [D].

40. A certain radioactive nuclide has a half-life of 100 minutes. If a sample containing 1600 atoms is allowed to decay for 300 minutes, how many atoms of the radioactive nuclide will remain?

A. 100.

B. 200.

C. 400.

D. 600.

The correct answer is option [B].

41. What is half-life of a radioactive isotope?

A. The minute it takes to gain half its radioactivity.

B. The time it takes to lose one-third its radioactivity.

C. The time it takes to gain half its radioactivity.

D. The time it takes to lose half its radioactivity.

The correct answer is option [D].

42. What is the half-life of a radioactive element when the decay constant is 360 seconds?

A. 360 per seconds.

B. 19.25 per seconds.

C. 1.925 per seconds.

D. 0.001925 per seconds.

The correct answer is option [D].

Solution: $t^1/_2 = {}^{0.693}/_{\lambda}$, where $\lambda = 360$ seconds. Therefore, $t^1/_2 = {}^{0.693}/_{360} = 0.001925$/seconds or 0.001925 per seconds.

43. The energy released by a radioactive substance is called _____

A. chemical energy.

B. nuclear energy.

C. fission energy.

D. radioactive energy.

The correct answer is option [B].

44. The half-life of an element P is 5 days. If the initial mass of P is 10g, what will be the mass in grams of P after 10 days?

A. 2.50.

B. 5.00.

C. 10.00.

D. 15.00.

The correct answer is option [A

. Using the equation
$N = N_o e^{-lt}$
where N = final mass of P
N_o = original mass of P
l = decay constant
t = time for P to decay

45. The spontaneous disintegration of the nucleus of an atom is called _____

A. radioactive decay.

B. radioactivity.

C. nuclear emission.

D. nuclear fission.

The correct answer is option [B].

46. What are the values of A and B in the given reaction below?

$^{210}_{82}Pb \rightarrow {}^{A}_{B}Bi + {}^{0}_{-1}$

A. 210, 80.

B. 210, 81.

C. 209, 83.

D. 210, 83.

The correct answer is option [D].

47. What is emitted from the reaction given below?

$^{238}_{92}U \rightarrow {}^{234}_{90}Th$ +?

A. alpha particles.

B. beta particles.

C. gamma rays.

D. x-rays.

The correct answer is option [A].

48. Beta rays are _____

A. negatively charged particles of negligible mass.

B. positively charged particles of negligible mass.

C. bundles of energy.

D. positively charged helium atoms.

The correct answer is option [A].

49. What is artificial transmutation?

A. it is the disintegration of radioactive element to form a different element.

B. it is the emission of alpha particles.

C. it is the bombardment of element with moving atomic neutrons, protons, deuterons and alpha particles.

D. none of the above.

The correct answer is option [C].