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PRELIMS 90 DAYS -90 MINUTE TEST SERIES (75 Questions).

TEST 1 -BASIC SCIENCE R3051 (2017)

Time Allowed: 90 Minutes **Maximum Marks:150**

INSTRUCTIONS

1. Immediately After The Commencement Of The Examination, You Should Check That This Booklet Does Not Have Any Unprinted Or Turn Or Missing Pages Or Items, Etc. If So, Get It Replaced By A Complete Test Booklet.
2. This Test Booklet contains 75 Questions. Each item is printed in English.
3.. You have to mark all your responses ONLY on the separate Answer Sheet provided.
4. After you have completed filling in all responses on the answer sheet and the examination has concluded, you should hand over to Invigilator only the answer sheet. You are permitted to take away with you the Test Booklet.
5. All items carry equal marks. Your total marks will depend on the number of correct responses marked by you in the answer sheet. For every wrong response 1/3rd of the allotted marks will be deducted.
6. Penalty for wrong answers :

There Will Be Penalty For Wrong Answers Marked By A Candidate In The Objective Type Question Papers.

(i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, one-third of the marks assigned to that question will be deducted as penalty.
(ii) If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct and there will be same penalty as above to that question.
(iii) If a question is left blank or no answer is given by the candidate,there wont be any penalty for that question.

DO NOT OPEN THIS BOOKLET UNTIL YOU ARE ASKED TO DO SO

1. Consider the following statements with reference to the periodic table of chemical elements:

1. ionisation energy gradually decreases along a period.
2. In a group of elements,electron affinity decreases as the atomic weight increases.
3. In a given period,atomic radious decreases as the atomic number increases.

Which of these statements is/are correct?
(a) 1 only
(b) 2 only
(c) 1 and 3 nly
(d) 1 and 2 only

2. Consider the following statements:
Asserion (A): O Blood group is considered as universal donor.
Reason (R): A and B antibody are present in the plasma are present in O group.

(a) Both A and R are true & R is correct explanation of A
(b) Both A and R are true but R is not correct explanation of A
(c) A is true But R is false
(d) A is false but R is true

3. Arrange the following stages of star life cycle in the ascending order.

1.NEBULA
2.RED GIANT
3.RED DWARF
4.WHITE DWARF
5.SUPERNOVA
6.BLACK HOLES

Choose from options below:
(a) 1-3-5-2-4-6
(b) 1-6-4-3-2-5
(c) 1-2-3-4-5-6
(d) 3-4-5-1-2-6

4. Which of the following is correct about Bose-Einstein condensate?

(a) Referred to as the fifth state of matter.
(b) BEC is the fourth state matter after gas.
(c) To make a Bose-Einstein condensate,start with solid state.
(d) None of the above

5. Match list 1(industrial process) with List 2 (industry with which associated) and select the correct option.

LIST-1	LIST-2
A. Cracking	1. Rubber
B. Smelting	2. Petrolium
C. Hydrogenation	3. Copper
D. Vulcanisation	4. Edible fats

Codes:

	A	B	C	D
(a)	3	2	1	4
(b)	2	3	1	4
(c)	2	3	4	1
(d)	3	2	4	1

6.Match the following LIST 1 (disease) with LIST 2 (Defficiency)

LIST 1	LIST 2
A. Rickets	1.Vitamin B
B. Hypokalemia	2.Vitamin D
C. Hyponutremia	3.Pottasium
D. Beri Beri	4.Sodium

Codes:

	A	B	C	D
(a)	2	3	4	1
(b)	3	2	1	4
(c)	2	3	1	4
(d)	3	2	4	1

7. Arrange the follwing planets in the increasing distance from sun.
1.Earth
2.Mercury
3.Mars
4. Uranus
5. Jupitor
(a) 1-2-4-5-3
(b) 2-1-3-5-4
(c) 2-1-4-5-3
(d) 1-2-5-3-4

8. Match the following in Table 1 with Table 2:

List 1	List 2
A. Scattering	1. Diamond
B. Total Internal Reflection	2. Snells law
C. Refraction	3. Rainbow
D. Dispersion	4. Blue color of sky

Codes:

	A	B	C	D
(a)	4	2	3	1
(b)	4	1	2	3
(c)	3	1	2	4
(d)	3	2	1	4

9. Consider the following statements regarding gentics.
1.Dmitri Mendeleev is the father of genetics.
2. To prove genetics experiments were done with pea plants.
3.Law of Dominance states that recessive alleles will always be masked by dominant alleles.
4.law of segregation, states that allele pairs separate during gamete formation, and randomly unite at fertilization.
Which among the following are in correct :
(a) 1 only
(b) 1 and 2 only
(c) 1,2 and 3 only
(d) All the above

10.Consider the following sentences:

A: Divergent evolution is the process of tracing back two or more species to their common ancestor.
B: Wings of butterfly and of birds look alike. They are not anatomically similar structures though they perform similar functions.

(a) Both A and B are true & B is correct explanation of A
(b) Both A and B are true but B is not correct explanation of A
(c) A is true But B is false
(d) A is false but B is true

11. Which among the following is not an SI unit if measurement.

(a) Kilogram
(b) Mole
(c) Candela
(d) Degree

12. Match List 1 (theory) with List 2 (proposers).

LIST 1	LIST 2
A. Geo centric theory	1. Edwin P
B. Helio centric theory	2. Ptolemy
C. Big bang theory	3. Coppernicus
D. Hubbles law	4. Georges Lamitre

CODES:

	A	B	C	D
(a)	2	3	4	1
(b)	3	2	1	4
(c)	2	4	1	3
(d)	3	1	4	2

13. Which of the following physical properties is/are vector quantities?

1. Displacement
2. Weight
3. Temperature
4. Volume

Select the correct answer using the code given below.
(a) 1 only
(b) 1 and 2 only
(c) 1,2 and 3 only
(d) 1, 2, 3 and 4

14.Match List 1 (organic acids) with List 2 (sources)

List 1	List 2
A. Acetic acid	1. Sour milk, curd
B. Ascorbic acid	2. Lemon, orange
C. Citric acid	3. Vinegar
D. Lactic acid	4. Guava, amla

Codes:

	A	B	C	D
(a)	3	4	2	1
(b)	4	3	1	2
(c)	1	2	4	3
(d)	2	1	3	4

15.Consider the following statements regarding induction stove?

1. Cooking occurs due to heat energy produced by the resistance provided by vessel to the eddy currents generated in the vessel.
2. Heating is more uniform than provided by any other method.

Select the correct answer using the code given below.
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

16. Which among the following is correct regarding litmus paper.

A: Blue litmus paper turns red under acidic conditions.
B: Red litmus paper turns blue under basic or alkaline conditions.

(a) Both A and B are true & B is correct explanation of A
(b) Both A and B are true but B is not correct explanation of A
(c) A is true But B is false
(d) A is false but B is true

17. What are the fuels used in fuel cell?
1. Hydrogen
2. Oxigen
3.Clorine
4. Phosphorous

(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d)All the above

18. Which among the following is not a disease related technology.
(a) MRI Scan
(b) CT Scan
(c) QR Scan
(d) X-RAY Scan

19. Assertion (A) : Human immune system are handled by special types of leukocytes, called lymphocytes
Reason (R) :B cells and T cells are the major types of lymphocytes.

(a) Both A and R are true & R is correct explanation of A
(b) Both A and R are true but R is not correct explanation of A
(c) A is true But R is false
(d) A is false but R is true

20.consider the following statements:

1. Sodium Bicarbonate is commonly known as baking soda.
2.Baking soda is used in fire extinguishers.
3.Baking soda is Used as an Antacid.

(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d)All the above

21.The complete reflection of a light ray reaching an interface with a less dense medium when the angle of incidence exceeds the critical angle.Which among the following is correct?

(a)Reflection
(b)Refraction
(c)Total Internal Reflection
(d)Polarisation

22.Consider the following statements:
The purpose of adding sodium sulphate and sodium silicate to the detergent in a washing powder is :
1.To keep washing powder dry.
2.To maintain the alkalinity of the powder.

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) None of the above

23.Which one of the following types of coal contains higher percentage of carbon than others?

(a)Bituminous coal
(b)Lignite
(c)Peat
(d)Anthracite

24. Match list 1 (fuel gases) with List 2 (major constituents) and select correct answer using codes given below

LIST 1	LIST 2
A. CNG	1. CO, Hydrigen
B. Coal Gas	2. Butane,propane
C. LPG	3. Metane,ethane
D. Water gas	4.Hydrogen,Methane,carbon monoxide(CO)

Codes:

	A	B	C	D
(a)	2	1	3	4
(b)	3	4	2	1
(c)	2	4	3	1
(d)	3	1	2	4

25. Consider the following stetements:

A: a breeze blowing towards the sea from the land is called sea breeze
R: Land breeze is a breeze blowing towards the land from the sea, especially during the day owing to the relative warmth of the land.

(a) Both A and B are true & B is correct explanation of A
(b) Both A and b are true but B is not correct explanation of A
(c) A is true But B is false
(d) A is false an B is false

26. Water pollution is mesuredby measuring dissolved amount of :

(a)Oxigen
(b)Oxone
(c)Nitrogen
(d)sulphur

27.Arrange the following hydrocarbons in the increasing order of molecular weights.

1.Methane
2.Propane
3.Butane
4.Ethane

Choose the correct sequences from below
(a) 1-2-3-4
(b) 4-3-2-1
(c) 1-4-3-2
(d) 1-4-2-3

28. Which among the following phenomena explains the fact that we see lightning much before we hear its thunder?

(a) Light waves can travel in vacuum whereas sound waves cannot.
(b) Light waves travels faster than sound waves.
(c) Intensity of light waves is more than sound waves.
(d) Light waves are scattered more than sound waves.

29. Mixture of which one of the following pairs of gases is the cause of occurence of most of the explosion in mines?

(a) Hydrogen and oxigen
(b) Oxygen and acetylene
(c) Methane & air
(d) Carbon dioxide and Methane

30.In an atom,the order of filling up of the orbitals is governed by:

(a)Pauli's exclusion principle.
(b)Aufbau Principle
(c)Hunds Rule
(d)Heisenbergs uncertainity Principle.

31. A company marketing food products advertises that its items do not contain trans-fat.What does this campaign signify tot the customers?

1. The food products are not made of hydrogenated oils.
2.The food products are not made out of animal fats/oils.
3. the oils that used are not likely to damage the cardio vascular health of the consumers.
Which of the statements given above is/are correct?

(a)1 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

32. Which one of the following is produced during the formation of photochemical smog?

(a) Hydrocarbons
(b) Nitrogen oxides
(c) Ozone
(d) Methane

33. What are RUBIES and Sapphires chemically known as?
(a) Silicon dioxide
(b) Aluminium oxide
(c) Led tetroxide
(d) Boron Nitride

34. Which one of the following is also called stranger gas?

(a) Argon
(b) Neon
(c) xenon
(d) Nitrous Oxide

35. Which one the following statement is not correct?

(a) The boiling point of aquous solution is higher than that of pure water.
(b)Addition of solutes to a solution causes an increase in its water potential.
(c)The vapour pressure of water in a solution is lower than that of pure water.
(d) When a solution is seperated from water by a semi permiable membrane, water movement can be prevented by applying prssure to solution.

36. Soft drinks such as colas contains significant quantities of :
(a) coffeine
(b) Nicotine
(c) tannin
(d) Renin

37. With reference to ionic compounds consider the following statements

1.Ionic components are insoluble in alcahol
2. Ionic components in the solid state are good conductors of electricity
Which of these statements is are correct
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) neither 1 nor 2

38. Indiscriminate disposal of used flurescent electric lamps causes mercury pollution in the environment.Why is mercury is used in manufacture of these lamps?
(a) A mercury coating on the inside of a lamp makes the light bright white.
(b) When the lamp is switched ON mercury in lamp causes the emission of UV radiations.
(c) When the lamp is switched ON it is mercury which converts UV energy into visible light.
(d)None of the statement given above is cirect about the use of mercury in mfg of fluroscent lamps.

39. Which among the following is a viral disease?
1. AIDS
2. Scabies
3. Polio
4. Pyorrohoea.
(a) 1 and 2 only
(b) 1 and 4 only
(c) 2 and 3 only
(d)2 and 4 only

40.Which one of the following is another name of RDX?

(a) Cyanohydrin
(b) Dextran
(c) Cyclohexane
(d) Cyclonite

41. Which one of the following non metals is not a poor conductor of electricity.
(a) Sulphur
(b) selenium
(c) Bromine
(d) phosphorous

42. Which one among the follwoing is called philosophers wool?

(a) Zinc bromide
(b) Zinc Nitrate
(c) Zinc oxide
(d) Zinc cloride

43. Which one of the follwoing doesn't contains silver?

(a) Horn silver
(b) German silver
(c) Ruby silver
(d) Lunar caustic

44. Salts of which of the following provide colour of fireworks?

(a) Zinc & sulphur
(b) Pottasium & Mercury
(c) Strontium & Barium
(d) Chromium & nickel

45.Which on of the materials is very hard and very ductile?
(a) Carborundum
(b) tungsten
(c) Cast iron
(d) Nichrome

46. Consider the following stements about acetylene:

1 it is used in welding industry.
2 it is a narrow material for preparing plastic
3. It is easily octained by misxing silicon carbiode with water.
Which of these are correct:
(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 3 only
(d)All the above

47. In a dry cell (battery) which of the following are used as electrolytes?

(a) Amonium cloride & zinc cloride
(b) Sodium chloride & Calcium cloride
(c) Magnisium chloride & zinc chloride
(d) Ammonium cloride & calcum chloride

48. Which are the follwoing matels that doesnt for amalgums?

(a) Zinc
(b) copper
(c) Magnisium
(d) Iron

49. Chemical compound chlorination is a process used for water purification.The disinfecting action of chlorine is Mainly due to :

(a) The formation of Hypo clorous acid when chlorine is added to water
(b)The formnation of Hydro clorous acid when chlorine is added to water.
(c)The formation of Nascent oxigen when chlorine is added to water.
(d)The formation of hydrogen when chlorine is added with water.

50. Consider the following statements :

1. Baking soda is used in fireextinguishers
2. Quick lime is used in the manufacture of glass.
3.Gypsum is used in mfg of plaster of parris.

Which of the stements above is/are correct
(a) 1 and 2
(b) 2 and 3
(c) 1 only
(d) 1 2 and 3

51. Which of the following statements is not correct.

(a) The presence of NaCl increases the rate of setting of plaster of parris
(b)Gypsum is added to the cement to slow down its rate of setting.
(c) All alkaline earth metals form hydrated salts.
(d) barium & strontium are found free in nature.

52. Match list 1 with List 2 and select the correct answer

LIST 1	LIST 2
A. Diamond	1. Calcium
B. Marble	2. silicon
C. Sand	3.Aluminium
D. Ruby	4.Carbon

Codes:

	A	B	C	D
(a)	3	1	2	4
(b)	4	2	1	3
(c)	2	1	3	4
(d)	4	1	2	3

53. A: Synthetic detergents can lather well in hard water.
B: Synthetic detergents form soluble calcium & magnisium salts with hard water.

(a) Both A and B are true & B is correct explanation of A
(b) Both A and b are true but B is not correct explanation of A
(c) A is true But B is false
(d) A is false but B is true

54. An aqueous solution of copper sulphte is acidic in nature because the salts under goes:

(a) Dialisis
(b) Electrolysis
(c) Hydrolysis
(d)Photolysis

55. When ants bite ,they injects :

(a) Glacial acetic acid
(b) methanil
(c) Formic acid
(d) Stearic acid

56. The freezing compartment is located at the top in a refrigerator. Why?

(a) Conduction
(b) Convection
(c) Radiation
(d) All of the above

57. Assertion A: To dilute HS acid is added to water & not acid to water.
Reason R: This is an exothermic reaction

(a) Both A and R are true & R is correct explanation of A
(b) Both A and R are true but R is not correct explanation of A
(c) A is true But R is false
(d) A is false but R is true

58. Consider the following statements:
A: Formic acid is stronger acid than acetic acid.
B: Formic acid is miscible with water and most polar organic solvents

(a) Both A and B are true & B is correct explanation of A
(b) Both A and B are true but B is not correct explanation of A
(c) A is true But B is false
(d) A is false but B is true

59. consider the following :

1. carbon dioxide
2. oxides of nitrogen
3.Oxides of sulphur

Which of the above is/are emissions from coal combustion at thermal power plants.
(a) 1 only
(b) 2&3
(c) 1 and 3
(d) 1,2 and 3

60.Consider the following statements about colors:

A. RED,BLUE & GREEN are considered as complimentary colors

B. Colors which on mixing produce white are called secondary colors.

Which among are coorect?
(a) Both A and B are true & B is correct explanation of A

(b) Both A and B are true but B is not correct explanation of A
(c) A is true But B is false
(d) A is false and B is false

61. Which among the follwoing is incorrect regarding optical fibre?

(a)Works on the principle of total Internal reflection.
(b)Inner part is Core of higher refractive index.
(c)Outer part is clading with higher refractive index.
(d)Optical fibres are used in decorative works

62. Consider the following statements Hard water is not suitable for:
1.Drinking
2.Washing clothes with soap
3.Use in boilers
4.Irrigating crops

Which of these statements are correct?
(a) 1 and 2 only
(b) 1,2 and 3 only
(c) 2 ,3 and 4 only
(d) All of the above

63.Which among the following is not a part of Nuclear reactor?
(a) Generator
(b) Moderator
(c) Coolant
(d) Control Rods

64.Consider the following regarding LASER:
1. LASER stands for Light Amplification by Stimulated Emission of Radiations.
2. It is an electrical device with light properties.
3. It can travel long distance without spread.
4. It is polychromatic.
Which among are correct?
(a) 1 and 2 only
(b) 1 and 3 only
(c) 2 and 4 only
(d) 1 and 4 only

65. Which of the following constiitutes Green house effect?
1. CO2
2. Water Vapour
3. Methane
4. Oxigen

(a) 1 only
(b) 1 and 2 only
(c) 1,2 and 3 only
(d) All the above

66.Consider following facts about human diseases:
A. Disease that occur from the time of birth are referred as aquired diseases.
B. Diseases that occur or develop after birth is cogenital disease.
Which among is correct?

(a) Both A and B are true & B is correct explanation of A
(b) Both A and B are true but B is not correct explanation of A
(c) A is true But B is false
(d) A is false and B is false

67. Which among the following is not a selestial body.

(a). Asteroids
(b). Thyroids
(c). Meteors
(d). Comets

68.Aspartame is an artidficial sweetner sold in market.it consists of amino acids & provides calories like other amino acids.Yet,it is used as a low calorie sweetening agent in food items.what is the basic of this use?

(a)Aspartame is a sweet as table sugar,but unline table sugar,it is not readily oxidised in human body due to lack of requisite enzymes.
(b)What asartame is used in food processing,the sweet taste remains but it becomes resistant to oxidation.
(c) Aspartame is as sweet as sugr ,but after ingestation into body,it is converted into metabolitics that yield no calories.
(d)Aspartame is several times sweeter than table sugar,hence food items made with samll quantities yiels fewer calories on oxidation.

69. Arthritis is a disease associated with :

(a) Heart
(b) Liver
(c) Joints
(d) Muscles

70.Consder the following:

A: Acquired immunity is pathogens specific & present from birth.
B. Innate immunity refers to nonspecific defense mechanisms that come into play immediately.

(a) Both A and B are true & B is correct explanation of A
(b) Both A and B are true but B is not correct explanation of A
(c) A is true But B is false
(d) A is false but B is true

71. Consider the following:
1. Oxides of Hydrogen
2. Oxides of Nitrogen
3. Oxides of Sulphur

which of the above cause(s) acid rain?
(a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1,2 and 3

72. Match the following LIST 1 (Rays) with LIST 2 (property)

LIST 1	LIST 2
A. Alpha	1. Nuetral
B. Beta	2. Micro wave
C. Gama	3. Positive
D. X-ray	4. Negative

Codes:

	A	B	C	D
(a)	3	4	1	2
(b)	4	3	2	1
(c)	1	2	4	3
(d)	2	1	3	4

73.Which of the following is not radio active?

(a)Astatine
(b)Francium
(c)Tritium
(d)Zirconium

74. Consider the following statements:

A.Osmosis is a process by which molecules of a solvent tend to pass through a semipermeable membrane from a high concentrated solution into a less concentrated one.
B. Reverse Osmosis is a process by which a solvent passes through a porous membrane in the direction opposite to that for natural osmosis at normal conditions.

(a) Both A and B are true & B is correct explanation of A.
(b) Both A and B are true,But B is not correct explanation of A.
(c) A is true but B is false
(d) Neither A nor B is true

75.Which one of the following pairs of metals constitutes the lightest metal & heaviest metal respectively.

A. Lithium & mercury.
B. Lithium and osmium.
C. Aluminium & osmium.
D aluminium & mercury.

THIS IS PART OF IASTODAY.in PRELIMS 90 DAYS SERIES.

TEST 1 BASIC SCIENCE

THIS IS TEST 1 BASIC SCIENCE (BIO<CHE<PHY)

CONDUCTED ON MARCH 20 2017

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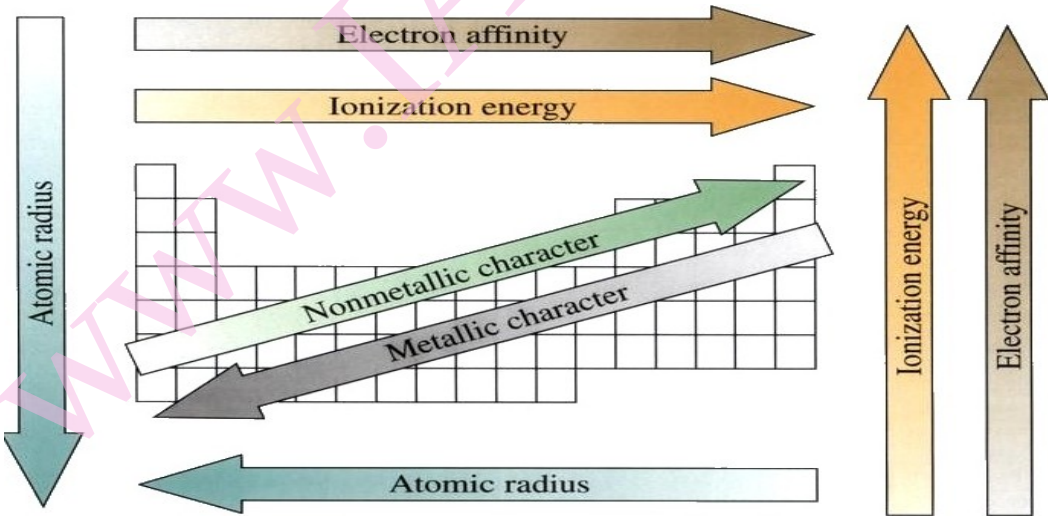
GENERAL STUDIES ANSWERS- TEST 3501 (2017).

1. Option C

The Periodic Table of Elements categorizes like elements together. Dmitri Mendeleev, a Russian scientist, was the first to create a widely accepted arrangement of the elements in 1869. Mendeleev believed that when the elements are arranged in order of increasing atomic mass, certain sets of properties recur periodically. Although most modern periodic tables are arranged in eighteen groups (columns) of elements, Mendeleev's original periodic table had the elements organized into eight groups and twelve periods (rows).

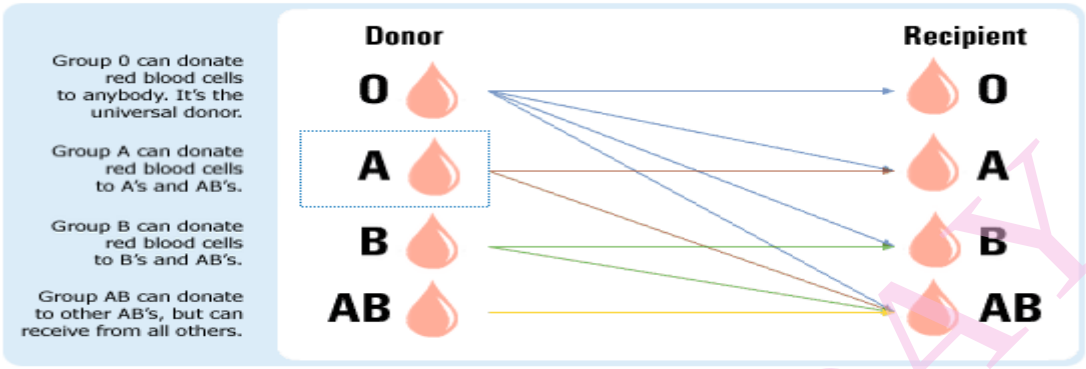


2. Option A

Group A – has only the A antigen on red cells (and B antibody in the plasma)

Group B – has only the B antigen on red cells (and A antibody in the plasma)

Group AB – has both A and B antigens on red cells (but neither A nor B antibody in the plasma)
AB is universal acceptor.
Group O – has neither A nor B antigens on red cells (but both A and B antibody are in the plasma) O is universal donor.



3. Option C

NEBULA is a cloud of gas (hydrogen) and dust in space. Nebulae are the birthplaces of stars. There are different types of nebula. An Emission Nebula e.g. such as Orion nebula, glows brightly because the gas in it is energised by the stars that have already formed within it.

RED GIANT is a large bright star with a cool surface. It is formed during the later stages of the evolution of a star like the Sun, as it runs out of hydrogen fuel at its centre. Red giants have diameter's between 10 and 100 times that of the Sun.

RED DWARF are very cool, faint and small stars, approximately one tenth the mass and diameter of the Sun. They burn very slowly and have estimated lifetimes of 100 billion years. Proxima Centauri and Barnard's Star are red dwarfs.

WHITE DWARF is very small, hot star, the last stage in the life cycle of a star like the Sun. White dwarfs have a mass similar to that of the Sun, but only 1% of the Sun's diameter; approximately the diameter of the Earth.

SUPERNOVA is the explosive death of a star, and often results in the star obtaining the brightness of 100 million suns for a short time. There are two general types of Supernova:-

Type I These occur in binary star systems in which gas from one star falls on to a white dwarf, causing it to explode.

Type II These occur in stars ten times or more as massive as the Sun, which suffer runaway internal nuclear reactions at the ends of their lives,

leading to an explosion. They leave behind neutron stars and black holes. Supernovae are thought to be main source of elements heavier than hydrogen and helium.

BLACK HOLES are believed to form from massive stars at the end of their life times. The gravitational pull in a black hole is so great that nothing can escape from it, not even light. The density of matter in a black hole cannot be measured. Black holes distort the space around them, and can often suck neighbouring matter into them including stars.

4. Option A

In 1924, Albert Einstein and Satyendra Nath Bose predicted the "Bose–Einstein condensate" (BEC), sometimes referred to as the fifth state of matter. In a BEC, matter stops behaving as independent particles, and collapses into a single quantum state that can be described with a single, uniform wavefunction.

To make a Bose-Einstein condensate, you start with a cloud of diffuse gas. Many experiments start with atoms of rubidium. Then you cool it with lasers, using the beams to take energy away from the atoms. After that, to cool them further, scientists use evaporative cooling.

5. Option C

CRACKING -In petroleum geology and chemistry, *cracking* is the process whereby complex organic molecules such as kerogens or long chain hydrocarbons are broken down into simpler molecules such as light hydrocarbons, by the breaking of carbon-carbon bonds in the precursors.

SMELTING is a form of extractive metallurgy; its main use is to produce a base metal from its ore. This includes production of silver, iron, copper and other base metals from their ores.

HYDROGENATION is a chemical reaction between molecular hydrogen (H_2) and another compound or element, usually in the presence of a catalyst such as nickel, palladium or platinum. The process is commonly employed to reduce or saturate organic compounds.

VULCANISATION is a chemical process for converting natural rubber or related polymers into more durable materials by the addition of sulfur or other equivalent curatives or accelerators. These additives modify the polymer by forming cross-links (bridges) between individual polymer chains.

6. Option A

Rickets is defective mineralization or calcification of bones before epiphyseal closure in immature mammals due to deficiency or impaired metabolism of vitamin D, phosphorus or calcium, potentially leading to fractures and deformity. Rickets is among the most frequent childhood diseases in many developing countries.

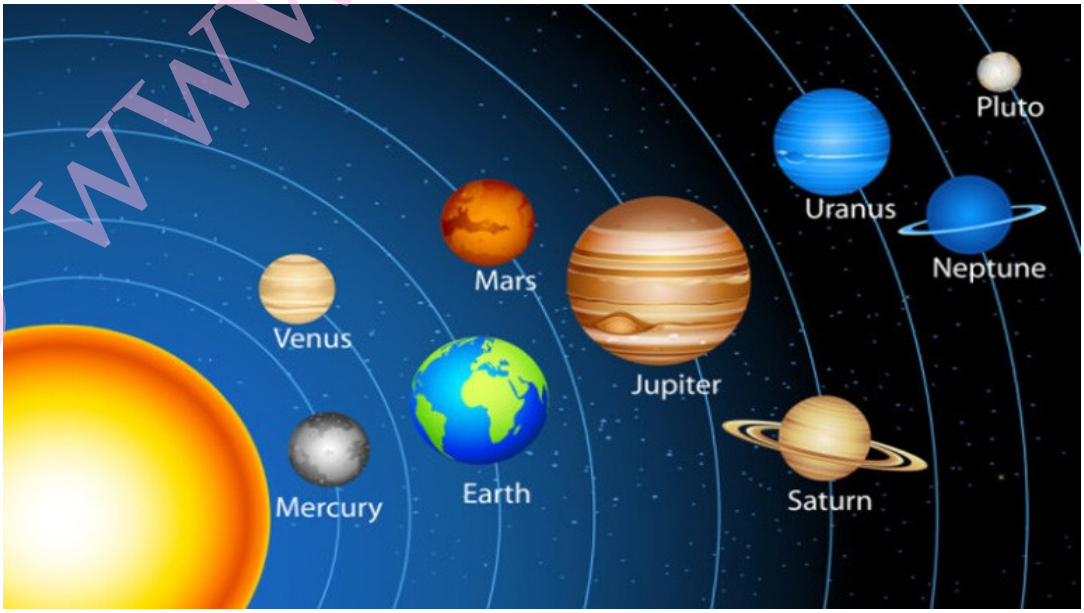
Hypokalemia, also spelled hypokalaemia, is a low level of potassium (K^+) in the blood serum.Hypertension and hypokalemia can also be seen with a deficiency of the 11-beta-hydroxysteroid dehydrogenase type 2 enzyme.

Hyponatremia, also spelled hyponatraemia, is a low sodium level in the blood.Hyperplasia in which the adrenal glands do not produce enough steroid hormones (combined glucocorticoid and mineralocorticoid deficiency).

Beriberi is a disease caused by a vitamin B1 (thiamine) deficiency. There are two types of the disease: wet beriberi and dry beriberi. Today, beriberi mostly occurs in people with an alcohol use disorder (alcoholism)

7. Option B

Our solar system consists of an average star we call the Sun, the planets Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.(**Pluto* is no longer considered as planet).** It includes: the satellites of the planets; numerous comets, asteroids, and meteoroids; and the interplanetary medium



8. Option B

Scattering is a general physical process where some forms of radiation, such as light, sound, or moving particles, are forced to deviate from a straight trajectory by one or more paths due to localized non-uniformities in the medium through which they pass.

A clear cloudless day-time sky is blue because molecules in the air scatter blue light from the sun more than they scatter **red** light. When we look towards the sun at sunset, we see **red** and **orange** colours because the blue light has been scattered out and away from the line of sight.

Total internal reflection is the phenomenon which occurs when a propagated wave strikes a medium boundary at an angle larger than a particular critical angle with respect to the normal to the surface.

The refractive index of diamond is pretty high (2.4) and is also dispersive (coefficient is 0.044). Due to this fact, diamond is an important application in optics.Light once entered can't come out & it will undergoes continous TIR.

A rainbow is a meteorological phenomenon that is caused dispersion of light in water droplets resulting in a spectrum of light appearing in the sky. It takes the form of a multicoloured arc. Rainbows caused by sunlight always appear in the section of sky directly opposite the sun.

Snell's law (also known as Snell–Descartes law and the law of refraction) is a formula used to describe the relationship between the angles of incidence and refraction, when referring to light or other waves passing through a boundary between two different isotropic medium, such as water, glass, or air.

9. Option A

Gregor Mendel the father of genetics **(so A is only wrong)**.Did experiments with pea plants.Recorded all his data and came up with important hereditary discoveries.Died before his discoveries were recognized and appreciated

Mendel's Law of Dominance states that recessive alleles will always be masked by dominant alleles. Therefore, a cross between a homozygous dominant and a homozygous recessive will always express the dominant phenotype, while still having a heterozygous genotype.One of these principles, now called Mendel's law of segregation, states that allele pairs separate or segregate during gamete formation, and randomly unite at fertilization.

10. Option A

Divergent evolution is the process of tracing back two or more species to their common ancestor. They become a different species to their ancestors and what was once one species has diverged into two. Divergent evolution may be used in contrast to a related term convergent evolution.Homology is based on divergent evolution whereas Analogy refers to a situation exactly opposite [convergent evolution].Wings of butterfly and of birds look alike. They are not anatomically similar structures though they perform similar functions.

11. Option D

Its self explanatory.There are seven base units in the SI system:

- the kilogram (kg), for mass.
- the second (s), for time.
- the kelvin (K), for temperature.
- the ampere (A), for electric current.
- the mole (mol), for the amount of a substance.
- the candela (cd), for luminous intensity.
- the meter (m), for distance.

12. Option A

In astronomy, the **geocentric model** (also known as geocentrism, or the Ptolemaic system) is a superseded description of the universe with the Earth at the center.

Heliocentric theory is a model of the solar system that posits a central place for the Sun, with the planets orbiting it. It is most closely associated with the 16th-century work of Copernicus and the 17th-century work of Galileo, and the theory was widely adopted after Copernicus' death.

The **Big Bang Theory** is the leading explanation by Georges Lamitre about how the **universe** began. At its simplest, it talks about the **universe** as we know it starting with a small singularity, then inflating over the next 13.8 billion years to the cosmos that we know today.

Hubble's law, by Edwin P hubbles which says simply that a galaxy's velocity (or as is sometimes plotted, its redshift) is directly proportional to its distance, also tells us something important about the state of the universe.

13. Option A

Scalars are quantities that are fully described by a magnitude (or numerical value) alone.
Vectors are quantities that are fully described by both a magnitude and a direction.
The fact that magnitude occurs for both scalars and vectors can lead to some confusion. There are some quantities, like speed, which have very special definitions for scientists. By definition, speed is the scalar magnitude of a velocity vector.
Examples of such quantities include distance, displacement, speed, velocity, acceleration, force, mass, momentum, energy, work, power, etc.

14.Option A

Organic Acids & Source

Acid	Source
Acetic acid	Vinegar
Ascorbic acid	Guava, amla
Citric acid	Lemon, orange and other citrus fruits
Lactic acid	Sour milk, curd
Methanoic acid	Ant sting, nettle sting
Oxalic acid	Tomato
Tartaric acid	Tamarind

15. Option A

Induction cooking heats a cooking vessel by magnetic **induction**, instead of by thermal conduction from a flame, or an electrical heating element.In an **induction cooker**, a coil of copper wire is placed under the cooking pot and an alternating electric current is passed through it.
In an induction stove cooking occurs due to heat energy produced by the resistance provided by vessel to the eddy currents generated in the vessel. Hence, statement 1 is correct.
Most uniform heating is provided by Microwave Oven. Hence, statement 2 is incorrect.

16. Option A

Blue litmus paper turns red under acidic conditions and red litmus paper turns blue under basic or alkaline conditions, with the color change occurring over the pH range 4.5–8.3 at 25 °C (77 °F). Neutral litmus paper is purple.A universal indicator is a pH indicator composed of a solution of several compounds that exhibits several smooth colour changes over a pH value range from 1 to 14 to indicate the acidity or alkalinity of solutions.

17. Option A

A fuel cell is a device that converts chemical potential energy (energy stored in molecular bonds) into electrical energy. A PEM (Proton Exchange Membrane) cell uses hydrogen gas (H_2) and oxygen gas (O_2) as fuel.

The products of the reaction in the cell are water, electricity, and heat.In a fuel cell, the catalyst facilitates the reaction of oxygen and hydrogen. It is usually made of platinum powder very thinly coated onto carbon paper or cloth. The catalyst is rough and porous so the maximum surface area of the platinum can be exposed to the hydrogen or oxygen.

18. Option C

QR code is a machine-readable code consisting of an array of black and white squares, typically used for storing URLs or other information for reading by the camera on a smartphone.All others are Correct.
Magnetic resonance imaging (*MRI*) uses a large magnet and radio waves to look at organs and structures inside your body. Health care professionals use *MRI scans* to diagnose a variety of conditions, from torn ligaments to tumors. MRIs are very useful for examining the brain.
A computerized tomography (CT) scan combines a series of X-ray images taken from different angles and uses computer processing to create cross-sectional images, or slices, of the bones, blood vessels and soft tissues inside your body. CT scan images provide more detailed information than plain X-rays do.
X-rays scan uses a type of radiation, and when they pass through the body, dense objects such as bone block the radiation and appear white on the x-ray film.

19. Optiona A

The cells of the adaptive immune system are special types of leukocytes, called lymphocytes. B cells and T cells are the major types of lymphocytes and are derived from hematopoietic stem cells in the bone marrow.
The immune system is a network of cells, tissues, and organs that work together to defend the body against attacks by “foreign” invaders. These are primarily microbes—tiny organisms such as bacteria, parasites, and fungi that can cause infections.The immune system is the body's defense against infectious organisms and other invaders. Through a series of steps called the immune response, the immune system attacks organisms and substances that invade body systems and cause disease.

20.Option D

Baking soda, sodium bicarbonate, helps regulate pH—keeping a substance neither too acidic nor too alkaline. When baking soda comes in contact with either an acidic or an alkaline substance, its natural effect is to neutralize that pH.**Baking soda** thrown on a **fire** creates carbon dioxide and puts out the **fire**. This is safer than throwing water on a grease fire, which can splatter and spread the flames to flammable items. Only use baking soda on a small controllable flame

21. Option C

TIR is the complete reflection of a light ray reaching an interface with a less dense medium when the angle of incidence exceeds the critical angle.
Reflection is the throwing back by a body or surface of light, heat, or sound without absorbing it.
Refraction is the fact or phenomenon of light, radio waves, etc. being deflected in passing obliquely through the interface between one medium and another or through a medium of varying density.
Polarisation is the action of restricting the vibrations of a transverse wave, especially light, wholly or partially to one direction.

22. Option C

The addition of silicates to synthetic detergents has proved very beneficial. Silicates soften water by the formation of precipitates that can be easily rinsed away. Soluble silicates contribute to detergents as cleaning aids, processing aids, and corrosion inhibitors. As cleaning aids, soluble silicates provide alkalinity and promote soil suspension. Sodium sulphate is simply a filler in detergent powder, in much the same way as fillers are used in many medical tablets, it doesn't play any active role as such.

23. Option D

Anthracite: This is the highest ranked, hardest, oldest, and least common type of coal. It possesses a high energy content, high percentage of carbon (>85%) and relatively little moisture or volatiles.
Bituminous: This is the second rank of coal, softer and younger than anthracite, and containing a lower percentage of carbon (45-85%) and therefore more moisture and volatiles.
***Lignite*:** This is the softest, youngest, and wettest rank of coal, often referred to as "brown coal" with a carbon content of only 25-35% and correspondingly lower energy content.
Peat has a carbon content of less than **60**% on a dry ash-free basis. Lignite is the lowest rank of coal. It is a peat that has been transformed into a rock, and that rock is a brown-black coal. Lignite sometimes contains recognizable plant structures.

24. Option B

Liquefied Petroleum Gas or **LPG** (also called **Autogas)** consists mainly of propane, propylene, butane, and butylene in various mixtures.
Compressed Natural Gas or CNG contains hydrocarbons such as ethane and propane as well as other gases such as nitrogen, helium, carbon dioxide, sulphur compounds, and water vapour.
Coal gas. **Coal gas**, gaseous **mixture** mainly hydrogen, methane, and carbon monoxide formed by the destructive distillation (i.e., heating in the absence of air) of bituminous coal and used as a fuel. Sometimes steam is added to react with the hot coke, thus increasing the yield of gas.
Water gas is a mixture of carbon monoxide and hydrogen (not water). It is produced when steam is passed over red-hot coke (carbon). Water gas is so named because water (steam) is a source for its production.Both CO and H2 are inflammable gases, and so water gas is used as a fuel.

25. Option D

Unequal heating of air over land and water results in breezes near shorelines. While the land is warm during the day, air above it rises, and a cool breeze blows in from the sea. As the land cools off at night, air pressure over it increases, and a cool land breeze blows out to the sea.

The wind will blow from the higher pressure over the water to lower pressure over the **land** causing the **sea breeze**. The **sea breeze** strength will vary depending on the temperature difference between the **land** and the ocean. At night, the roles reverse. The air over the ocean is now warmer than the air over the **land**.

26.Option A

Water pollution in river or any other water body is measured by amount of dissolved oxygen. Water pollution can be measured on the basis of parameters like dirtyness, change in texture, total suspended solid and other important factors like,

- Decrease in dissolved oxygen (DO) (concentration of dissolved oxygen in water samples).
- Increase in BOD, (Biochemical Oxygen Demand) it is a chemical procedure for determining the amount of dissolved oxygen needed by aerobic biological organisms in a body of water to break down organic material present in a given water sample at certain temperature over a specific time period.
- Increase in COD, (Chemical Oxygen Demand) test is commonly used to indirectly measure the amount of organic compounds in water.

27. Option D

The molecular weight is the mass of one mole of a substance. Usually, the units used for this are grams per mole.Molecular weight is often used interchangeably with molecular mass in chemistry, but there is a difference between the two.Molecular mass is a measure of mass and molecular weight is a measure of force acting on the molecular mass.

Multiplying by the molar mass constant ensures that the calculation is dimensionally correct: standard relative atomic masses are dimensionless quantities (i.e., pure numbers) whereas molar masses have units (in this case, grams/mole). 2) = 2 × 35.453(2) × 1 g/mol = 70.906(4) g/mol.

28. Option B

Although thunder and lightning occur at the same time, the lightning is seen before the thunder is heard because light travels at a much faster speed than sound.

What is the cause of lightning?

Heavier, negatively charged particles sink to the bottom of the cloud. When the positive and negative charges grow large enough, a giant spark - **lightning** - occurs between the two charges within the cloud. This is like a static electricity sparks you see, but much bigger.

29. Option C

Cause of blast in a mine in generally mixture of methane and air. CH4 in the main gas exerted from a mine, when it comes in contact with air, explosions take place.Methane is created near the surface, and it is carried into the stratosphere by rising air in the tropics. Uncontrolled build-up of methane in Earth's atmosphere is naturally checked—although human influence can upset this natural regulation—by methane's reaction with hydroxyl radicals formed from singlet oxygen atoms and with water vapor.

30. Option C

The **Pauli Exclusion Principle** states that, in an atom or molecule, no two electrons can have the same four electronic quantum numbers. As an orbital can contain a maximum of only two electrons, the two electrons must have opposing spins.

The **Aufbau principle** states that, hypothetically, electrons orbiting one or more atoms fill the lowest available energy levels before filling higher levels (e.g., 1s before 2s). In this way, the electrons of an atom, molecule, or ion harmonize into the most stable electron configuration possible.

Hund's rule: every orbital in a subshell is singly occupied with one electron before any one orbital is doubly occupied, and all electrons in singly occupied orbitals have the same spin.

The **Heisenberg uncertainty principle** states that it is impossible to know simultaneously the exact position and momentum of a particle. That is, the more exactly the position is determined, the less known the momentum, and vice versa

31. Option D

Self explanatory as all are correct.Artificial **trans fats** (or **trans fatty** acids) are created in an industrial process that adds hydrogen to liquid vegetable oils to make them more solid. The primary dietary source for **trans fats** in processed food is "partially hydrogenated oils.

32. Option B

During the photochemical smog NO and O3 both are produced but major production is of nitrogen oxide (NO) and NO2.**Photochemical smog** is the chemical reaction of sunlight, nitrogen oxides and volatile organic compounds in the atmosphere, which leaves airborne particles and ground-level ozone.

33. Option B

Ruby and sapphire have the same chemical composition and crystal structure - they are both varieties of the **mineral corundum**. Rubies: The most desired variety of corundum is the ruby. The **red** color is produced by trace amounts of chromium in the mineral.Most people don't realize that ruby and sapphire are both gems of the mineral corundum. Both of these gems have the same chemical composition and the same mineral structure. Trace amounts of impurities determine if a gem corundum will be a brilliant red ruby or a beautiful blue sapphire.
They were composed of nearly pure alumina (Al2O3). The coloring substance which differentiates rubies and sapphires is believed to be chromium.

34. Option C

Xenon is a non-metal chemical element. It has the chemical symbol Xe and atomic number 54. It is one of the few elements that are a gas at Standard temperature and pressure.
Sir William Ramsay and M. W. Travers discovered this element in 1898. The element's name camefrom the Greek word *xenos*, which means 'stranger'. That's why it is known as 'stranger gas.'

35. Option B

Solute potential (Ψ_s) decreases with increasing solute concentration; a decrease in Ψs causes a decrease in the total water potential. The internal water potential of a plant cell is more negative than pure water; this causes water to move from the soil into plant roots via osmosis.Others are correct .

36. Option A

A soft drink is a beverage that typically contains carbonated water, a sweetener and a flavoring. The sweetener may be sugar, high-fructose corn syrup, fruit juice, sugar substitutes etc. Soft drinks may also contain caffeine, colorings, preservatives and other ingredients.

37. Option A

Ionic compound is a chemical compound in which ions are held together in a lattice structure by ionic bonds. Following the aphorism, “like dissolves like”, ionic compounds dissolve in polar solvents, especially those that ionize, such as water and ionic liquids. They are usually appreciably soluble in other polar solvents such as alcohols, acetone. Solid ionic compounds cannot conduct electricity because there are no mobile ions or electrons present in the lattice.

38. Option B

When the lamp is switched on, the mercury in the lamp causes the emission of ultra – violet radiations. A mercury-vapor lamp is a gas discharge lamp that uses an electric arc through vaporized mercury to produce light. The arc discharge is generally confined to a small fused quartz arc tube mounted within a larger borosilicate glass bulb.

39. Option C

AIDS & POLIO are viral diseases.Scabies is Fungal disease by acarus scabies.Pyorrhoea is protozoan disease by entamoeba gingivalis.

40. Option D

RDX, an initialism for Research Department Explosive, is an explosive nitroamine widely used in military and industrial applications. It is also known less commonly as cyclonite. Its chemical name is cyclotrimethylene trinitramine.

RDX is the organic compound with the formula $(O_2NNCH_2)_3$. It is a white solid widely used as an explosive. Chemically, it is classified as nitramide. A more powerful explosive than TNT, it was used widely in World War II.

It is often used in mixtures with other explosives and plasticizers or phlegmatizers (desensitizers). RDX is stable in storage and is considered one of the most powerful and brisant of the military high explosives.

41. Option B

Sulphur is the best electrical insulating material known, with a resistivity of about 2 × 1023 mW-cm.

- Electrical conductivity of sulphur is 5.0 × 10–14 S m–1.
- Electrical conductivity of selenium is 8 × 106 S m–1.
- Electrical conductivity of bromine is 1.0 × 10–10 S m–1.
- Electrical conductivity of phosphorous 1.0 × 10–9 S m–1.

Thus from this data it is clear that electrical conductivity of selenium is maximum.

42. Option C

Zinc oxide is an inorganic compound with the formula ZnO. And it is called Philosopher's wool. ZnO is a white powder that is insoluble in water, and it is widely used as an additive in numerous materials.

43. Option B

German silver has a color resembling silver, but is an alloy of primarily copper, nickel and zinc.

- Chlorargyrite is the mineral form of silver chloride (AgCl). It is also known as horn silver.
- Proustite is a sulfosalt mineral consisting of silver sulfarsenide, Ag3AsS3, known also as light red silver or ruby silver ore, and an important source of the metal.

- Silver nitrate is an inorganic compound with chemical formula AgNO3. It was once called lunar caustic because silver was called luna by the ancient alchemists.

44. Option C

Metal salts commonly used in firework displays include: strontium carbonate (red fireworks), calcium chloride (orange fireworks), sodium nitrate (yellow fireworks), barium chloride (green fireworks) and copper chloride (blue fireworks).

45.Option D

Nichrome (NiCr, nickel-chrome, chrome-nickel, etc.) generally refers to any alloy of nickel, chromium, and often iron and/or other elements or substances. Nichrome alloys are typically used in resistance wire.

46. Option A

Acetylene is used in welding industry.it is a narrow material for preparing plastic.*Acetylene* (systematic name: ethyne) is the chemical compound with the formula C_2H_2. It is a hydrocarbon and the simplest alkyne. This colorless gas is widely used as a fuel and a chemical building block. It is unstable in its pure form and thus is usually handled as a solution.

47.Option A

A dry cell uses a paste electrolyte, with only enough moisture to allow current to flow. Unlike a wet cell, a dry cell can operate in any orientation without spilling, as it contains no free liquid, making it suitable for portable equipment. By comparison, the first wet cells were typically fragile glass containers with lead rods hanging from the open top and needed careful handling to avoid spillage. Lead-acid battery did not achieve the safety and portability of the dry cell until the development of the gel battery. Wet cells have continued to be used for high drain applications such as starting internal combustion engines, because inhibiting electrolyte flow tends to reduce the current capability.

A common dry cell is the zinc-carbon cell, sometimes called the dry Leclanché cell, with a nominal voltage of 1.5 volts, the same as the alkaline cell (since both use the same zinc–manganese dioxide combination)

48. Option D

An amalgam is an alloy of **mercury** with another metal. Almost all metals can form amalgams with **mercury**, the notable exceptions being **iron**, **platinum**, **tungsten**, and tantalum. **Silver-mercury** amalgams are important in dentistry, and **gold-mercury** amalgam is used in the extraction of **gold** from ore.

49. Option A

The disinfecting action of chlorine is mainly due to the hypochlorous acid, and to a small extent due to the hypochlorite ions.The hypochlorous acid is the most effective form of chlorine for water disinfection. It is more effective (70-80 times) than the hypochlorite ion.

50. Option D

All are correct. Self explanatory.

51. Option D

Barium and strontium are alkaline earth metals in group 2 of the periodic table. They do not occur in the free state. Barium occurs as barytesor heavy spar and as barium carbonate, also called witherite. Strontium is found in combined formas Celestine and stron hanite.

52. Option D

Diamond is a metastable allotrope of carbon, where the carbon atoms are arranged in a variation of the face-centered cubic crystal structure called a diamond.
Marble is a metamorphic rock composed of recrystallized carbonate minerals, most commonly calcite or dolomite. Marble may be foliated.
Sand is a naturally occurring granular material composed of finely divided rock and mineral particles.

53. Option A

Synthetic detergent is any **synthetic** substance, other than soap, that is an effective cleanser and functions equally well as a surface-active agent in hard or soft water. It is a non-soap cleanser that exerts its effect by lowering the surface tension of an aqueous cleansing mixture.Synthetic detergents are used in the case of hard water also because the calcium and magnesium salts of detergents are soluble in water

54. Option C

Aqueous solution of copper sulphate is acidic in nature because copper sulphate on dissolving with water, following chemical reaction takes place $CuSO_4(s) + 2H_2O + Cu(OH)_2(l) + H_2SO_4(aq)$ Now as we can see in above chemical equation the sulphuric acid generated is strong mineral acid which results into increase in acidity of solution. Thus aqueous solution of copper sulphate is acidic in nature.

55. Option C

When ants bite ,they injects formic acid.

56. Option B

Convection can be found in many of the household appliances such as: electric kettle and radiator, refrigerator, air conditioner and so on. In the refrigerator, the freezer (freezing compartment) containing the evaporator, which cools the air is located at the top of the refrigerator. This is so because cold air is more dense than warmer air, so it will sink and the warm air will rise up. Soon, the entire space in the refrigerator will be cooled.

57. Option A

Mixing of water and acid is a highly exothermic process. When water is added to acid , due to small amount of water, evolved heat will change it to vapour and acid will spill out and may cause injury. So it is advised to mix acid to water and not water to acid.

58. Option A

Formic acid is a colorless liquid having a highly pungent, penetrating odor at room temperature. It is miscible with water and most polar **organic** solvents, and is somewhat soluble in hydrocarbons. In hydrocarbons and in the vapor phase, it consists of hydrogen-bonded dimers rather than individual molecules.

59. Option D

The fuel gas from combustion of the fossil fuels is discharged to the air. This gas contains carbon dioxide and water vapor, as well as other substances such as nitrogen oxides (NO_x), sulfur oxides (SO_x), mercury, traces of other metals, and, for coal-fired plants, fly ash.By products of power thermal plant operation need to be considered in both the design and operation. Waste heat due to the finite efficiency of the power cycle must be released to the atmosphere, using a cooling tower, or river or lake water as a cooling medium. The gas from combustion of the fossil fuels is discharged to the air; this contains carbon dioxide and water vapour, as well as other substances such as nitrogen, nitrogen oxides, sulphur oxides, and (in the case of coal-fired plants) fly ash, mercury and traces of other metals.

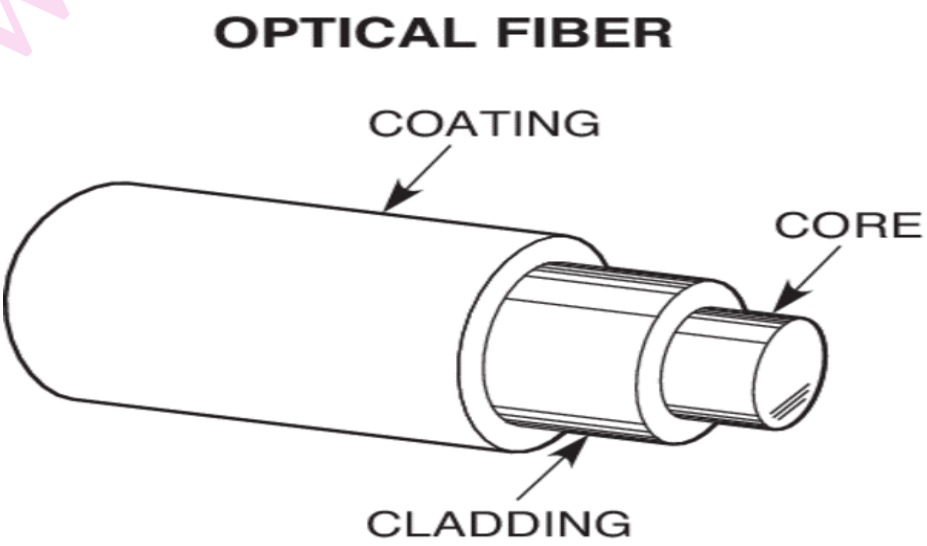
60. Option D

The three primary colours of light, out of which all other colours in the visible spectrum are composed, are red, green and blue. The three secondary colours, created by combining two of the pure primaries, are yellow (from red and green), magenta (from red and blue), and cyan (from blue and green).

The complementary primary–secondary combinations are red–cyan, green–magenta, and blue–yellow. In the RGB color model, the light of two complementary colors, such as red and cyan, combined at full intensity, will make white light, since two complementary colors contain light with the full range of the spectrum.

61. Option C

All others are correct.Outer layer called cladding is glass of lower refractive index.



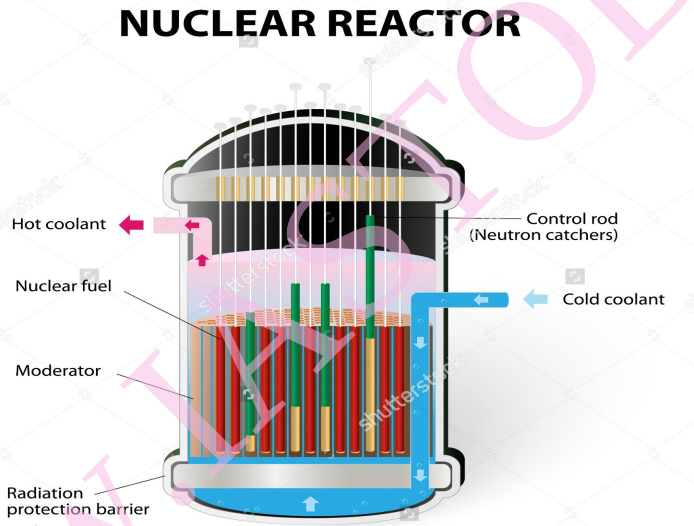
62. Option D

Hardness of water is due to presence of chlorides, sulphates and nitrates of calcium and magnesium. Hard water cannot be used for washing purposes as soap do not form lather with hard water easily which results in to wastage of soap in laundaries.

Moreover use of hard water in industries results in to scale formation in inner layers of boilers on which insoluble calcium and magnesium carbonates gets deposited and being a bad conductor of heat result in to wastage of energy. Also hard water is not fit for drinking purpose as it hinders ionic imbalance in body.Repeated irrigation of crops by hard water increases calcium and magnesium ions in soil which increases soil alkalinity

63.Option A

Generator is not a part of Nuclear reactor;Refer image below.



64. Option B

A **laser** is a device that emits light through a process of optical amplification based on the stimulated emission of electromagnetic radiation. The term "**laser**" originated as an acronym for "light amplification by stimulated emission of radiation".LASER is an optical device & hence 2 is wrong.One of the important property of LASER is Monochromaticity Hence 4 is wrong.

65.Option C

GHG is a **gas** in an atmosphere that absorbs and emits radiation within the thermal infrared range. This process is the fundamental cause of the **greenhouse** effect. The primary **greenhouse gases** in Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.So except oxigen ,all are correct.

66. Option D

Both are wrong.Congenital disease is a problem with the structure and function that is present at birth. Acquired disease is heart disease that develops after birth. There are several types of aquired diseases.Hospital-acquired infection (HAI) — also known as nosocomial infection — is an infection that is contracted from the environment or staff of a healthcare facility. It can be spread in the hospital environment, nursing home environment, rehabilitation facility, clinic, or other clinical settings

67. Option B

The thyroid is a gland in the neck. The thyroid gland creates hormones that affect metabolism. Learn about thyroid diseases, such as hypothyroidism.All others are celestial bodies.

68.Option D

Aspartame is metabolized by the body into two constituent amino acids and methanol. These hydrolysis products are handled by the body in the same way as aspartic acid, L-Phenylanine and methanol from other consumed foods. These components yield NO calory and add nothing new to the diet.

Sucralose is about 600 times sweeter than natural sugar, while asparatame is about 200 times sweeter. Sucralose is not metabolized by the body, hence, there is no further breaking down.

69. Option C

Arthritis is very common but is not well understood. Actually, “arthritis” is not a single disease; it is an informal way of referring to joint pain or joint disease.Arthritis symptoms include pain, joint inflammation, and swelling. Get the facts on arthritis diet, treatment, and medications.

70. Option D

Medical Definition of acquired immunity. : immunity that develops after exposure to a suitable agent as developed during life time. (as by an attack of a disease or by injection of antigens)—compare active immunity, innate immunity, passive immunity.

Innate immunity refers to nonspecific defense mechanisms that come into play immediately or within hours of an antigen's appearance in the body. These mechanisms include physical barriers such as skin, chemicals in the blood, and immune system cells that attack foreign cells in the body.

71. Option D

The main chemicals in air pollution that create acid rain are sulfur dioxide (SO2) and nitrogen (NOx). Acid rain usually forms high in the clouds where sulfur dioxide and nitrogen oxides react with water, oxygen, and oxidants. this mixture forms a mild solution of sulfuric acid and nitric acid.These substances can rise very high into the atmosphere, where they mix and react with water, oxygen, and other chemicals to form more acidic pollutants, known as acid rain.

Power plants release the majority of sulfur dioxide and much of the nitrogen oxides when they burn fossil fuels, such as coal, to produce electricity. In addition, the exhaust from cars, trucks, and buses releases nitrogen oxides and sulfur dioxide into the air. These pollutants cause acid rain.

72. Option A

The alpha particle is a helium nucleus; it consists of two protons and two neutrons. It contains no electrons to balance the two positively charged protons. Alpha particles are therefore positively charged particles moving at high speeds. Beta particles are emitted by neutron rich unstable nuclei.

Gamma rays are emitted by most radioactive sources along with alpha or beta particles. After alpha or beta emission the remaining nucleus may still be in an excited energy state. By releasing a gamma photon it reduces to a lower energy state. Gamma rays have no electrical charge associated with them.where **beta is negatively charged.**

X-rays is a form of electromagnetic radiation. Most **X-rays** have a wavelength ranging from 0.01 to 10 nanometers, corresponding to frequencies in the range 30 petahertz to 30 exahertz (3×10^{16} Hz to 3×10^{19}

Hz) and energies in the range 100 eV to 100 keV.

73. Option D

Radioactive elements means that they break down over time by releasing energy and turning into different elements. Let's look next at how this process happens. All elements except option D have radioactive isotopes.
Alpha decay releases the largest particle released during radioactive decay which are made of two neutrons and two protons. This type of decay ejects the subatomic particles very quickly, which can damage our cells if they get into our body.
Beta decay occurs when one proton turns into a neutron inside the nucleus and one electron is released. Alpha decay often creates unstable isotopes that undergo beta decay as well.
In **gamma decay** no particles are released, but the isotopes formed by alpha and beta decay still have too much energy. The energy is released as gamma rays.

74. Option D

Osmosis is a process by which molecules of a solvent tend to pass through a semipermeable membrane from a less concentrated solution into a more concentrated one.
Reverse osmosis is a process by which a solvent passes through a porous membrane in the direction opposite to that for natural osmosis when subjected to a hydrostatic pressure greater than the osmotic pressure.

75. Option B

The heaviest metal on the periodic table of elements is **osmium**. Its density is 22.57 grams per cubic centimeter, which is twice that of the element lead. A quarter-gallon of osmium weighs 50 pounds when compared to a quarter-gallon of water, which weighs only 2.2 pounds.

Under standard conditions, **Lithium is the lightest metal** and the least dense solid element. Like all alkali metals, **lithium** is highly reactive and flammable.