

NDA I 2021: GAT Solution

1. Ans. C.

The most appropriate synonym for sardonic is **mocking** which means making fun of someone or something in a cruel way.

Compassionate means feeling or showing sympathy and concern for others.

Insightful means having or showing an accurate and deep understanding.

Comic means causing or meant to cause laughter.

2. Ans. B.

The most appropriate synonym for replica is clone which means to create a product that is very similar to another one.

Pride means the quality or state of being proud.

Love means an intense feeling of deep affection.

Original means real.

3. Ans. C.

The most appropriate synonym for reconnaissance is investigation which means the action of investigating something or someone.

Revaluation the action of assessing the value of something again.

Ratification means a principal's approval of an act of its agent that lacked the authority to bind the principal legally.

Regularization means the condition of having been made regular.

4. Ans. C.

The most appropriate synonym for arrogance is **conceit** which means excessive pride in oneself.

Concern means a feeling of worry or care about a person or thing.

Unpretentiousness means not pretentious; modest.

Simplicity means the state or quality of being simple.

5. Ans. D.

The most appropriate synonym for patron is **backer** which means a person, institution, or country that supports someone or something, especially financially.

Entrepreneur means an individual who creates a new business.

Admirer means a person who has a particular regard for someone or something.

Critique means a detailed analysis and assessment of something, especially a literary, philosophical, or political theory.

6. Ans. B.

The most appropriate synonym for oratory is **eloquence** which means fluent or persuasive speaking or writing.

Deceit means the act of causing someone to accept as true or valid what is false or invalid.

Looks means direct one's gaze toward someone or something or in a specified direction.

Nobility means the quality of being noble in character.

7. Ans. A.

The most appropriate synonym for organic is **natural** which means existing in or derived from nature.

Speedy means done or occurring quickly.

Unusual means not habitually or commonly occurring or done.

Disciplined means showing a controlled form of behavior or way of working.

8. Ans. B.

The most appropriate synonym for lamenting is **bemoaning** which means express discontent or sorrow over (something).

Celebrating means to express admiration and approval for something or someone.

Blaming means feel or declare that (someone or something) is responsible for a fault or wrong.

Making means to create something.

9. Ans. C.

The most appropriate synonym for dynamic is **evolutionary** which means relating to the gradual development of something.

Enduring means long-lasting.

Attentive means paying close attention to something.

Jealous means feeling or showing an envious resentment of someone or their achievements.

10. Ans. D.

The most appropriate synonym for contagious is **catching** which means (of a disease) infectious.

Arrogant means unpleasantly proud and behaving as if you are more important than other people.

Disrespectful means showing a lack of respect or courtesy.

Sarcastic means using remarks that clearly mean the opposite of what you say, in order to hurt someone.

11. Ans. C.

The most appropriate antonym for crooked is straightforward which means direct in your approach.

Polite means having or showing behavior that is respectful and considerate of other people.

Generous means showing a readiness to give more of something.

Happy means feeling or showing pleasure or contentment.

12. Ans. D.

The most appropriate antonym for rarely is frequently which means that occurs often or at frequent intervals.

Seldom means almost never.

Never means at no time in the past or future.

Always means at all times.

13. Ans. A.

The most appropriate antonym for grow is shrivel which means to become dry, smaller, and covered with lines as if by crushing or folding.

Stretch means to reach across a distance or become longer or wider.

Spread means extend over a large or increasing area.

Enlarge means make or become larger or more extensive.

14. Ans. C.

The most appropriate antonym for industrious is lazy which means unwilling to work or use energy.

Active means engaging or ready to engage in physically energetic pursuits.

Productive means causing or providing a good result or a large amount of something.

Disloyal means not loyal.

15. Ans. B.

The most appropriate antonym for plenty is scarcity which means the state of being scarce or in short supply.

Ugliness means the quality of being unpleasant or repulsive in appearance.

Roughness means the quality or state of having an uneven or irregular surface.

Dryness means absence or lack of moisture or liquid.

16. Ans. A.

The most appropriate antonym for generous is stingy which means not generous.

Rough means having an uneven or irregular surface.

Evil means profoundly immoral and wicked.

Hostile means showing or feeling opposition or dislike.

17. Ans. D.

The most appropriate antonym for deep is shallow which means of little depth.

Dark means with little or no light.

Light means provide with light or lighting.

Dangerous means able or likely to cause harm or injury.

18. Ans. B.

The most appropriate antonym for clear is opaque which means not letting light through.

Bright means giving out or reflecting much light.

Cloudless means clear and free of cloud.

Blue means melancholy, sad.

19. Ans. D.

The most appropriate antonym for boundless is finite which means having definite or definable limits.

High means of great vertical extent.

Vast means of very great extent or quantity.

Expansive means covering a wide area in terms of space or scope.

20. Ans. C.

The most appropriate antonym for attractive is repulsive which means arousing intense distaste or disgust.

Unnatural means contrary to the ordinary course of nature.

Modern means relating to the present or recent times as opposed to the remote past.

Disapproving means expressing an unfavorable opinion.

21. Ans. C.

'**Knew**' is the correct usage.

22. Ans. A.

'Staunch' is the correct usage.

A **staunch** supporter or **believer** is very loyal to a person, organization, or set of beliefs, and supports them strongly.

23. Ans. B.

Gullible means easily persuaded to believe something; credulous.

'Gullible' is the correct usage.

24. Ans. C.

'**Normally**' is the correct usage.

25. Ans. D.

'**Declared**' is the correct usage.

Declared means openly or formally asserted or announced.

26. Ans. C.

'**Sequel**' is the correct usage.

A Sequel is a continuation or part two.

27. Ans. A.

'Trumpet' is a correct usage.

Hence, option A is the correct answer.

28. Ans. C.

'terrifying' is the correct usage.

Terrifying means causing extreme fear.

29. Ans. A.

'Disappointed' is the correct usage.

30. Ans. B.

'Polity' is the correct usage. Polity is a group of people where they have a fixed political organization.

Hence, option b is the correct answer.

31. Ans. D.

Give somebody a leg up means **to help someone to be successful.**

Hence, option D is the correct answer.

32. Ans. B.

A hunky-dory situation means **there are no problems and people are happy.**

Hence, option B is the correct answer.

33. Ans. B.

Fire in the belly means **powerful ambition.**

Hence, option B is the correct answer.

34. Ans. C.

A clarion call means **a strong request.**

Option C is the correct answer.

35. Ans. A.

Turn topsy turvy means **to completely change something.**

Hence, option A is the correct answer.

36. Ans. C.

To get under somebody's skin means **to annoy someone**.

Hence, option C is the correct answer.

37. Ans. B.

Pull your socks up means **improve your work or behavior**.

Hence, option B is the correct answer.

38. Ans. A.

Open a Pandora's box means **to do something that causes a lot of new problems that you did not expect**.

Hence, option A is the correct answer.

39. Ans. A.

Palsy – walsy friends means **good friends**.

Hence, option A is the correct answer.

40. Ans. C.

Overstep the mark means to upset someone by doing/ saying more than you should.

Hence, option C is the correct answer.

41. Ans. D.

The given sentence is error free.

Option D is the correct answer.

42. Ans. A.

The error is in part A of the given sentence.

43. Ans. B.

The error is in part B of the given sentence.

The tense used in the sentence is incorrect.

Present perfect tense or continuous tense can be used instead of present perfect continuous tense.

44. Ans. B.

The error is in part B of the given sentence.

Though and but are contrasting conjunctions.

Remove 'but' from part B.

45. Ans. A.

The error is in part A of the given sentence.

'Pointing out' is the correct usage.

46. Ans. C.

The error is in part C of the given sentence.

The correct preposition will be '**of**' instead of 'from'.

47. Ans. C.

The error is in part C of the given sentence.

'of' will not be used with comprising.

48. Ans. C.

The error is in part C of the given sentence.

The correct usage is – **Point blank**.

Point blank means - direct, blunt a **point-blank** refusal.

49. Ans. C.

The error is in part C of the given sentence.

When you are talking about someone, it's singular, so pronoun used should be 'he' instead of 'they' and 'has' should be used instead of 'have'.

50. Ans. C.

The error is in part C of the given sentence.

'don't' will not be used. (Avoid double negative).

51. Ans. B.

Biomass can be defined as plant or animal matter which is used for energy production or in various industrial applications as a raw material for producing a variety of products. It is a renewable source of energy. It contains stored energy from the sun. It can be burned directly or converted to liquid biofuel or biogas and can be burnt as fuels.

Gobar Gas: In India, Biogas is known as Gobar gas which is produced by anaerobic digestion with methanogen or anaerobic organisms that can digest material inside a closed system of biodegradable materials.

Nuclear Energy: It is a non-renewable source of energy generated from the nucleus of an atom. Nuclear fission happens when the nuclei of atoms are joined together. Nuclear power plants generate electricity by using nuclear fission. Hence, it is not a biomass energy source.

Wood: It is found in the stems and roots of the trees and it can obtain from other woody plants also. This is a porous and fibrous structural tissue. It is a natural biomass resource because it belongs to plants or trees.

Coal: It is a flammable sedimentary rock that is formed from rocks strata called coal seams. It is mostly made up of carbon with variable amounts of other elements such as hydrogen, sulphur, oxygen, and nitrogen. It is classified as a non-renewable resource of energy because it takes millions of years to form.

52. Ans. D.

When quicklime is added to water, it results in the formation of slaked lime along with the evolution of heat. This is an example of an exothermic reaction. There will be a rise in the temperature.

Calcium hydroxide is formed on the reaction of calcium oxide with water. Calcium hydroxide is also called slaked lime.

53. Ans. C.

Rutherford conducted an experiment in which he bombarded a thin sheet of gold with alpha particles and then studied their trajectory after their interaction with the gold foil. He directed high energy streams of alpha particles from a radioactive source at a thin sheet of gold. To study the deflection caused by these particles, he placed a fluorescent zinc sulphide screen over the thin gold foil. Conclusions of his experiments are:

1. passed through the gold foil without getting deflected.
2. Very few particles were deflected from their path, indicating that the positive Most of the space inside the atom is empty because most of the α -particles
3. Atomic charge occupies very little space.
4. A minute fraction of α -particles were deflected by larger angles, which indicates all the positive charge and mass of the gold atom were concentrated in a very small volume inside the atom.

From the experimental data, he concluded that the radius of the nucleus is about 10^5 times less than the radius of the atom.

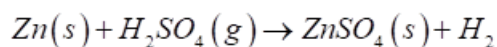
Electrons move in a circular path of fixed energy called orbits because it does not explain anything about an atom's stability, its electronic structures, its energies, and distribution around the nucleus.

54. Ans. C.

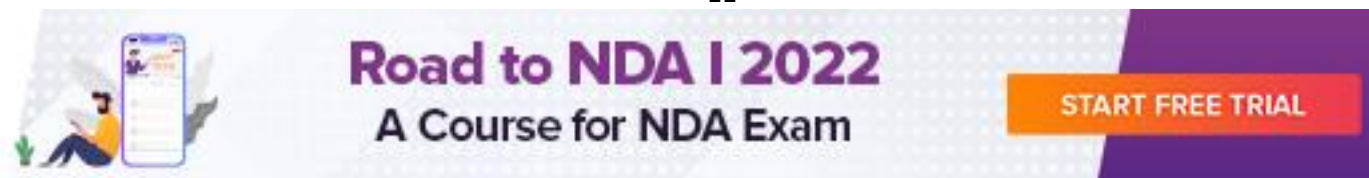
Tomatoes are a widely used vegetable in our daily life. Fresh ripe fruits are refreshing, appetizing, and are consumed raw in salads. Unripe fruits are cooked to add flavour to food. These are consumed in the form of juice, paste, ketchup, sauce, soup, and powder also. This is essentially an alkaline vegetable; its acidic taste is due to malic acid which is about 0.5% it also contains 0.52 & 1.81 citric acid and only a trace of oxalic acid is present.

55. Ans. B.

(a) When zinc metal reacts with dilute sulphuric acid, zinc sulphate and hydrogen gas is evolved.

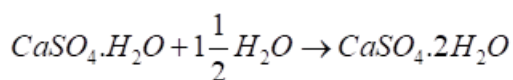


(b) On mixing with water, Plaster of Paris ($\text{CaSO}_4 \cdot \text{H}_2\text{O}$) changes into gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) which sets into a hard mass in about half an hour.

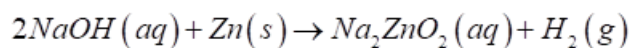


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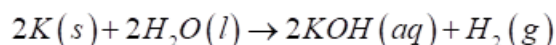
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(c) If sodium hydroxide solution gets heated with zinc granules then Sodium zincate and hydrogen gas are formed.



(d) Potassium metal reacts instantly with water to form a colourless basic solution of potassium hydroxide (KOH) and hydrogen gas (H_2).



56. Ans. C.

Diamond, graphite and fullerenes are the three allotropes of pure carbon.

Diamond is made of more 3-dimensional molecules. All the layers are bonded together to form a stronger but not conductive material. It is made up of only carbon atoms, so it is an allotrope of carbon. It demonstrates the highest hardness and thermal conductivity of any bulk substance. Also, its rigid lattice prevents contamination. Its surface is said to be lipophilic and hydrophobic, which means that it does not get wet by water but can be in oil. These do not usually react with any other chemical reagents, including strong acids and bases. Uses of diamond include cutting, drilling, and grinding; jewellery; and in the semiconductor industry.



Graphene is a single layer of carbon atoms that are arranged in a single plane and these layers form graphite. Graphene is a material of interest because of its high electron mobility and its practical applications in the electronics field. It is a good electrical conductor and a semi-metal. Graphite is considered as the most stable allotrope of carbon based on standard conditions and its uses in thermochemistry as the standard state defines the heat of formation of carbon compounds.





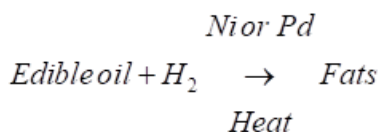
Fullerenes are a carbon allotrope, in which carbon takes the shape of a hollow sphere, ellipsoid, or tube. This type of materials incorporates carbon nanotubes, buckyballs, and the recently discovered nanobuds.



Coal fly ash included different rich sources of organic carbons such as polycyclic and polyaromatic hydrocarbons that are used in numerous industries. This is used for the development of carbon derived value-added materials and nanocomposites, but it is not considered as an allotrope of carbon.

57. Ans. C.

Hydrogenation of vegetable oil has been processed for over a hundred years. The process was originated to convert a few of the unsaturated fatty acids into vegetable oils. Oils are unsaturated compounds that contain double bonds. Addition reactions are the characteristic property of unsaturated hydrocarbons. Hydrogenation of oils occurs in the presence of palladium or nickel as a catalyst to form fat. This reaction is known as the addition reaction. The reaction of hydrogenation is given below:



58. Ans. B.

The particles of soap made up of sodium or potassium salts of long-chain carboxylic acids. During the process of washing, the carbon chain gets easily dissolved in oil and the ionic end dissolves in water. The soap molecules form structures during the process which are called micelles. One end of a micelle is towards the oil droplet and the other end, which is the ionic, faces outside. Therefore, it forms an emulsion in water and helps



to remove the dirt or stains when we wash our clothes. When the soap is in the form of micelles, at that moment it can wash away the oily dirt or stain which gets accumulated at the centre. These micelles remain as colloidal solutions. Hence, the dirt from the cloth is getting washed away. The soap solution appears cloudy because it forms a colloidal solution that scatters light. But this scattered light does not have any role in the cleansing action of soap. Both calcium and magnesium ions present in hard water which reacts with the higher fatty acids of soap that forms an insoluble gelatinous curd; hence it causes a waste of the soap.

59. Ans. D.

When mixing coloured lights, multiple colours add together to form a chord, which we detect as a new colour. The non-absorbed frequencies are bounced back and perceived as colour. Mixing different colours means lesser frequencies are reflected, and we perceive the resulting colour after this subtraction occurs.

(a) Blue colour is obtained by the combination of cyan and magenta colours.

(b) Magenta colour is obtained by the combination of red and blue colours.

(c) Pink colour is obtained by the combination of red and white colours.

(d) Yellow colour is obtained by the combination of green and red colours.

Hence, option D is correct.

60. Ans. C.

Washing soda: The soda, which is produced from common salt. On heating sodium hydrogen carbonate, the re-crystallization of sodium carbonate produces washing soda.

Its formula is $Na_2CO_3 \cdot 10H_2O$.

Baking soda: It is generally used as an ingredient in the kitchen for making delicious items. Sodium chloride is used as a raw material to produce it. Its formula is $NaHCO_3$.

Bleaching powder: It is used as a disinfecting substance in water to make it free from germs. It is also used to produce cotton in the textile industry. Chlorine gas obtained is used for making it. Its formula is $Ca(ClO)_2$.

Plaster of Paris: This is used to make sculptures and metal castings which is used as decorative pieces in buildings. It is used in buildings to avoid fire hazards as a fire-resistant. It is generally used as a coating on wood and metal structures to avoid any fire accidents. Its formula is $(CaSO_4)_2 \cdot H_2O$.



61. Ans. D.

The degree Celsius is a unit of temperature on the Celsius scale which is used to indicate a difference or range between two temperatures. Absolute zero or zero kelvins is equal to -273°C and marks the spot on the thermometer where a system reaches its lowest possible energy or thermal motion. Thus, -273°C is the lowest possible temperature.

62. Ans. D.

(a) Valency of

Na- 1

Ca- 2

Mg- 2s

Hence, it is incorrect.

(b) Valency of

Na- 1

Mg- 2

Al- 3

Hence, it is incorrect.

(c) Mg- 2

Ca- 2

K- 1

Hence, it is incorrect.

(d) Mg- 2

Ca- 2

Ba- 2

Hence, it is correct.

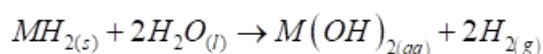


63. Ans. D.

Hydrogen is collected by lower displacement of water because it is less dense than water, so, it comes out at the surface of the water. It is insoluble in water. In the case of displacement with air, hydrogen is 14.5 times lighter than air.

For Hydrogen to react, the H-H bond has to break, which requires energy because that bond is large, breaking of the H-H bond is difficult at room temperature which makes hydrogen inert.

Except for beryllium (Be), the alkaline metal hydrides react with water to produce the metal hydroxide and evolved hydrogen gas. The reaction of these metal hydrides with water:



Synthetic gas is also known as syngas, which is mainly composed of a mixture of hydrogen, carbon monoxide and sometimes carbon dioxide. It is an artificially produced version of natural gas. We can produce this gas by gasifying any carbon-containing mass like coke, coal and biomass which is then converted into methane which is the major component of natural gas.

64. Ans. C.

Solder is a fusible metal alloy with a melting point range of $90 - 450^\circ\text{C}$, which is used in a process called soldering where it is melted to join metallic surfaces. It is especially useful in electronics and plumbing. Alloys that melt between 180° and 190°C are the most commonly used. Solder is an alloy of tin and lead. These alloys have characteristic weight percentages. Solder is having 63% tin and 37% lead.

65. Ans. B.

The process of purifying the crude metals is known as refining. A large number of metals such as copper, silver, aluminium, zinc, etc. are refined by the method of electrolytic refining. During the process, impure metal is considered as the anode and the cathode is made up of a pure strip of the same metal. Blister copper is the crude metal which is present in the impure form of copper-containing sulphur, so it is made anode. A thin sheet of pure copper is made on the cathode while copper sulphate solution acidified with sulphuric acid is taken as the electrolyte for refining. When electric current flows through it, impure copper from the anode dissolves and moves into the copper sulphate solution and pure copper from copper sulphate deposits on the cathode. As a result, pure copper metal is produced on the cathode.



At anode: $Cu(s) \rightarrow Cu^{2+}(aq) + 2e^{-}$

At cathode: $Cu^{2+}(aq) + 2e^{-} \rightarrow Cu(s)$

66. Ans. D.

Glass is a solid and transparent material that is used in our daily life. It is generally made up of natural and abundant raw materials such as sand, soda ash, alumina, borax, and limestone. These raw materials are heated to get melted at very high temperature to form a new product that is glass. At high temperature, Gypsum is having good importance as a raw material in the production of cement and plaster for the building industry.

67. Ans. B.

Hypobromous acid is a weak, unstable acid whose chemical formula is HOBr. It is predominantly produced in an aqueous solution. It is generated as a disinfectant both biologically and commercially. Salts of hypobromite are hardly isolated as solids. HOBr is commercially used as a bleach, an oxidizer, a deodorant, and a disinfectant because it can kill the cells of many pathogens.

68. Ans. D.

Photoelectric effect was discovered by Albert Einstein. It is the emission of electrons when electromagnetic radiations hit a material. Electrons released in this pattern are known as photoelectrons.

Neutron was invented by James Chadwick in 1932, he performed an experiment in which he bombarded Beryllium with the alpha particles from the natural radioactive decay of Polonium.

Radium was discovered by Marie Curie and her husband Pierre Curie on 21 December 1898 from an ore mined at Jachymov. Radium is a chemical element whose symbol is Ra, and its atomic number is 88. It is an alkaline earth metal. All isotopes of radium are highly radioactive.

69. Ans. A.

Chemical weathering decomposes, dissolves, alters or weakens the rock through various chemical processes to form residual materials. Various chemical weathering processes, such as solution, hydration, hydrolysis, carbonation, oxidation, reduction, and chelation occur on the surface of Earth. Among these, some reactions occur more easily when the water is slightly acidic.



Carbonation: It is a process by which carbon dioxide and water chemically react to produce carbonic acid, a weak acid, which reacts with carbonate minerals in the rock. It weakens the rock and removes the chemically weathered minerals. It occurs in wet, moist climates and affects rocks above and beneath the surface. It occurs with limestone or dolomite rocks and usually produces very fine clayey particles.

Hydrolysis: It is a chemical reaction between and ions in water and the minerals in the rock. The ion in the water reacts with the minerals to produce weak acids. It produces new mineral compounds which likely to be softer and weaker than the original parent rock material. It can cause certain minerals to expand, which also facilitates mechanical weathering processes. It commonly affects igneous rocks because they are composed of silicate minerals, such as quartz, which is readily combined with water. It may be accompanied by hydration and oxidation.

Hydration: It is a process where mineral structure in the rock forms a weak bond with water. Natural Mineral grains expand, and increased stress promotes the disintegration of the rock. It allows changing the colour in the weathered rock surface. It also accelerates other weathering processes with hydrolysis and oxidation.

Oxidation: It occurs when an ion in a mineral structure loses an electron to an oxygen ion. This is common in iron-bearing, rock-forming minerals. It promotes rock decay, furnishing it more vulnerable to other forms of weathering.

70. Ans. B.

The correct sequence of the pollen tube pathway is Stigma, style, and ovary.

Stigma- It is located on the tip of the style forms the head of the pistil. It contains a sticky substance to catch pollen grains from different pollinators. Stigma is responsible to commence the process of fertilization.

Style- It is a long slender stalk that holds the stigma, it forms a pollen tube when pollens reach the stigma and carries pollens to the ovaries to enable fertilization.

Ovary- It forms the base of the pistil. The ovary holds the ovules.

71. Ans. A.

The radicle is part of a seedling that emerges from the seed first during the phenomenon of germination. The radicle is the embryonic root of the plant and it grows downward in the soil. Inside the seed, it is an embryonic root. The Plumule is an embryonic shoot of the plant and it develops after the radicle. Cotyledons are the primary parts of a seed to seem above the bottom when it begins to grow. Epicotyl is that the part of the embryonic Axis which lies above the purpose of attachment of cotyledons.



72. Ans. A.

Experiment -1 ie. When Vaseline/ vegetable oil was applied on the upper surface of the leaf then the pores ll get block but as the stomata are located in the lower side of the leaves in major it won't disturb the gaseous exchange of the plant, and it will reduce the water loss of the plant thus although it will make the plant unhealthy it will survive.

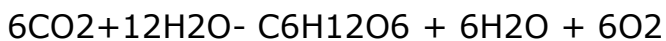
-Experiment 2- stomata are located under the leaves of the plant, therefore Vaseline/ vegetable oil that was applied on the lower side of the leaf will completely block the gaseous exchange and eventually prevent photosynthesis and transpiration resulting in the death of the plant.

-All the leaves will not dry up cumulatively as the Vaseline or vegetable oil was applied on the experimental leaf resulting in the blockage of transpiration from just that single leaf of the plant.

73. Ans. C.

Two major processes occurring in plants are, Photosynthesis and Respiration; these are the vital processes on the plants which involve the formation of a gaseous product and energy. During photosynthesis, carbon dioxide is used to make glucose, and oxygen gets released.

Photo synthesis reaction



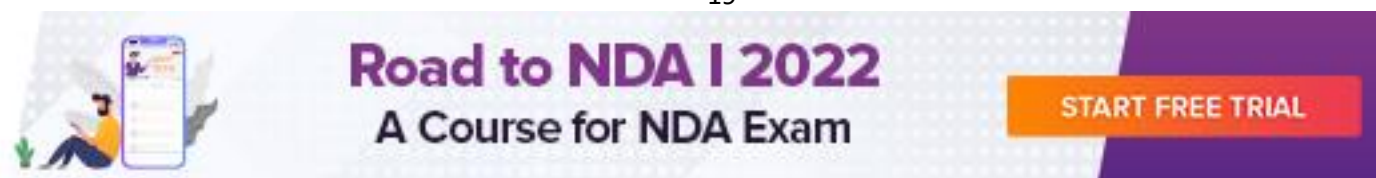
The newborn oxygen here is used for respiration and glucose is used for the release of energy.

Respiration chemical equation



Respiration and nitric oxide

Respiration is the process in which glucose and oxygen combine to make energy. Nitric oxide plays an important role as a signaling molecule and a cytotoxic agent. The process of water movement from the aerial parts of the plants is known as transpiration. The water gets evaporated eventually to the atmosphere via plants stomata in the form of water vapor. The process of planting a seed in the soil in favorable conditions with water and nutrition results in the formation of that seed into a seedling and that seedling eventually grows to form a plant. This growth process of a plant from a seed is known as Germination. Carbon dioxide fertilization is responsible for at least 80% of



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photosynthesis. The concentration of carbon dioxide is proportional to the productivity of the plants.

74. Ans. A.

The permanent tissues are always different from the meristematic cells, during the process of growth. These meristematic cells lose the power to divide and take up a selected role. This process of taking over a permanent shape, function and size is named cellular differentiation. Cell division is the process in which a parent cell divides into two or more daughter cells. Cell multiplication is the process of making new body cells. Regeneration is a natural process of restoring damaged or replacing or missing cells, organs, tissues, and entire body parts to full function in plants and animals.

75. Ans. A.

Stratified squamous epithelium found as the lining of the mouth, esophagus, and including blood vessels and in the alveoli of the lungs because this epithelium is normally not exposed to dryness or abrasion, it is non keratinized. The small intestine is an organ in the gastrointestinal tract where most of the and absorption of nutrients and minerals from food take place. The ducts of salivary glands allow the passage of salivary juice from the glands to the mouth. The function of the kidney is to filter the blood.

76. Ans. C.

Mitochondria are double membrane-bounded cell organelles. The inner mitochondrial membrane transduces energy through the organic process and liable for the assembly of energy within the sort of ATP. It forms invaginations called cristae, which extend deeply into the matrix. The outer mitochondrial membrane surrounds the inner membrane and it has so many protein-based pores which are big enough to allow a passage of ions and molecules as large as a small protein. The Matrix contains DNA of the mitochondrial genome and enzymes of the Krebs cycle which further metabolizes nutrients into by-products so that mitochondria can use it for energy production. The function of mitochondrial DNA is to convert chemical energy from food into a form in that cells can use ATP.

77. Ans. D.

The Endoplasmic reticulum is an organelle that consists of a network of membranes within the cytoplasm of eukaryotic cells which is important for protein synthesis, folding and is involved in the transport of cellular materials. It can be continuous in places with the membrane of the cell nucleus. The function of ribosomes is to translate all the encoded information from the nucleus provided by ribonucleic acid. The function of mitochondria is to perform cellular respiration and to form ATP. Lysosomes functions are



digestion of macromolecules, cell membrane repairs, and responses against bacteria, viruses, and other antigens.

78. Ans. C.

The major source of vitamins and minerals for vegetarians is vegetables and fruits, water-soluble vitamins like vitamin C, vitamin B, and folic acid are mainly found in vegetables and fruits. Grains and milk and dairy foods, vitamins, and minerals are considered essential nutrients because they perform hundreds of roles in the body. They help prop up bones, heal wounds and bolster the system. They convert food into energy and help cellular damage. Black gram and wheat hold a high protein value and source of dietary fiber, vitamin B complex, iron, copper calcium, magnesium, zinc, potassium, phosphorus. Mustard and soybean are the source of nutrients, calcium, copper, and vitamin C, And K. Rice is a good source of vitamins and minerals. It helps the blood transport oxygen and performs other vital functions.

79. Ans. A.

A red blood cell does not have a rigid cell wall and it will swell and burst when placed in a hypotonic solution, but once the cell is turgid the tough cell membrane prevents any longer water from entering the cell.

80. Ans. B.

For a simple harmonic oscillator, Force acting should be directly proportional to the displacement from the mean position and in opposite direction.

Let the force acting be F and displacement be x , then $F = -kx$ for simple harmonic motion. This means that there should be restoring force acting on the body.

81. Ans. D.

Light waves are incident on an air-glass parts boundary. Some of the light waves are reflected and some are refracted in the glass.

The speed of the reflected part remains the same, while that of refracted part varies according to the nature of the medium.

Whether in reflection or refraction, direction changes because of reversal at the same angle from normal and bending respectively.

Brightness also differs, it depends on the reflecting surface or refracting boundary, that how opaque or transparent reflecting surface or medium is.

But the frequency does not change as it depends upon the source which has generated the wave.

82. Ans. D.

Beats are the gradual loudening and softening of sound when two sounds waves of similar frequencies interfere constructively or destructively.

83. Ans. A.

Frequency is the number of complete waves generated in one second. Mathematically, it is the reciprocal of the period. A period is a time taken by a wave to complete one

revolution or to complete one complete cycle i.e. $f = \frac{1}{T}$, where f is the frequency and T is the time period. therefore, from the formula, the unit of frequency can be s^{-1} , also it can be min^{-1} . Hertz or Hz is another unit of frequency.

Decibel or dB is the unit of measuring sound, more precisely the intensity of sound.

84. Ans. C.

The twinkling of stars is due to the atmospheric refraction of starlight. Light coming from stars bends towards the normal and results in continuous variable apparent shifts due to variance in the atmospheric constitution. Since the atmosphere varies with time, its refractive index changes, hence refraction occurs at a variable state, hence twinkling of stars is seen.

85. Ans. B.

When light is scattered by a molecule and the frequency of the scattered light is changed this phenomenon is called Raman Effect.

In Rayleigh scattering, light is scattered by a molecule and the frequency of the scattered light does not change.

The emission of electrons when electromagnetic radiation, such as light, hits a material is known as the photoelectric effect.

Rutherford scattering was related to alpha particle scattering on gold foil.

86. Ans. A.

The sound created in a big hall persists because of the repeated reflections. This phenomenon is called reverberation.

A glass prism splits white light into different colors. This phenomenon is called the dispersion of light.

Refraction states that when light travels from one medium to another it bends, while traveling from rarer to denser, it bends towards the normal whereas while traveling from denser to rarer, it bends away from the normal.

Diffraction is the bending of light around a particle when the size of a particle is smaller than the size of a photon (light ray).

87. Ans. B.

Electrical power is the product of applied potential difference and current in a circuit. Mathematically,

$$P = V \times I$$

Where P is the power, V is the applied potential difference, I is the current

According to ohm's law, $V = I \times R$, where V is the applied potential difference, I is the current and R is the resistance of the circuit.

$$\text{now, } P = V \times I \text{ and } V = I \times R$$

$$\text{therefore, } P = (I \times R) \times I = I^2 R$$

$$\text{also } I = \frac{V}{R} \text{ and } P = V \times I$$

$$\text{therefore, } P = V \times \frac{V}{R} = \frac{V^2}{R}$$

Hence options A, C and D is correct

88. Ans. C.

Given current (I) = 1.0A

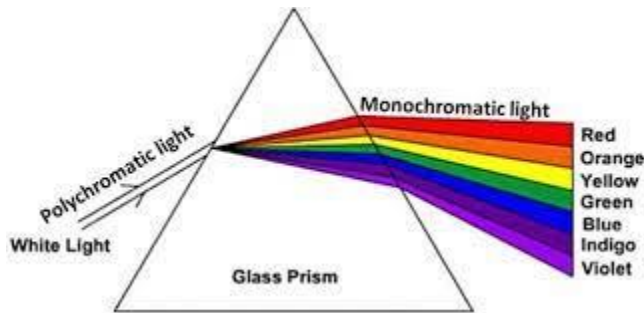
Time (t) = 10minutes = 10x60 = 600 seconds

Now, charge (Q) = $i \times t = 1 \times 600 = 600$ coulombs

Hence option C is correct.

89. Ans. B.

A glass prism splits white light into different colors. This phenomenon is called the dispersion of light by a prism. Red light deviates the least because of the refraction of light while Violet light will deviate the most because of the refraction of light. It happens due to a change in speed since each color has its wavelength. The wavelength of red light is more than violet, and as we know that $v = f\lambda$, the speed of red light is greater than violet, so it deviates less than violet. Where v is the speed of light, f is the frequency, λ is the wavelength.



Hence option B is correct.

90. Ans. C.

Light travels at the speed of $3 \times 10^8 \text{ m/sec}$ in vacuum or in air, in other words, Light travels at almost 300 million meters per second in air. But its speed changes as the medium changes in which it is traveling, in a denser medium it travels with comparatively low speed while in a rarer medium it travels with greater speed. A denser medium is one in which the speed of light is slower while the rarer is one in which the speed of light is fast. The concept of rarer – denser comes in pair when light travels from one medium to another. Since water is denser than air, so its speed decrease when it leaves a water surface and enters the air. Glass is also denser than air, so its speed increases when it leaves a glass surface and enters the air.

91. Ans. A.

$$\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$$

The given equation $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$ is mirror formula and is applicable for spherical mirrors as well as a plane mirror but only for reflection; where v is image distance from the mirror, u is object distance from the mirror, and f is the focal length of the mirror. Hence option A is correct.

92. Ans. B.

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Green, blue, and red are the primary colors of light in physics. A mixture of two can primary colors of light can make yellow, magenta, or other secondary colors. These colors are called primary because they are the basis of other colors and are not made up by mixing of two colors.

93. Ans. D.

Mirage is an illustration of both refraction and total internal reflection of light. It happens when the surface is hot and the air is cool. The surface heats the above atmosphere resulting in the first bending of light then gradually reflecting internally.

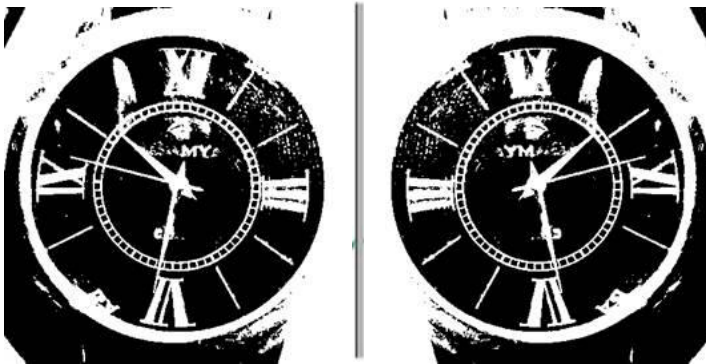
94. Ans. B.

Law of refraction states that when light travels from one medium to another it bends while traveling from rarer to denser, it bends towards the normal whereas while traveling from denser to rarer, it bends away from the normal, but in both cases, if the ray is falling normally then it goes without any deviation or makes 0° angle with the normal and passes straight throughout the medium.

Hence, option B is correct.

95. Ans. C.

A plane mirror forms a virtual, erect, laterally inverted image of the same size of an object. Virtual means we cannot obtain that image on a screen, laterally inverted means, left-hand side of object becomes the right-hand side of image and vice versa. An example is shown below



Object plane image

mirror

hence option C is correct.

96. Ans. A.

The interconversion equation between Celsius scale and Fahrenheit scale is mathematically given by

$$t_F = 32^{\circ} + \frac{9}{5} \times t_c$$

Where t_f is the temperature in Fahrenheit, t_c is the temperature in Celsius.

Therefore, let the temperature at which both scales show the same reading be T , then

$$T = 32^{\circ} + \frac{9}{5} \times T$$

$$\frac{9}{5}T - T = -32$$

$$\frac{9T - 5T}{5} = -32$$

$$4T = -32 \times 5$$

$$T = \frac{-160}{4} = -40^{\circ}$$

Hence, option A is correct.

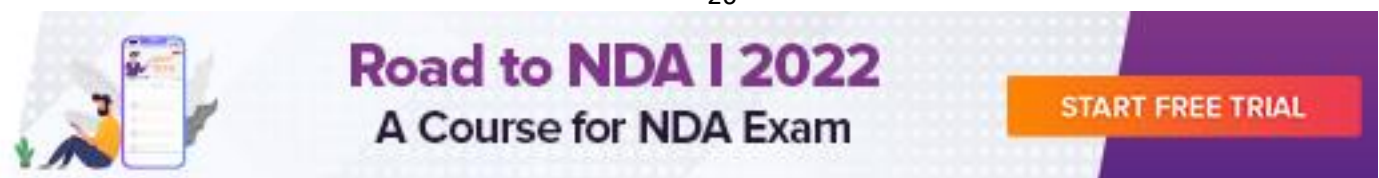
97. Ans. A.

The exosphere is the outermost sphere covering the earth's atmosphere. The inner boundary of the exosphere is somewhere at 400 kilometers while the outer boundary of the exosphere is not defined, it ends in space in a vacuum. Since it is the outermost layer of earth, so, hydrogen and helium being the lightest elements escapes from earth's gravity and reach this layer. Oxygen and neon being heavy do not reach that height, hence option A is correct.

98. Ans. A.

The friction force is generated when two bodies rub each other, it opposes the motion, hence it is always a contact force.

Magnetic force is always a non-contact force as it opposes or attracts other charged particles, bodies, or other magnets.



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99. Ans. C.

LED stands for LIGHT EMITTING DIODE, diodes are made up of semiconductors; semiconductors are the materials having to conduct range between conductors and insulators or non-conductors. A light-emitting diode is a special type of p-n junction diode that emits light when current flows through it.

100. Ans. A.

Density is given by mass per unit volume. Mass of a body is always constant but volume changes as per physical conditions. Hence density varies with the change in physical conditions such as pressure, temperature, etc.

The density of water at atmospheric pressure is maximum at 4 degrees Celsius that is 1gram per milliliter.

1 gm/ml can also be written as 1gm/cm^3

Since $1\text{ ml}=1\text{cm}^3$

Now, $1\text{m}^3=10^6\text{cm}^3$ or $1\text{cm}^3=10^{-6}\text{m}^3$

$1\text{kg}=1000\text{gm}$ or $1\text{gm}=10^{-3}\text{kg}$

Therefore, $\frac{1\text{gm}}{\text{cm}^3} = \frac{10^{-3}\text{kg}}{10^{-6}\text{m}^3} = 10^3\text{kg} / \text{m}^3 = 1000\text{kg} / \text{m}^3$

Hence option A is correct.

101. Ans. D.

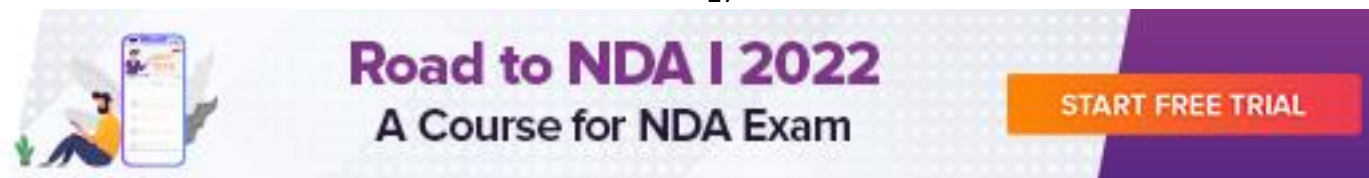
A light-year is a unit of distance. It is defined by the amount of distance traveled by light in one year.

As we know, $speed = \frac{\text{dis tan ce}}{\text{time}}$

Therefore, $\text{dis tan ce} = \text{speed} \times \text{time}$

Speed of light is $3 \times 10^8 \text{ m / sec}$

Time is one year or $365 \times 24 \times 60 \times 60 \text{ seconds}$



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Therefore, 1 light-year = $3 \times 10^8 \times 365 \times 24 \times 60 \times 60 \text{ metre} = 9.46 \times 10^{15} \text{ metre} = 9.46 \times 10^{12} \text{ kilometres}$

Hence only statement 1 is correct, so, option D is correct.

102. Ans. A.

The word ziyarat comes from the Arabic word ziyarat, which means "to come." In Islam, it denotes a religious visit, such as a pilgrimage to a holy site, tomb, or shrine. The term ziyarat is used by Iranian and South Asian Muslims to refer to both the Hajj pilgrimage to Mecca and other pilgrimages such as visiting a holy site. In Indonesia, visiting holy places or graves is referred to as ziyarat.

Ziyarat may also refer to a type of supplication made by the Shia, in which they send salutations and greetings to Muhammad and his family.

103. Ans. C.

In May and June 1875, peasants of Maharashtra in some parts of Pune and Ahmednagar districts revolted against increasing agrarian distress. The Deccan Riots of 1875 targeted conditions of debt peonage (*kamiuti*) to moneylenders. The rioters' specific purpose was to obtain and destroy the bonds, decrees, and other documents in the possession of the moneylenders.

A commission was established by the Bombay government to investigate the 1870s riots in Deccan.

The Commission kept enquirers in the districts where the riots broke out, took statements from ryots, sahlukars, and eyewitnesses, collected data on revenue rates and interest rates in various areas, and collated reports submitted by district collectors. In 1878, the Commission's report was presented to the British Parliament.

The official thought of the colonial government was expressed in this paper. Peasants were enraged by moneylenders, not by the company's sales demand, according to one conclusion. It demonstrates the colonial government's reluctance to acknowledge public opposition to the government's actions. Official records are a priceless resource for reconstructing history, but they must be balanced against other proof.

104. Ans. D.

Naneghat temple is related to the Satavahana dynasty -(Queen Naganika) while Chola temples dedicated to Lord Shiva is present at Chidambaram, Thanjavur and Gangaikondcholpuram.

The Great Living Chola Temples are located in Tamil Nadu, India's southernmost state, and were built during the Chola dynasty's reign. The Cholas were great patrons of the arts, and during their rule, some of South India's most magnificent temples and exquisite bronze icons were built. The Brihadisvara temples of Thanjavur, the Temple of Gangaikondacholisvaram, and the Airavatesvara temple at Darasuram are three great Chola temples from the 11th and 12th centuries.

Chola Period Temples: List of Chola Period Temples

Temple	Location	King
Vijayala-Cholesvara	NartaMalai	Vijayala
Balapuramanyasa	Kannanur	Aditya I
Naveswara	Kumbakunam	Aditya I
Koran Ganatha	Srinivas Nallur	Parantaka I
Tiruvallisvaram	Brahmadesam	Rajaraja I
Uttarakailash	Tiruvadi	Rajaraja I
Vaidyanath	Tirumalavadi	Rajaraja I
Rajarajeshwar	Tanjore	Rajaraja I
Gangaikondachola-puram	Gangaikondachola-puram	Rajendra I
Airavateswara	Darasuram	Rajaraja I
Kampahareswara	Tribhuvanam	Kulotunga III

105. Ans. C.

Saguna Bhakti encompassed practices centred on the worship of particular deities such as Shiva, Vishnu, and his avatars, as well as goddesses and Devi in various forms, all of which were frequently anthropomorphized. Saguna Bhakti was accompanied by Surdas, Tulsidas, and Raskhan.

On the other hand, Nirguna Bhakti was the worship of an abstract kind of deity. This Nirguna Bhakti was followed by Kabir and Nanak.

Saguna is a Sanskrit word that means "with qualities." Nirguna is Sanskrit for "without attributes." The term "Saguna Brahman" refers to a God who has (tangible) qualities. A God with no (tangible) qualities is referred to as a "Nirguna Brahman."

106. Ans. A.

In Buddhism, dharma means "cosmic law and order". The dhamma of Ashoka however is not for spiritual goals but for humanity's progress.

It did not include the worship of a god or the performance of a sacrifice. He believed that, like a father attempting to educate his children, he had a responsibility to educate his subjects.

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Knowing more about other people's religions, Ashoka claimed, would lead to an increase in religious virtues among the people. Dhamma was not the same as Buddhism, which was Ashoka's religion. The Ashoka Dhamma was for the common people, for humanity. He worked tirelessly to spread the Dhamma.

The core concepts of Ashoka's dhamma are as follows:

- People should be able to live in peace and harmony with one another.
- Ahimsa, or non-violence and non-injury to all living things, should be practiced by everyone.
- People should love one another and treat all religious faiths with reverence and tolerance.
- Elders should respect and follow their children, and children should be treated with respect by their elders.
- Respect for Brahmins
- The welfare of his subjects
- Even towards servants and slaves, people should be honest, generous, and kind.

107. Ans. B.

Nageshwar and Balakot were the two major centres for the manufacture of shell artefacts during the Harappan Civilisation. These specialized centres produced shell artefacts such as bangles, ladles, and inlay. Both settlements are close to the sea.

- Balakot is one of four known ancient coastal sites in Pakistan that date back to the Harappan (or Indus) civilization, which flourished in the centuries just before and after 2000 B.C. Since its discovery in the 1920s, this little-known culture has piqued the interest of scholars and students.
- Its geographical range, which stretches from the Arabian Sea to the Himalayan foothills, much outnumbers that of the Near East's coeval Sumero-Babylonian or Egyptian cultures. In the ancient Old World, its evident proclivity for organization and standardization in architecture, objects, and the art style is unrivalled.

108. Ans. A.

The Bolshevik Revolution in Russia took place on November 7, 1917, when Bolshevik forces led by Vladimir Ilyich Lenin overthrew Alexander Kerensky's provisional government.

The provisional government took power after the Russian monarchy was deposed in March 1917 as a result of the February Revolution.

The provisional government was weak and unpopular, drawing criticism from both the right and left.

The monarchy had exiled Lenin, a Marxist revolutionary, and member of the Bolshevik Party, but he returned to Russia in April to inspire workers and soldiers to revolt against the regime.

109. Ans. C.

The Second Continental Congress was a gathering of delegates from America's Thirteen Colonies who banded together to fight the American Revolutionary War. By the time the Congress adopted the Lee Resolution, declaring independence from Britain on July 2, 1776, all thirteen colonies were represented, and the Congress agreed to the Declaration of Independence two days later.

The Declaration of Independence is a document in American history that was ratified by the Continental Congress on July 4, 1776, and declared the secession of 13 British colonies in North America from Great Britain. It explained why the Congress had agreed on July 2 that "these United Colonies are, and of right ought to be Free and Independent States" by the votes of 12 colonies (with New York abstaining).

As a result, although the 4th of July, the day on which the Declaration of Independence was adopted, has always been observed in the United States as the great national holiday—the Fourth of July, or Independence Day—the day on which final secession was officially voted was July 2.

110. Ans. C.

Membership of the United Nations Security Council is held by five permanent members and ten elected, non-permanent members.

Before 1966, there were six elected members, while the permanent members have in essence not changed since the creation of the United Nations in 1945, apart from the representation of China.

Elected members hold their place on the Council for a two-year term, and half of these places are contested each year.



To ensure geographical continuity, a certain number of members is allocated for each of the five UN regional groupings.

The UNSC has 15 members, five of which are permanent members with veto power: the United States, the United Kingdom, Russia, China, and France.

The ten non-permanent or elected members have a two-year term. Estonia, India, Ireland, Kenya, Mexico, Niger, Norway, Saint Vincent, and the Grenadines, Tunisia, and Vietnam are the non-permanent representatives at the moment.

111. Ans. A.

In the Indian Constitution's Preamble, Fundamental Rights, Fundamental Duties, and Directive Principles, the principle of gender equality is enshrined. The Constitution not only guarantees women's freedom but also empowers the government to take constructive discrimination action in their favour.

The Indian Constitution not only guarantees women's equality, but also empowers the government to implement policies of positive discrimination in their favour to mitigate the accumulated socioeconomic, educational, and political disadvantages they face.

Fundamental rights include, among other things, ensuring equality before the law and equal protection under the law; prohibiting discrimination against any person based on religion, ethnicity, caste, sex, or place of birth; and ensuring equal work opportunities for all people. The Constitution's Articles 14, 15, 16, 39(A), 39(B), 39(C), and 42 are particularly important in this regard.

112. Ans. B.

At its Lahore session on December 19, 1929, the Indian National Congress passed the historic 'PurnaSwraj' – (total independence) resolution. On January 26, 1930, a public declaration was made, which the Congress Party urged Indians to commemorate as 'Independence Day.' Owing to a breakdown in talks between leaders of the freedom movement and the British over India's dominion status, the declaration was passed.

The Irwin Declaration sparked a backlash in England, with politicians and the general public opposing India's claim to dominion. Under duress, Lord Irwin told Indian leaders Jinnah, Nehru, Gandhi, and Sapru that he couldn't guarantee dominion status anytime soon. The Indian National Congress became irritated and changed its stance: it abandoned its demands for dominion status and instead passed the 'PurnaSwraj' resolution, which called for full independence, at its Lahore Session in 1929. The resolution signalled the start of a large-scale anti-colonial political movement.

113. Ans. C.

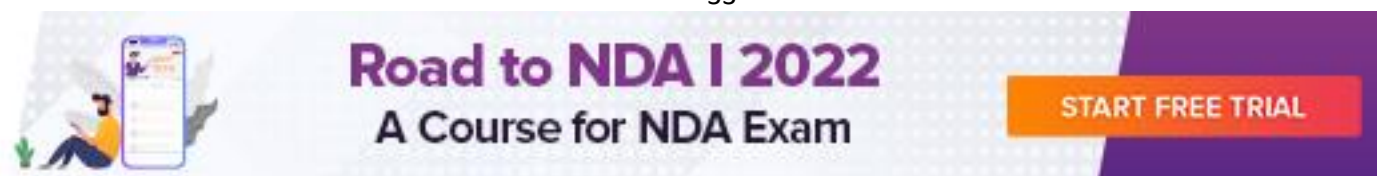
- At the age of 46, Gandhiji returned to India in January 1915.
- South Africa was "the making of the Mahatma," according to historian ChandranDevanesan.
- Gopal Krishna Gokhale was Gandhiji's recognized political mentor.
- Gandhiji spent a year travelling around British India on Gokhale's advice, getting to know the land and its citizens.
- He founded the Sabarmati Ashram in Ahmedabad in 1916, where his friends and followers could learn and practice truth and nonviolence.
- In February 1916, he made his first major public appearance at the opening of the Banaras Hindu University (BHU).
- When it was his turn to speak, Gandhiji accused the Indian elite of being unconcerned about the working people. He described the BHU's opening as "certainly a most gorgeous display." However, he was concerned about the disparity between the two "There were "millions of the poor Indians who were absent" and "richly bedecked noblemen" present.
- It was a declaration of intent - Gandhiji's first public declaration of his intention to make Indian nationalism more inclusive of the entire Indian people.

114. Ans. A.

All these are refineries' names. Some of the refineries of India are given below:

Refinery	State
Manali Refinery	Tamil Nadu
Visakhapatnam Refinery	Andhra Pradesh
Mathura Refinery	Uttar Pradesh
Haldia Refinery	West Bengal
Bina Refinery	Madhya Pradesh
Barauni Refinery	Bihar
Numaligarh Refinery	Assam
Bongaigaon Refinery	Assam
Guwahati Refinery	Assam
Nagapattanam Refinery	Tamil Nadu
Digboi Refinery	Assam
Tatipaka Refinery	Andhra Pradesh
Barmer Refinery[Note]	Rajasthan

115. Ans. A.



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Batholiths are vast bodies of magmatic material that cool in the deeper layers of the Earth's crust and grow into large domes.

Bath- is derived from the Greek word for "deep," and -lith is derived from the Greek word for "rock." The Paleolithic era, for example, is another term for the Stone Age.

A batholith is a type of igneous rock that forms when magma rises into the earth's crust but does not erupt into the surface, despite sounding like something out of Harry Potter. The magma cools under the surface of the earth, creating a rock formation that spans at least 100 square kilometres (40 square miles) and stretches to an uncertain depth.

116. Ans. D.

The maximum depth of the Lithosphere is found in the Himalayan Mountains as Maximum Depth would occur in where there would more of continental crust.

The Indian lithosphere is only 90 kilometres thick underneath the Shillong plateau, but it deepens to 135 kilometres on either side, indicating a lithospheric upwarp related to the plateau uplift. The lithosphere thickens as it travels north, reaching a depth of 180 km beneath the Eastern Himalaya.

The extent of the collision and subduction between the Indian and Asian tectonic plates is determined by lithospheric thickness.

117. Ans. B.

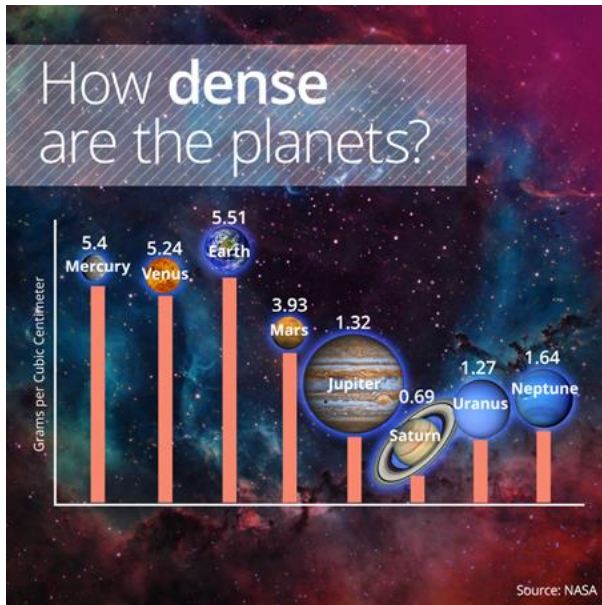
- Seismic focus refers to the location where an earthquake originates.
- On the earth's surface, it's just above the epicentre.
- The epicentre of an earthquake is also known as the hypocenter, and it is at this point that ground ruptures.
- When the ground gives way, the vibrating waves spread outwards in all directions, away from the epicentre of the earthquake.
- Epicentre refers to the location where seismic waves strike the surface of the Earth first.

118. Ans. D.

At 5.514 g/cm³, Earth has the highest density of any planet in the Solar System. Also, the Earth's size, mass, and density combine to produce a surface gravity of 9.8 m/s².

When calculating the surface gravity of other planets, this is often used as a reference point (one g).

Earth's interior, like the interiors of other terrestrial planets, is divided into layers that are differentiated by their chemical or physical (rheological) properties. A heart made of iron and nickel, an upper and lower mantle made of viscous silicate materials, and a crust made of solid silicate materials make up these layers.



119. Ans. A.

- Drumlins, a depositional landform created by glaciers, are referred to as the "basket of eggs" topography.
- They are rounded hummocks that resemble an inverted boat or a spoon and are formed by glacial till deposition.
- They range in height from a few meters to 60-100 meters and in length from a few hundred meters to two kilometres.
- They resemble a basket of eggs when found in a group.
- Drumlin colonies can be found in Finland, Northern Island, and Wisconsin in the United States.
- A drumlin's up-glacier side is steep, while its down-glacier side is gentle. They shape in a line parallel to the ice's movement.

The advertisement features a purple and white background. On the left, there is an illustration of a person sitting on the floor reading a book, with a smartphone displaying a document next to them. The main text in the center reads "Road to NDA I 2022" in large purple letters, followed by "A Course for NDA Exam" in smaller black letters. On the right side, there is a purple rectangular button with the text "START FREE TRIAL" in white capital letters.

120. Ans. C.

The Muhammadan Anglo-Oriental College, the forerunner of Aligarh Muslim University, was founded in 1875 by statesman Sir Syed Ahmad Khan, who had already established two colleges. These were part of the Syed Ahmad Khan-led Muslim awakening movement that became known as the Aligarh Movement.

Sir Syed Ahmad Khan was a strong proponent of religious tolerance. He felt that there was an inherent harmony in all religions that could be referred to as functional morality. He strongly opposed any sign of religious bigotry in personal relationships, believing that a person's faith is a private matter. He was also against communal strife.

Furthermore, Hindus, Parsis, and Christians had generously donated to his college's funds, which were open to all Indians. In 1898, for example, the college had 64 Hindu and 285 Muslim students. Two of the seven Indian teachers were Hindu, one of whom was a Sanskrit scholar.

121. Ans. A.

Swami Dayanand Saraswati created the Arya Samaj, which influenced Indians' religious perceptions. He was opposed to idolatry and man-made rules prohibiting women from reading the Vedas. He also changed the educational system by establishing Anglo-Vedic schools to provide Indian students with a revised curriculum that included both Vedic knowledge and modern English education.

Dayanand regarded the Vedas as eternal and infallible, and in his book Satyarth Prakas, he outlined his interpretations of them. He regarded the Vedas as God's inspired word and the source of all wisdom. Based on its incompatibility with the Vedas, he opposed all later religious thinking.

After Kashi Shashtrarth on 16th November 1869, Swami Dayanand reached Prayag via Mirzapur. In Prayag, Swamiji met Pandit Devendra Nath Thakur who invited Swamiji to Calcutta.

On this invitation, Swamiji came to Calcutta on 16th December 1872 and stayed there till 31st March 1873. Here Swamiji met the then learned group of Bengal viz., Pdt. Ishwar Chand Vidyasagar, Pdt Keshav Chandra Sen, Barrister Chandra Sekhar Sen and Barrister Umesh Chandra Bandopadhyaya along with Pdt. Devendra Nath Thakur.

122. Ans. D.

- The text Ain-i-Akbari dates from the 16th century.
- Written in Persian by Abu'Ifazl, Akbar's court historian.

- The administration of Mughal Emperor Akbar is the subject of this book.
- Henry Beveridge translated the Akbar Nama into English in the early twentieth century.
- Background: Abu'lFazl worked on the 'Akbar Nama' for thirteen years, starting in 1589. There are three books in the Akbar Nama:
 - o The first book focused on Akbar's forefathers.
 - o The events of Akbar's reign were chronicled in the second.
 - o The Ain-i Akbari is the third part. It covers Akbar's government, household, army, revenues, and empire's geography. It contains a wealth of information about the Indian people's customs and culture. Statistics on crops, yields, prices, salaries, and revenues were also obtained.

123. Ans. B.

Dasara Dibba or the Mahanavami Dibba is a beautiful stone platform located within the Royal Enclosure of Hampi. It was built during the Vijayanagara period by King Krishnadevaraya to commemorate his victory over Udaygiri.

It was here where the King of Vijayanagar used to celebrate the festival of Dasara (Dussehra). The name "Mahanavami Dibba" is derived from the platform's shape and the Mahanavami platform that can be seen there. Dussehra, Durga Puja, and Navratri or Mahanavami are all connected with the structure.

The king received gifts and homage from the Nayakas. The "Audience Hall" and the "Mahanavami Dibba" were the two most impressive platforms. High double walls encircled the entire complex, with a street running between them. The audience hall consisted of a high platform with wooden pillar slots spaced at near and frequent intervals. There was a stairwell leading to the second level. The pillars were very close together.

124. Ans. B.

Mirabai's preceptor, according to some tradition, was Raidas, a leatherworker. This would suggest her rejection of caste society's norms.

Mirabai has been recognized as a source of inspiration for decades, even though she did not attract a sect or community of followers.

Meera reunited with Raidas, her Guru and mentor, who is said to have lived to the ripe old age of 118. She frequented the slums to attend this great teacher's Satsang. This

was the catalyst and motivation for the numerous questions and controversies she posed in her songs about Kulam.

125. Ans. A.

If a location's time is 5 hours behind Indian Standard Time (IST), which is 0.5 hours ahead of Greenwich Mean Time (GMT), it is East of the Prime Meridian, i.e. 0 degrees. A 15-degree difference in longitude equals one hour of difference. This indicates that the given position is 7.5 (15 divided by 2) degrees East of the Prime Meridian, or 7 degrees and 30 minutes East of the Prime Meridian.

126. Ans. C.

The Equator, which divides the globe into two equal parts, the northern and southern hemispheres, has the longest latitude, 0°latitude.

Since all other latitudes become smaller as they travel north and south from the equator, towards the poles, the equator is also known as the largest circle.

All of the other circles are smaller. The north and south poles are linked by longitudes or meridians, which are equivalent lines of similar length. The longest longitude line, for example, does not exist.

127. Ans. C.

- Claire Polosak of Australia made history as the first female match official to officiate a men's Test match when she was appointed the fourth umpire in the third Test between Australia and India, which began on Thursday at the Sydney Cricket Ground.
- Polosak will be part of the playing control committee for the third Test of the ongoing Border-Gavaskar Trophy, alongside fellow Australian match officials Paul Reiffel, Paul Wilson, Bruce Oxenford, and David Boon.
- The 32-year-old also has the distinction of becoming the first woman on-field umpire in a men's ODI match in ICC's Division 2 league between Namibia and Oman played at the Windhoek in 2019.
- Polosak's international umpiring career began in Thailand in 2015, when she was assigned to the ICC Women's T20 Qualifying tournament. As a result, she was selected for the Women's T20 World Cup in India.

128. Ans. A.

Due to fears about the COVID-19 pandemic, Madagascar has been chosen to host the 2023 Indian Ocean Island Games instead of the Maldives. Last year, the Maldives was awarded the case, but the Indian Ocean Island Games Federation voted to move the Games to Madagascar.

The decision was made due to the difficulties the Maldives is having organized the event during the coronavirus outbreak. The Maldives demanded that the 2023 Games be pushed back to 2025, but the IOIGF wanted to prevent a six-year gap between editions of the multi-sport event.

129. Ans. C.

Tamil Nadu is the winner of the Syed Mushtaq Ali Trophy, 2021.

The Invincibles' Tamil Nadu defeated third-time finalists Baroda by seven wickets to win the Syed Mushtaq Ali Trophy (SMAT) for the second time at Sardar Patel Stadium in Ahmedabad. In 2006/07, Tamil Nadu won their first Syed Mushtaq Ali title. Both titles were won under the captaincy of Dinesh Karthik, 14 years apart.

In what turned out to be one of the most one-sided finals in SMAT history, the title favourites required just 18 overs to chase down the paltry mark of 121. Tamil Nadu looked like a well-oiled machine as they proved yet again why they are the most dominant side in the Syed Mushtaq Ali Trophy 2021, led by opener Hari Nishanth's 35 and a fantastic M Siddharth.

130. Ans. D.

After arresting civilian leader Aung San Suu Kyi and other senior officials, Myanmar's military declared a one-year state of emergency recently and named a general as acting president.

The step, according to an announcement on military-owned Myawaddy TV, was essential to maintain the state's "stability," accusing the country's election commission of failing to fix "massive irregularities" in the November election.

The announcement comes as the country's new Parliament session was set to begin, following days of concern about the possibility of a military coup.

The nation's top official, State Counsellor Aung San Suu Kyi, and the country's president, Win Myint, were both detained in the pre-dawn hours of Monday, according to The Irrawaddy, an existing online news service. Myo Nyunt, a spokesperson for Suu Kyi's ruling National League for Democracy, was quoted by the news service.

131. Ans. D.

About Exercise Kavach:

- Participation: Indian Army, Indian Air Force, and Indian Navy.
- The Indian Coast Guard will also be included in the large scale Joint Military exercise
- The exercise includes the organized use of maritime surveillance assets, air and maritime strikes, air defence, submarine, and landing operations.
- The joint force would execute multi-domain, high-intensity offensive and defensive manoeuvres in the Andaman Sea and Bay of Bengal.
- The tri-services exercise aims to fine-tune joint war-fighting capabilities and Standard Operating Procedures (SOPs) towards enhancing operational synergy.
- Importance: The exercise will assess all agencies' preparedness to cope with an asymmetric challenge. Asymmetrical threats are a force's unorthodox techniques and tactics.

132. Ans. D.

The President of the United States of America conferred the highest award, The Legion of Merit, Degree Chief Commander, to Prime Minister Narendra Modi on 21 December 2020. The award honours the Prime Minister's unwavering leadership and vision for India's rise as a global power, as well as his outstanding contributions to the development of the India-US strategic partnership and the promotion of global peace and prosperity.

Taranjit Singh Sandhu, India's Ambassador to the United States, accepted the award on behalf of the Prime Minister. The Legion of Merit, Degree Chief Commander, was also presented to Australia's Prime Minister Scott Morrison and Japan's former Prime Minister Shinzo Abe at the ceremony.

The Legion of Merit, awarded in the highest degree of the Chief Commander, is a prestigious decoration bestowed by the President of the United States on foreign heads of state or government.

133. Ans. A.

In the Central African Republic, President Faustin Archange Touadera was recently sworn in for a second term, even though he is facing a growing threat from an armed rebellion linked to the country's former strongman Francois Bozize. During his second term, Touadera, who won the December election with around 53% of the vote, promised "zero impunity for the perpetrators of crimes."

134. Ans. B.

The best tableau in this year's (2021) Republic Day parade was awarded to Uttar Pradesh. Tripura's tableau was deemed the second greatest.

The parade on Rajpath this year featured 32 tableaux, including 17 from state and union territories, nine from Union ministries, departments, and paramilitary forces, and six from the Defence ministry.

'Ayodhya: Cultural Heritage of Uttar Pradesh' was the theme of Uttar Pradesh's tableau. The tableau portrayed the cultural heritage of Ayodhya, a reproduction of the Ram temple, a glimpse of 'Deepotsav,' and various stories from the Ramayana epic.

135. Ans. B.

- The Indian Air Force (IAF) and French Air and Space Force participated in Exercise Desert Knight-21.
- The bilateral air exercise took place from January 20 to 24 at the Jodhpur Air Force Station in Rajasthan, India.
- Exercise Desert Knight-21 aims to enhance interoperability between the forces while sharing ideas and best practices learned from operational experience.
- The military drill included Rafale, Airbus A-330 multi-role tanker transport (MRTT), and A-400M tactical transport aircraft, as well as about 175 personnel from the French Air and Space Force.
- IAF assets involved in the exercise will also include Mirage 2000, Su-30 MKI, IL-78 flight refuelling aircraft, AWACS, and AEW&C aircraft.
- The joint drill marks a major landmark 'in the sequence of engagements between the two countries.
- The IAF and the French Air and Space Force have performed six editions of the 'Garuda' air exercises as part of the Indo-French defence cooperation. The most recent of these was held at Mont-de-Marsan AFB in France last year.

136. Ans. B.

As per the data up to November 2020, published by the Union Finance Ministry, Singapore ranks 1 in terms of Outward Direct Investment (ODI) for the year 2020 – 21.

A corporate strategy in which a domestic company extends its activities to a foreign country is known as an outward direct investment (ODI).

ODI can take several different forms depending on the organization. Some businesses will, for example, make a greenfield investment, which is when a parent company establishes a subsidiary in another country. A foreign country merger or acquisition is also possible (and thus considered an outward direct investment). Finally, as part of an ODI strategy, a company can decide to expand an existing international facility. If domestic markets become saturated and better business prospects are available abroad, using ODI is a natural progression for businesses.

137. Ans. A.

Fundamental Duties are covered in Part IVA of the Indian Constitution. There are currently 11 fundamental duties which include civic as well as moral duties.

Originally, these responsibilities were not included in the Indian Constitution. The 42nd and 86th Constitutional Amendment Acts incorporated fundamental duties.

The Constitution imposes a legal obligation on citizens to carry out these responsibilities. These, like the Directive Principles, are non-justifiable and come with no legal consequences if they are violated or ignored.

138. Ans. B.

In the first instance, the Speaker does not vote. In the event of a tie, he will cast the deciding vote. In other terms, the Speaker is only allowed to vote when the House is evenly split on any issue. This type of vote is known as a casting vote, and it is used to break a tie.

The following are the Speaker's powers and functions:

Control over the House's proceedings:

- In the absence of a quorum, he adjourns or suspends the conference.
- He is the Speaker of the House of Commons, and he presides over the joint sitting of the two houses of Parliament.
- On the Leader of the House's order, he will make a secret House sitting.

Disciplinary Purposes:

- He keeps the house in order and preserves decorum to conduct business and regulate proceedings.

Administrative responsibilities:

- The Lok Sabha Secretariat is under his direction. He appoints Secretariat staff, establishes service rules for them, and oversees their function.
- He is in charge of keeping the records of the House's proceedings up to date.

139. Ans. C.

The terms secular and socialist were inserted into the Indian Constitution during the Emergency by Indira Gandhi's government, which had dubious legitimacy and was eager to demonstrate that it was true to the spirit of the Constitution, even though its actions were violating the same Constitution's provisions for civil liberties.

The Preamble's goals are to ensure justice, liberty, and equality for all people, as well as to foster fraternity to uphold the nation's unity and dignity. The date it was adopted, November 26, 1949, is stated in the preamble.

Our Constitution's Preamble is a part of the document, but it is not enforceable by the courts. The Preamble is illegitimate. This means that courts cannot issue orders compelling the Indian government to enforce the Preamble's ideas.

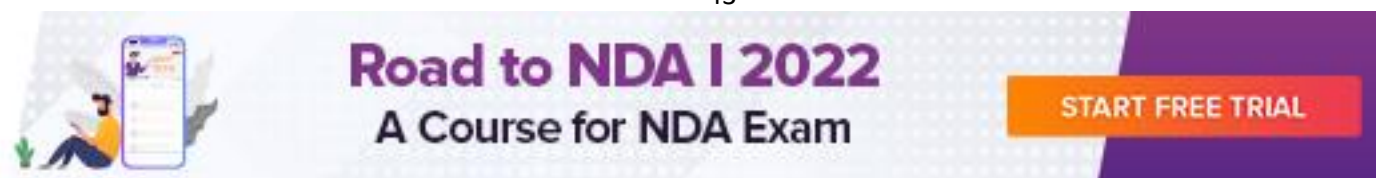
A 'Republic' is a state in which the people and their elected officials have ultimate power. Rather than a king, it has an elected head of state. People give power to leaders they elect to represent and serve their interests in a 'Republic.' Although India gained independence from the British on August 15, 1947, it did not declare itself a sovereign, democratic, or republic state until January 26, 1950, when the Constitution of India was adopted.

140. Ans. B.

The Beas River is a river in India's northwestern region. The river begins in the Himalayas in central India's Himachal Pradesh and flows for 470 kilometres (290 miles) to the Sutlej River in Punjab.

The river rises 4,361 meters (14,308 ft) above sea level on the southern face of Rohtang Pass in Kullu. At Sandhol, 590 meters (1,940 feet) above sea level, it passes through the Mandi District and enters the Kangra District.

After a 470-kilometre journey, the Beas finally meets the river Sutlej at the southwestern border of Punjab's Kapurthala district (290 mi). Bain, Banganga, Luni, and Uhal



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are the major tributaries. The Sutlej enters Pakistani Punjab and merges with the Chenab River near Bahawalpur to form the Panjnad River, which then joins the Indus River at Mithankot.

141. Ans. A.

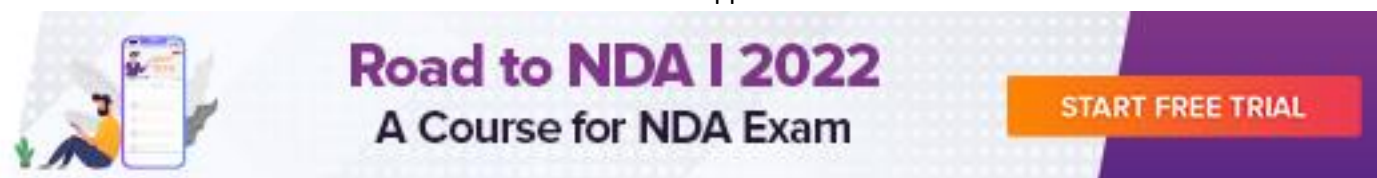
- Tropical Deciduous Forests, also known as Monsoon Forests, are the most common forests in India.
- Tropical deciduous forests can be found in areas of rainfall ranging from 70 to 200 cm.
- Moist deciduous forests and dry deciduous forests are two types of tropical deciduous forests.
- The moist deciduous forests can be found in areas with rainfall ranging from 100 to 200 cm.
- The wet deciduous forests can be found in the Himalayan foothills, the Western Ghats' eastern slopes, and Odisha.
- The key species of moist deciduous forests include teak, sal, shisham, mahua, amla, hurra, semul, kusum, and sandalwood, among others.
- Dry deciduous forests can be found in areas where rainfall is between 70 and 100 cm.
- When the dry season approaches, deciduous forest trees lose all of their leaves.
- Tendu, palas, amaltas, bel, khair, axlewood, and other dry deciduous forest trees include tendu, palas, amaltas, bel, khair, axlewood, and others.

142. Ans. B.

The Indian government has launched the "Bharatmala Pariyojana," a new highway umbrella program aimed at improving the quality of road traffic movement across the country by bridging vital infrastructure gaps. The project covering a whopping 34800 km of the road will be completed in a staggered manner.

Highlights of the Bharatmala Pariyojana include:

- Improvement in the efficiency of existing corridors through the construction of Multimodal Logistics Parks and elimination of chokepoint
- Improve connectivity in the North-East by leveraging synergies with inland waterways.



- For Project Preparation and Asset Monitoring, there is a strong emphasis on the use of technology and scientific planning.
- Delegation of authority to speed up project delivery - Phase I is expected to be completed by 2022.
- In the North East, improving connectivity is a priority.

143. Ans. C.

The South Eastern Railway (abbreviated SER) is part of the Eastern Railways and is one of India's 18 railway zones. Garden Reach, Kolkata, West Bengal, India is the headquarters of SER. Adra railway division, Chakradharpur railway division, Kharagpur railway division, and Ranchi railway division make up this railway division.

144. Ans. C.

Intensive subsistence agriculture can be divided into two categories. Wet paddy dominates one, while crops like sorghum, soybeans, sugarcane, maize, and vegetables dominate the other. Tonking Delta (Vietnam), Japan, lower Menem (Thailand), lower Irrawaddy (Myanmar), Indonesia, and the Ganga-Brahmaputra Delta, Eastern Coastal Plains are all examples of intensive subsistence farming (India).

The farmer cultivates a small plot of land using simple tools and more labour is intensive subsistence agriculture. Subsistence agriculture is a form of farming in which the farmer and his family eat the crops grown. It comes in a variety of forms. It may be changing or settled agriculture, primitive or non-primitive, and both intense and broad in scope.

In Canada, Extensive Commercial farming is practised, which is meant for exports.

145. Ans. C.

Nimbus is a Latin word that means "rainstorm." Rain or nimbus clouds tend to look dark grey because their depth and/or density of large water droplets obscures sunlight.

Nimbus clouds can produce hail or snow instead of liquid rain, depending on the weather.

While rain may fall from other cloud types, the prefix "nimbo-" or the suffix "-nimbus" designates two prominent types of rain clouds: "nimbostratus" and "cumulonimbus."

146. Ans. D.

Condensation occurs:

- When the air temperature is reduced to dew point while the volume of the air remains constant (adiabatically),
- When the volume, as well as the temperature, are also decreased,
- When moisture is introduced to the air through evaporation,
- Dew, ice, fog, frost and clouds are all sources of water vapor or moisture in the atmosphere that form after condensation.
- Condensation occurs when the dew point is both lower and higher than the freezing point.

Ice Pellets (Sleet): Precipitation of transparent or translucent pellets of ice, which are round or irregular hard grains of ice consisting of frozen raindrops, or largely melted then refrozen snowflakes.

147. Ans. D.

Iceland is a fascinating island, particularly for human habitation, and it attracts a large number of tourists. Despite being so far north (just beyond the Arctic Circle), the Gulf Stream (a constant current of warm air and water that also gives England its mild temperatures) keeps the climate moderate, allowing people to remain there for over two thousand years.

The island is also geologically active, which the island's inhabitants have taken advantage of since they arrived. Because of this geological activity, hot springs are common in Iceland, which is formed by groundwater flowing near magma (underground lava).

Icelanders have also discovered ways to harness geological activity for energy generation. One-third of the country's energy is "geothermal," which means they use the Earth's underground heat to directly heat homes and buildings or generate electricity using steam. Finally, the lava flows, geysers, hot springs, and volcanic scenery of Iceland contribute to the country's economy by attracting visitors to come to see the island's wonders.

148. Ans. D.

Minor tectonic plates:

- Cocos plate - Between Central America & Pacific plate
- Nazca plate - Between South America & Pacific plate

- Arabian plate - Mostly the Saudi Arabian landmass
- Philippine plate - Between the Asiatic & Pacific plate
- Caroline plate - Between the Philippine & Indian plate (North of New Guinea)
- Fuji plate - North-east of Australia
- Turkish plate
- Aegean plate (Mediterranean region)
- Caribbean plate
- Juan de Fuca plate (between Pacific & North American plates)
- Iranian plate.

Other than the plates listed above, there are several more minor plates.

The stress produced by converging major plates caused the majority of these minor plates to shape.

Because of the compressive force exerted by the Eurasian and African plates, the Mediterranean Sea is divided into various minor plates.

Major Tectonic Plates: African plate, Antarctic plate, Eurasian plate, Indo-Australian plate, North American plate, Pacific plate, South American plate.

149. Ans. C.

The Brahmaputra River System's major tributaries include:

North bank tributaries include The Jialhal, The Siang, The Kameng (Jiabharali in Assam), The Subansiri, The Dhansiri(North), The Puthimari, The Pagladiya, The Aie, The Sankosh, The Manas, The Saralbhanga, The Champamati.

South bank tributaries include The Dudhnai, The Krishnai, The Kopili, The Digaru, The Buridehing, The NoaDehing, The Debang, The Dikhow, The Dhansiri(South).

The Mahananda River is a transboundary river that flows through Bihar and West Bengal, and Bangladesh. It is an important tributary of the river Ganga.

150. Ans. A.

Keppel Island is completely bleached mainly due to the expansion of Starfish. The recurrent outbreaks of coral-eating crown-of-thorns starfish (which may also be due to water quality changes) are cited as a major cause. S

According to the Great Barrier Reef Marine Park Authority, bleaching around Keppel Island is serious, affecting nearly all species. Whitsunday Island and Magnetic Island were both severely impacted. Since the beginning of the year, sea temperatures have been at record highs, resulting in bleaching.

"From early January to mid-March, almost the entire reef's temperature was 2 degrees Celsius or higher than average," said Thomas Goreau, president of the Global Coral Reef Alliance in New York. "The bleaching that washed out the Maldives, Seychelles, and western Australian reefs in 1998 was colder and lasted longer."

The high temperatures seem to be linked to the start of a new El Nio, which was also responsible for the 1998 bleaching. Goreau, on the other hand, believes that global warming is the most important underlying cause. "It means the reefs are already stressed until El Nio kicks in," he said.



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