NDA II 2019 GAT (Previous Year Paper):Solution

1. Ans. B.

"Removed" is the most appropriate answer to fill the blank with. Hence, option B is correct.

2. Ans. D.

'Taking' option D is the most appropriate answer to fill the blank with.

3. Ans. C.

Option C 'staging' is the most appropriate answer to fill the blank with.

4. Ans. A.

'Met with' is the most appropriate answer to fill the blank with. Hence, option A is correct.

5. Ans. B.

The most appropriate answer to fill the blank is option B 'Announced'.

6. Ans. C.

As per the author one should read to Evaluate and understand. Hence, option C is the most appropriate answer.

7. Ans. B.

'Cunning' human beings denounce studies, Hence, option B is the correct answer.

8. Ans. D.

According to the author, studies can be perfected by experience, hence, option D is the correct answer.

9. Ans. A.

As per the passage, too much study reflects idleness, hence, option A is the correct answer.

10. Ans. C.

According to the given passage, One should study for pleasure, enhanced capability and holistic growth. Hence, option C is the correct answer.

11. Ans. D.

The correct sequence of the given jumbled parts of the sentence is option D '**QRPS'.**

12. Ans. C.

The correct sequence of the given jumbled parts of the sentence is option C '**QRPS'**.

13. Ans. B.

The correct sequence of the given jumbled parts of the sentence is option B **'QSRP'.**

14. Ans. C.

The correct sequence of the given jumbled parts of the sentence is option C '**QPSR**'.

15. Ans. A.

The correct sequence for the given question is option A '**RQSP'**.

16. Ans. B.

Option B 'To be extremely happy' correctly expresses the meaning of the given idiom.

17. Ans. C.

Option C correctly expresses the meaning of the given idiom.

18. Ans. D.

Option D 'To chose to ignore behavior that you know is wrong.' Correctly expresses the meaning of the given idiom.

19. Ans. A.

Idiom 'Bite your tongue' means **To stop yourself from saying something because it would be better not to.'**

20. Ans. C.

Option C 'To be too old to do things' correctly expresses the meaning of the given idiom.

21. Ans. C.

The error is in the part C of the given sentence, 'was' should be replaced with 'were'.

The correct sentence should be 'He asked whether either of the brothers **was** at home.'

22. Ans. B.

The error is in the part B of the given sentence, '**is'** should be replaced with 'are'.

23. Ans. C.

The error is in the part C of the given sentence, preposition '**to'** should be added before 'this temptation',

The correct sentence should be 'Many a man has succumbed to this temptation.'

24. Ans. B.

The error is in the part B of the given sentence, The correct sentence should be 'Neither praise nor blame seems to affect him.'

25. Ans. C.

The error is in the Part C of the given sentence, The correct sentence should be 'Every one of the boys **loves** to ride.'

26. Ans. D.

There is no error in the given sentence.

27. Ans. A.

The error is in the part A of the given sentence, Article '**The'** should be added before 'home'.

28. Ans. D.

The error is in the part D of the given sentence, the correct sentence should be 'Work hard lest you should fail' or 'Work hard lest you fail.'

29. Ans. C.

The error is in part C of the given sentence, 'Do' should be replaced with '**Did'.**

30. Ans. A.

The error is in the part A of the given sentence, correct preposition 'in' should be used in place of 'at'.

31. Ans. D.

'Unknown' is the correct antonym for the given word.

Renowned- known or talked about by many people; famous.

Distinguishable- clear enough to be recognized or identified as different; discernible.

Eminent- famous and respected within a particular sphere.

32. Ans. C.

'Amenable' is the most appropriate antonym for the given word.

Stubborn – having or showing dogged determination not to change one's attitude or position on something.

Dogged- having or showing tenacity and grim persistence.

Rigid- unable to bend or be forced out of shape; not flexible.

33. Ans. B.

'Apathetic' is the most appropriate antonym for the given word.

Animated- full of life or excitement; lively.

Fervent- having or displaying a passionate intensity.

Vigorous- strong, healthy, and full of energy

34. Ans. D.

The most appropriate antonym for the given word is 'Rare'

Endemic – regularly found among particular people or in a certain area.

Pervasive – spreading widely throughout an area or a group of people.

Common - occurring, found, or done often; prevalent.

35. Ans. C.

Arousing- evoke or awaken (a feeling, emotion, or response).

Invigorating- making one feel strong, healthy, and full of energy.

Stirring- causing excitement or strong emotion; rousing.

36. Ans. B.

Mutual- experienced or done by each of two or more parties towards the other or others.

Shared- distributed between members of a group.

Corresponding- analogous or equivalent in character, form, or function; comparable.

37. Ans. D.

'Thrifty' is the correct antonym for the given word.

Extravagant – lacking restraint in spending money or using resources.

Profligate- recklessly extravagant or wasteful in the use of resources.

Wasteful - (of a person, action, or process) using or expending something of value carelessly, extravagantly, or to no purpose.

38. Ans. A.

Option A 'Vague' is the most appropriate antonym for the given word.

Penetrating- able to make a way through or into something.

Trenchant- vigorous or incisive in expression or style.

Precise- marked by exactness and accuracy of expression or detail.

39. Ans. C.

Agitator- a person who urges others to protest or rebel.

Rebel- a person who rises in opposition or armed resistance against an established government or leader.

Revolutionary- involving or causing a complete or dramatic change.

40. Ans. D.

'Rational' is the most appropriate antonym for the given word.

Farcical- relating to or resembling farce, especially because of absurd or ridiculous aspects.

Foolish- lacking good sense or judgement; unwise.

Preposterous- contrary to reason or common sense; utterly absurd or ridiculous.

41. Ans. C.

'Gather' is the correct synonym for the given word.

Injure- do physical harm or damage to (someone).

Spoil- diminish or destroy the value or quality of.

Main- wound or injure (a person or animal) so that part of the body is permanently damaged.

42. Ans. C.

'Foul' is the most appropriate synonym for the given word.

Nice- giving pleasure or satisfaction; pleasant or attractive.

Fastidious- very attentive to and concerned about accuracy and detail.

Finicky- (of a person) fussy about their needs or requirements.

43. Ans. A.

'Bankrupt' is the correct synonym for the given word.

Rich- having a great deal of money or assets; wealthy.

Making profit- To make profits, benefits.

Having liabilities- a thing for which someone is responsible, especially an amount of money owed.

44. Ans. D.

'Abusive' is the correct synonym for the given word.

Imaginative- having or showing creativity or inventiveness.

Sprightly- (especially of an old person) lively; full of energy.

Vivacious- (especially of a woman) attractively lively and animated.

45. Ans. C.

'Defenceless' is the correct synonym for the given word.

Resilient- (of a person or animal) able to withstand or recover quickly from difficult conditions.

Elastic- (of an object or material) able to resume its normal shape spontaneously after being stretched or compressed.

Crude- in a natural or raw state; not yet processed or refined.

46. Ans. A.

Inert – lacking the ability or strength to move.

Ebullient- cheerful and full of energy.

Caustic- able to burn or corrode organic tissue by chemical action.

47. Ans. B.

Conservative- averse to change or innovation and holding traditional values.

Passionate- having, showing, or caused by strong feelings or beliefs.

Monstrous- having the ugly or frightening appearance of a monster.

48. Ans. D.

The correct synonym for the given word is 'Solitariness'

Meaning of the other words are:

Nature- The phenomena of the physical world collectively, including plants, animals, the landscape, and other features and products of the earth, as opposed to humans or human creations.

Scripture- the sacred writings of Christianity contained in the Bible.

Seafaring- (of a person) regularly travelling by sea.

49. Ans. C.

The correct synonym for the given word is 'Rapturous'

Meaning of the other words are:

Efficacious- (of something inanimate or abstract) successful in producing a desired or intended result; effective.

Eerie- strange and frightening.

Reverential- of the nature of, due to, or characterized by reverence.

50. Ans. A.

The correct synonym for the given word is 'Worried'

Meaning of the other words are:

Dispassionate- not influenced by strong emotion, and so able to be rational and impartial.

Sluggish- slow-moving or inactive.

Torpid- mentally or physically inactive, lethargic.

51. Ans. D.

The Normal or Environmental Lapse rate is rate of change in temperature observed while moving upward through the Earth's atmosphere. This varies from zone to zone and is affected by radiation, convection, and condensation. Averages

Altitude Range(Km)	Lapse Rate(°C/km)
0-11	6.5
11-20	0.0
20-32	-1.0
32-47	-2.8
47-51(Upper stratopause)	**0.0**
51-71	2.8
71-85	2.0

52. Ans. B.

The 17th and the last Mughal Emperor of India, Bahadur Shah Zafar was a great freedom fighter actively involved in the Sepoy mutiny of 1857. He

was made the Commander-in-Chief of the Sepoys. Seeing his rebellious activities, Bahadur Shah Zafar was exiled to Rangoon which is now in Bangladesh. After the revolt was crushed, Zafar was caught from the Humayun's Tomb where he took refuge. Zafar was tried and found guilty. He was exiled to Rangoon, Burma in 1858, where he remained until his death on November 7, 1862.

53. Ans. C.

Maulana Abul Kalam Azad was the first Education Minister of independent India. National Education Day is celebrated on 11th November, the birth anniversary of the great visionary and freedom fighter Maulana Azad whose real name was Abul Kalam Ghulam Muhiyuddin. A renowned scholar and poet, Maulana Azad was well versed in many languages, a brilliant orator and was one of the foremost leaders of the Indian freedom struggle.

54. Ans. B.

Article 46 of the Constitution of India refers to the promotion of educational and economic interests of Scheduled Castes, Scheduled Tribes and other weaker sections.

Article 46 of the Indian Constitution reads as follows- "Promotion of educational and economic interests of Scheduled Castes, Scheduled Tribes and other weaker sections The State shall promote with special care the educational and economic interests of the weaker sections of the people, and, in particular, of the Scheduled Castes and the Scheduled Tribes, and shall protect them from social injustice and all forms of exploitation".

55. Ans. B.

The first Industrial Revolution began in the 1760s, and this period is marked by tremendous technological, socioeconomic, and geopolitical change in the world. The development of the spinning jenny, flying shuttle, steam engine (developed by James Watt) and power loom (developed by Edmund Cartwright) assisted the industrial revolution. Also, Britain happened to have a wealth of coal, iron, and other resources which provide sufficient raw material and energy source for the factories to run. On the other hand, Britain's financial institutions such as a central bank, were there to finance new factories. The rule of law and property rights also promoted investment and risk-taking. Large capital-hungry structures like factories could now be built on credit.

56. Ans. A.

The First exam for the Indian Civil Service (ICS) was held in 1855 in London. Satyendranath Tagore (elder brother of Rabindranath Tagore,) became the first Indian to qualify the ICS in 1863. Satyendranath was allotted Bombay Presidency Cadre and retired after more than 30 years of service.

Satyendranath was born in 1842 at Jorosanko. He studied initially at home and later at Presidency College. During this time, he was involved in the activities of Brahmo Samaj.

57. Ans. C.

The period from 1793 to 1794 is known as the Reign of Terror. Maximilian Robespierre sentenced to death all those persons who he considered as enemies of the republic, whether they were ex-noble, clergy, and members of any political parties; including Jacobins. The executions were completed after trial by the revolutionary tribunal. At that time, Robespierre followed a policy of severe control and punishment. Guillotine, a device, named after inventor Dr. Guillotin, was used to behead a person at that time. It consists of two poles and a blade. Guilty persons were beheaded using a guillotine.

In June 1793, 22 leading Girondinst were forcibly expelled from the National Convention by intimidation, by the force of a huge Sans-culottes (in alliance with Jacobin) insurrection in Paris

58. Ans. C.

The Suez Canal is an artificial sea-level waterway running north to south across the Isthmus of Suez in Egypt to connect the Mediterranean Sea and the Red Sea. The canal separates the African continent from Asia, and it provides the shortest maritime route between Europe and the lands lying around the Indian and western Pacific oceans. It is one of the world's most heavily used shipping lanes.

The canal has no locks because of the flat terrain, and the minor sea level difference between each end is inconsequential for shipping.

59. Ans. A.

The Munda language group is a subgroup of the Austroasiatic family. The Munda peoples are generally believed to represent indigenous tribal populations over much of their current areas of residence in India.

Munda languages are spoken by around ten million people total, primarily in the eastern and central Indian States of Odisha, Jharkhand,

Chhatisgarh, West Bengal, Maharashtra, and Madhya Pradesh, as well as in adjacent regions of Nepal and Bangladesh.

60. Ans. C.

The Ramsar Convention is an international treaty for the conservation and sustainable utilization of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value.

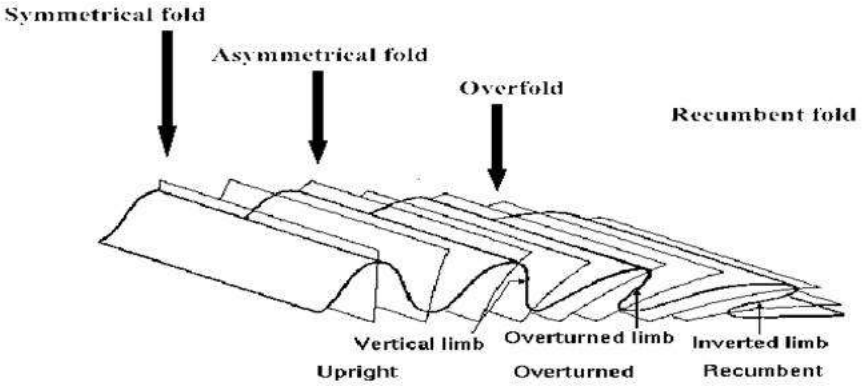
Ramsar Wetlands Sites (As On February, 2019)

Sl. No.	Name of Site	State Location	Date of Declaration	Area (*in Sq. km.*)
1	Asthamudi Wetland	Kerala	19.8.2002	614
2	Bhitarkanika Mangroves	Orissa	19.8.2002	650
3	Bhoj Wetlands	Madhya Pradesh	19.8.2002	32.01
4	Chandertal Wetland	Himachal Pradesh	8.11.2005	0.49
5	Chilka Lake	Orissa	1.10.1981	1165
6	Deepor Beel	Assam	19.8.2002	40
7	East Calcutta Wetlands	West Bengal	19.8.2002	125
8	Harike Lake	Punjab	23.3.1990	41
9	Hokera Wetland	Jammu and Kashmir	8.11.2005	13.75
10	Kanjli Lake	Punjab	22.1.2002	1.83
11	Keoladeo Ghana NP	Rajasthan	1.10.1981	28.73
12	Kolleru Lake	Andhra Pradesh	19.8.2002	901
13	Loktak Lake	Manipur	23.3.1990	266
14	Nalsarovar Bird Sanctuary	Gujarat	24/09/12	120
15	Point Calimere	Tamil Nadu	19.8.2002	385
16	Pong Dam Lake	Himachal Pradesh	19.8.2002	156.62
17	Renuka Wetland	Himachal Pradesh	8.11.2005	0.2
18	Ropar Lake	Punjab	22.1.2002	13.65
19	Rudrasagar Lake	Tripura	8.11.2005	2.4
20	Sambhar Lake	Rajasthan	23.3.1990	240
21	Sasthamkotta Lake	Kerala	19.8.2002	3.73
22	Sunderbans Wetland	West Bengal	30.1.2019	4230
23	Surinsar-Mansar Lakes	Jammu and Kashmir	8.11.2005	3.5
24	Tsomoriri Lake	Jammu and Kashmir	19.8.2002	120
25	Upper Ganga River (Brijghat to Narora Stretch)	Uttar Pradesh	8.11.2005	265.9
26	Vembanad Kol Wetland	Kerala	19.8.2002	1512.5
27	Wular Lake	Jammu & Kashmir	23.3.1990	189
		Total Area (*in Sq. km.*)		**11121.31**

However on 28th January 2020, 10 more wetlands to sites were added. After this a total of 37 sites in the country have been recognised under this international treaty.

61. Ans. C.

Recumbent fold has an essentially horizontal axial plane. Linear, fold axial plane oriented at low angle resulting in overturned strata in one limb of the fold. Folds with axial planes dipping at less than 45°, but with zero plunges, have been referred to as recumbent.



62. Ans. B.

The Köppen Climate Classification divides the Earth's climate into five main climate groups:

- A (tropical)
- B (dry)
- C (temperate)
- D (continental)
- E (polar)

The second letter indicates the seasonal precipitation type, while the third letter indicates the level of heat.

The letter code "Cfa" denotes the humid subtropical climate. In these places, the summers are hot and humid with frequent thunderstorms. The winters are comparatively mild and precipitation during this period occurs due to mid-latitude cyclones, usually in areas in and around the southeastern USA.

63. Ans. D.

Organic sedimentary rocks are those containing large quantities of organic molecules. Organic sedimentary rocks are formed from the accumulation and lithification of organic debris, such as leaves, roots, and other plant or animal material. Rocks that were once swampy sediments or peat beds

contain carbon and are black, soft, and fossiliferous often Rich enough in carbon to burn. An important organic sedimentary rock is coal.

Oil Shale is a rock that contains significant amounts of organic material in the form of kerogen. Up to 1/3 of the rock can be solid organic material.

Chalk is a variety of limestone composed mainly of calcium carbonate derived from the shells of tiny marine animals.

64. Ans. C.

The equator runs through Indonesia and splits the island territories of Sumatra, Kalimantan, Sulawesi, and Maluku.

65. Ans. B.

The First Continental Congress was called to order on 5th September, 1774 in which 55 colonial representatives from twelve colonies met at Philadelphia, Pennsylvania to formulate a plan of action.

Important decisions taken at the First Continental Congress included-

• A Plan of Union of Great Britain and the Colonies

• Congress asked the king to address and resolve the specific grievances of the colonies.

• The petition, written by Continental Congressman John Dickinson, laid out what Congress felt was undue oppression of the colonies by the British Parliament. Their grievances mainly had to do with the Coercive Acts, a series of four acts that were established to punish colonists and to restore order in Massachusetts following the Boston Tea Party.

66. Ans. C.

Some Russian socialists formed A Socialist Revolutionary Party in 1900 with an aim to fight for peasant's rights and demanded that land belonging to nobles be transferred to peasants. However, there were differences among Social Democrats and Socialist Revolutionaries about peasants. Lenin felt that peasants were not one united group. Some were poor and others rich, some worked as labourers while others were capitalists who employed workers. With the differences rooting soon, the party was divided over the strategy of the organisation. Vladimir Lenin leader of the Bolshevik group thought that in a repressive society like Tsarist Russia, the party should be disciplined and should control the number and quality of its members. Others, the Mensheviks thought that the party should be open to all (as in Germany).

67. Ans. A.

Wellesley's administration was characterized by the enormous expansion of the military apparatus, which brought about significant changes in the policies of the Company's government. In the six years of Wellesley's administration (1798/99– 1803/4), the army accounted for 42.5 per cent of the Company's total expenditure.

The army was entrusted with the collection and collation of information about Indian ruling families and the assessment of their commercial resources and military capabilities.

He introduced the doctrine of the subsidiary alliance under which the ruler of the allying Indian State was compelled to accept the permanent stationing of a British force within his territory and to pay a subsidy for its maintenance.

68. Ans. A.

Recently PM Narendra Modi has unveiled translated volumes of Vachana in 23 Indian languages on the occasion of Basava Jayanti.

Around twelfth century Karnataka witnessed the emergence of a new movement which was led by a Brahmana named Basavanna (1106-68) a minister in the court of a Kalachuri king. His followers were known as Veerashaivas (heroes of Shiva) or Lingayats (wearers of the linga).

Veerashaivas are the followers of the five peethas (religious centres), called Pancha Peethas.

However, Lingayats continue to be an important community till date.

Both Virashaivas and Lingayats encouraged certain practices disapproved in the Dharmashastras, such as post-puberty marriage and the remarriage of widows.

69. Ans. C.

In Ahmedabad, there were many textile mills. The region was hit by the intense plague which broke out in August 1917 and lasted till January 1918. Now in February 1918, there rose a conflict between the Mill owners and workers on the question of Plague Bonus granted in during the plague to stop the workers from fleeing. The Mill Owners wanted to withdraw the Plague bonus whereas the workers demanded a 50% wage hike. The Mill Owners were willing to settle for 20% wage hike.

Gandhiji was invited by Anasuya Ben Sarabai a social worker and sister of Ambalal Sarabhai a mill-owner. For the cause of workers, Gandhiji sat on Hunger strike. As a result, the workers got a 35% wage hike.

70. Ans. C.

The Big Bang Theory also called the Expanding Universe Hypothesis was initially floated by Edwin Hubble, in 1920. It is one of the most widely accepted theory regarding the origin of the universe. According to this theory roughly 13.8 billion years ago all matter/particle was compacted into a very small space with infinite density and intense heat which is called "Singularity". Suddenly, the Singularity started expanding, and the universe as we know it began.

Nebular Hypothesis was initially proposed by German philosopher Immanuel Kant and later around 1796, it was revised by Mathematician Laplace. According to the Hypothesis the planets were formed out of a cloud of material associated with a youthful sun, which was slowly rotating.

Binary theory was floated around 1900 by geologist Thomas Chrowder Chamberlin and astronomer Forest Ray Moulton. This theory considered that a wandering star approached the sun. As a result, a cigar-shaped extension of the material was separated from the solar surface. As the passing star moved away, the material separated from the solar surface continued to revolve around the sun and it slowly condensed into planets. At a later date, the arguments considered of a companion to the sun to have been coexisting. These arguments are called binary theories.

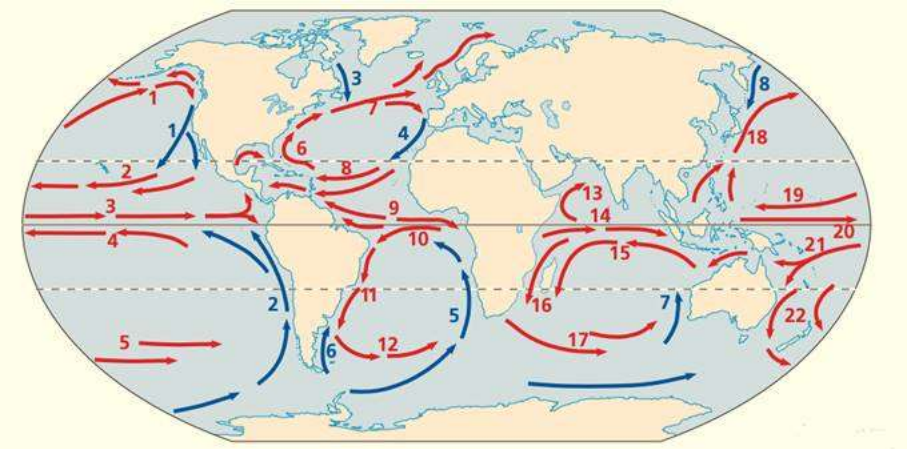
Planetesimal theory advanced the Binary theory and proposed that two universal bodies Proto-sun and its companion star and in this system, there were several small proto-planetary disk with materials from the Proto Sun which were detached when 'Intruding star' passed very close to proto-sun. This material is gradually pulled together by gravity to form small chunks. These chunks get larger and larger until they form planetesimals { A Planetesimal is an object formed from dust, rock, and other materials}. Many of the objects break apart when they collide, but some continue to grow and go on to become planets and moons.

71. Ans. C.

Paradip is one of the Major Ports of India. Late Jawaharlal Nehru, the then Prime Minister of India, laid the foundation stone of the Port on 3rd January 1962 near the Confluence of river Mahanadi and Bay of Bengal. Government of India declared Paradip Port as the Eighth Major Port of India on 18th April 1966 making it the First Major Port in the East Coast commissioned after independence.

72. Ans. A.

Warm ocean currents flow away from the equatorial region on the western side of ocean basins whereas Cold currents flow toward the equator on the eastern side of ocean basins.



Cold Currents -

1. California Current
2. Humboldt Current
3. Labrador Current
4. Canaries Current
5. Benguela Current
6. Falkland Current
7. West Australian Current
8. Okhotsk Current

Warm Currents -

1. North Pacific Drift
2. North Equatorial Current
3. Equatorial Countercurrent
4. South Equatorial Current
5. West Wind Drift

6. Gulf Stream

7. North Atlantic Drift

8. North Equatorial Current

9. Equatorial Countercurrent

10. South Equatorial Current

11. Brazil Current

12. West Wind Drift

13. Monsoon Current

14. Equatorial Countercurrent

15. South Equatorial Current

16. Mozambique Current

17. West Wind Drift

18. Japan Current

19. North Equatorial Current

20. Equatorial Countercurrent

21. South Equatorial Current

22. East Australian Current

73. Ans. A.

Parallel drainage system is a pattern of rivers caused by steep slopes with some relief. Because of the steep slopes, the streams are swift and straight, with very few tributaries, and all flow in the same direction. Such drainage pattern is prominent in places where there is a pronounced slope to the surface or in regions of parallel, elongate landforms like outcropping resistant rock bands.

74. Ans. C.

Indian cropping season is divided into three seasons, namely- Kharif, Rabi and Zaid.

1. **Kharif-** from June to September.

Kharif crops of northern states- Rice, Bajra, Cotton, Maize, Jowar and Toor.

Kharif crop of Southern states- Ragi, Rice, Maize and groundnut.

2. **Rabi-** from October to March.

Rabi crops of northern states- Barley, Wheat, Mustard and gram.

Rabi crop of Southern states- Rice, Maize, Ragi, groundnut

3. **Zaid-** from April to June.

Zaid crops of northern states- Mainly vegetable and fruits

Zaid crop of Southern states- rice and vegetable.

75. Ans. B.

Non-metallic minerals are the minerals that do not contain metals and do not yield new products on melting. They are generally found in sedimentary rocks. They are not as hard as the Metallic mineral and lack shine or lustre of their own. Examples of non-metallic minerals are Mica, Coal, Salt, Phosphate, Clay, Gypsum, Limestone, Marble, etc.

Mica is a naturally occurring non-metallic mineral made up of a series of thin plates of silicates.

Mica is a very good insulator and can withstand high voltage. It is due to this property of Mica that it is extensively used in the electrical and electronics industry. India is the leading producer and exporter of Mica.

76. Ans. B.

Key Points of the 66th National Film Awards-

• Gujarati film Hellaro wins Best Feature Film Award

• Badhaai Ho bags award for Best Popular Film Providing Wholesome Entertainment

• Hindi movie Padman declared Best Film on Social Issues

• Aditya Dhar wins Best Director Award for Uri: The Surgical Strike

• Ayushman Khurana and Vicky Kaushal jointly win Best Actor Award for their performances in Andhadhun and Uri: The Surgical Strike

• Keerthy Suresh bags Best Actress trophy for her performance in Telugu movie Mahanati

• Marathi movie Paani wins the award for Best Film on Environment Conservation/ Preservation.

• Kannada film Ondalla Eradalla gets Nargis Dutt Award for Best Feature Film on National Integration

• Uttarakhand declared Most Film Friendly State

77. Ans. C.

Aishwarya Pissay from Bangalore is a circuit and off-road motorcycle racer. She made history by becoming the first Indian to win a world title in motorsports after she won the FIM World Cup in women's category of the championship in Varpalota, Hungary.

78. Ans. B.

On August 8, 2019, the President of India, Shri Ram Nath Kovind, presented Bharat Ratna Awards to- Shri Nanaji Deshmukh (posthumously), Dr Bhupendra Kumar Hazarika (posthumously) and Shri Pranab Mukherjee.

79. Ans. D.

The indigenously developed Chandrayaan-2 spacecraft are comprising of Orbiter, Lander and Rover. The objectives of Chandrayaan-II Mission were:

• Scientific studies through payloads onboard the orbiter.

• Technology demonstration of soft landing and roving on the lunar surface

The Orbiter is capable of communicating with Indian Deep Space Network (IDSN) at Byalalu as well as the Vikram Lander. The precise launch and mission management has ensured a mission life of almost seven years instead of the planned one year.

The Lander was named Vikram after Dr Vikram A Sarabhai, the Father of the Indian Space Programme. It was designed to function for one lunar day, which is equivalent to about 14 Earth days.

Chandrayaan-2's Rover was a 6-wheeled robotic vehicle named as Pragyan, which translates to 'wisdom' in Sanskrit.

80. Ans. C.

World Humanitarian Day (WHD) is held every year on 19th August to pay tribute to aid workers who risk their lives in humanitarian service, and to rally support for people affected by crises around the world.

World Humanitarian Day 2019 is set to celebrate Women Humanitarians and their undying contribution in making the world a better place. Women Humanitarians hold a sense of unparalleled uniqueness, one that adds to the global momentum of female strength, power and perseverance. It is time to honour the women who have acted as first responders to the darkest hours of crisis.

81. Ans. C.

Ibn Battuta was a Moroccan traveller. He is known for his extensive travels, accounts of which were published in the "Rihla". He visited India during the regime of Muhammad bin Tughlaq.

Duarte Barbosa was Portuguese India officer and was served in India from 1500 till late 1516. He was posted as a scrivener in Cannanore factory and occasionally served as an interpreter of the local language (Malayalam). His Book of Duarte Barbosa (Livro de Duarte Barbosa) is one of the earliest examples of Portuguese travel literature.

Jean-Baptiste Tavernier was a 17th-century French gem merchant and traveller. He is said to have travelled to Persia and India six times between the years 1630 and 1668.

Niccolo Manucci was an Italian traveller who visited India during the reign of Aurangzeb between 1656 to 1687.

82. Ans. D.

The two previous attempts to defeat the French armies- the First Coalition of 1793-1797 and the Second Coalition of 1799-1801 had failed and Britain and France eventually ended up signing a peace agreement- The Treaty of Amiens. With the failure of treaty in 1803 a Third coalition was formed which comprised Prussia, England, Austria, Russia and Sweden. A third coalition was necessary because Napoleon began a quest for military Empire in Europe. He invaded Northern Italy, occupied Switzerland and left a French army of occupation in Holland. He contemplated the second invasion of Egypt and refused commercial treaties with Britain.

83. Ans. B.

The ruins at Hampi were brought to light in 1799 by an engineer and the first British antiquarian who visited the site - Colin Mackenzie who later also became the Surveyor General of India. He visited the ruins, collected some manuscripts and prepared the first survey map of the site. Much of the initial information he received was based on the memories of priests of the Virupaksha temple and the shrine of Pampadevi. His findings motivated many foreigners to visit the site and among them were Alexander Greenlaw, a photographer whose 60 or so waxed-paper negatives from 1856 have miraculously survived and had helped scholars to study them.

84. Ans. B.

The Bengal National College started functioning from 15.Aug.1906 with Aurobindo as its first Principal and educationist Satish Chandra Mukherjee as an Honorary Superintendent. The institution had four departments – Literary, Scientific, Technical & Commercial. However, very soon Sri Aurobindo left the organisation of the college to the Satish Mukherjee and plunged fully into politics. When the famous “Bande Mataram” case was brought against him, he resigned his post in Aug 1907 and resumed it again on his acquittal a month later in Sep 1907. During the 'Alipore Bomb Case',1908 he finally resigned at the request of the College authorities.

85. Ans. A.

Ijarah was a well-known practice in the land-revenue administration under the sultans of Delhi. Ijarah means farming of revenue. Under this system, if a peasant was unable to cultivate his land due to lack of material resources or some natural calamity, the lands were given out on Ijarah to a third party called revenue farmer or "Ijaredar". Ijaredar paid the Government nine-tenth of the whole collection and kept the rest as his collection charges.

However, in the later period, the right of collecting land revenue for a district was sold by public auction to the highest bidders, a new class called Zamindars emerged.

86. Ans. C.

With the ever-increasing threat to railway system from Left Wing Extremists, terrorist/subversive elements, it is imperative that the Railway Protection Force remains better trained and prepared to face growing challenges to railway security. For this very objective, setting up of a separate Commando unit, known as CORAS (Commandos for Railway Security), was announced by Minister of Railways and Commerce & Industry, Shri Piyush Goyal on 14th August 2019.

Vision of CORAS is to develop world level capabilities of specialized response for any situation pertaining to damage, disturbance, disruption of train operations, attack/hostage/hijack/disaster situations in railway areas. The training of RPF commandos includes training in physical endurance, Unarmed Combat, Latest weapons training, Disaster management, Anti Terrorist Operations, among others. RPF commandos are being utilised for securing railway stations, escorting trains and railway area protection in highly vulnerable areas.

87. Ans. A.

Samarth, also known as 'Scheme for Capacity Building in Textile Sector (SCBTS)' aims to skill the youth for fruitful and sustainable employment in the textile sector. The scheme is launched with a view to transforming the unskilled manpower to skilled workforce in various sectors like Garment, knitting, processing, manmade & synthetic fibres and other unorganised textile sector including Traditional sectors like Jute, Silk, Handloom, Handicraft & Carpet by running the certified skill development programme in these sub-sectors across the country.

Objectives of the Samarth Scheme:

• To provide the demand-driven, placement oriented National Skill Qualification Framework (NSQF) compliant skilling programmes to incentivize and supplement the efforts of the industry in creating jobs in

the organized textile and related sectors, covering the entire value chain of textiles, excluding Spinning and Weaving.

• To promote skilling and skill upgradation in the traditional sectors of handlooms, handicrafts, sericulture and jute.

• To enable provision of sustainable livelihood either by wage or self-employment to all sections of the society across the country.

88. Ans. C.

The Geographical Indication (GI) tag is granted by the Department for the Promotion of Industry and Internal Trade. In August 2019, 4 new GIs were registered.

• Palani Pancha-mirtham from Palani Town in Dindigul District of Tamil Nadu State,

• Tawlhlohpuan & Mizo Puanchei from the state of Mizoram and

• Tirur Betel leaf from Kerala.

Tirur betel vine from Kerala, which is mainly cultivated in Tirur, Tanur, Tirurangadi, Kuttippuram, Malappuram and Vengara block panchayaths of Malappuram District, is valued both for its mild stimulant action and medicinal properties. Even though it is commonly used for making pan masala for chewing, it has many medicinal, industrial and cultural usages and is considered as a remedy for bad breath and digestive disorders.

89. Ans. D.

Rajiv Gandhi Khel Ratna Award 2019 was awarded to Ms. Deepa Malik (Para-Athletics) and Sh. Bajrang Punia (Wrestling). Rajiv Gandhi Khel Ratna Award is given for the spectacular and most outstanding performance in the field of sports by a sportsperson over a period of four year.

90. Ans. B.

The first Utkrisht Double-Decker Air-conditioned Yatri (UDAY) Express train started service between Coimbatore and Bangalore in the month of June 2018. UDAY Express will be on busiest routes, which has the potential to increase carrying capacity by almost 40%. The train will have nine double-decker coaches and two power cars; each coach will have a carrying capacity of 50 passengers on the upper deck, 48 passengers on the lower deck as well as 22 on the ends.

91. Ans. B.

The American War of Independence was the result of the oppressive colonial policy of the British colonial government was represented by the British crown. The American in alliance with France defeated the British in the American Revolutionary War that ended in 1775 with the formation of The United States of America.

The main causes of the war were:

• No Representation: the colonies were not given any representation in the British parliament.

• Taxing the colonies without representation – People asserted that the British government had no rights to tax the colonies and they used the slogan 'No Taxation without Representation'.

• Resource draining of the colonies – which was the result of The seven years war (1756-63), that had increased the demand for British industries.

• Import Duties and Export Limitations – Boston Tea Party (1773) as a result of such policies, where tea cartons carried by British ships were thrown at the sea, Britain's right to levy taxes was eroded over time.

92. Ans. B.

Swami Dayananda Saraswati born in 1824. In 1875 he established a Hindu religious and social reform movement in Bombay, known as Arya Samaj.

The principles and objectives of the Arya Samaj were based on Dayanand's idea of social reform, some of which are enlisted below:

• He supported the Varna System but one based on merit and not birth.

• He was of the view that Vedas are the infallible and only truth.

• He opposed idol-worship and reincarnation theory of God and believed in one God theory who has no physical existence.

• He advocated equal status for women in the society and supported widow remarriage, female education and opposed cruel practices like child marriage and Sati.

• Dayanand's 'robust Vedic counterpart' challenged the masculine West that had enslaved the Aryavarta.

93. Ans. C.

The Fifth Schedule under Article 244(1) of the Constitution contains provisions regarding the administration of Scheduled Areas other than in Northeast India.

As per the Article 244 (1) of the Constitution of India, the 'Scheduled Areas' are defined as 'such areas as the President may by order declare to be Scheduled Areas' – as per paragraph 6(1) of the Fifth Schedule of the Constitution of India. The specification of "Scheduled Areas" in relation to a State is by a notified order of the President, after consultation with the Governor of that State. At present, Scheduled Areas have been declared in the States of Andhra Pradesh (including Telangana), Chhattisgarh, Gujarat, Himachal Pradesh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha and Rajasthan.

94. Ans. C.

The Nehru-Mahalanobis strategy of economic development was implemented during the second Five Year Plan. It allowed the states to take centre stage in industrialization and scale the "commanding heights" of the economy.

The Principal components of this development strategy were:

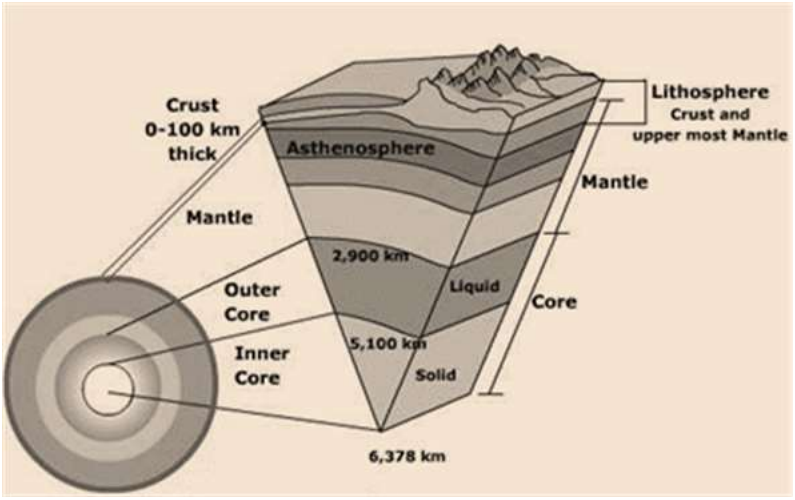
• Restructuring economic dependency on metropolitan capitalism into independent economic development.

• State capitalist and capitalist development on the urban sectors; and

• The transition from semi-feudal agriculture to capitalist farming

95. Ans. C.

Lithosphere is the outer solid part of the earth, including the crust and uppermost mantle. The lithosphere is about 100 km thick and depends on the age; the older lithosphere is thicker. The lithosphere is where tectonic plate action takes place since it is brittle enough at some locations to produce earthquakes by faulting, such as within a sub-ducted oceanic plate.



96. Ans. A.

The outer shell of the earth, the "Lithosphere", is broken up into tectonic plates. These plates are actually pieces of Earth's outer shell and are made up of the earth's crust and upper part of the mantle. These plates float on top of the hotter and more fluid "Asthenosphere", which is the layer below the lithosphere.

The seven major plates are:

1. African Plate

2. Antarctic plate

3. Eurasian plate

4. Indo-Australian plate

5. North American plate

6. Pacific plate

7. South American plate.

97. Ans. D.

Canyons are deep, narrow passage cut through the surface of the Earth with steep cliffs on both sides. Characterized by steep step-like side slopes and maybe as deep as a gorge. Canyons are often formed in mountainous, arid, or semiarid regions where riparian erosion is much greater than erosion from general weathering.

The Grand Canyon, in the state of Arizona, is a product of tectonic uplift. It has been carved, over millions of years, as the Colorado River cuts

down through the Colorado Plateau. The Grand Canyon is between 5 million and 70 million years old.

98. Ans. D.

Stalactites are deposited by dripping water (calzite rich), pointing vertically downwards from the cave ceiling. The drop is formed at the ceiling by water coming down a crack, hold against gravity by the surface tension of the water.

When the dripping Water drop grows and eventually falls down, it again deposits some limestone at the floor and forms a Stalagmite. It is very common that stalagmites and stalactites grew at the same time.

A 'Pillar' is a stalactite and a stalagmite grown together. Pillars are nothing but a later stage of stalactites and stalagmites.

99. Ans. B.

Loktak Lake is a freshwater lake located near Moirang in Manipur. It is also called the Floating lake because of the floating "Phumdis". Phumdis are a heterogeneous mass of vegetation, soil, and organic matters at various stages of decomposition.

The etymology of Loktak is Lok = "stream" and tak = "the end".

The Keibul Lamjao National Park, which is the last natural refuge of the endangered sangai or Manipur brow-antlered deer (Cervus eldi eldi), one of three subspecies of Eld's Deer, covering an area of 40 km2 (15 sq mi), is situated in the southeastern shores of this lake and is the largest of all the Phumdis in the lake.

Considering the ecological status and its biodiversity values, the lake was designated as a wetland of international importance under the Ramsar Convention on March 23, 1990.

100. Ans. B.

The National Research Laboratory for Conservation of Cultural Property (NRLC), established in 1976 under the Ministry of Culture, is the premier organization for the researches in the conservation of the cultural property including monuments and sites, as well as museums, library and archive collections.

NRLC achieve its mission through scientific research, education and training, field projects, collaborations and dissemination of information via

articles in journals, conferences, workshops, publications and public participation.

NRLC is well equipped with adequate infrastructure and laboratories for material analysis and testing, developing sustainable conservation solutions.

NRLC conduct research on materials composition and on art-making techniques, developing methods to slow down deterioration and prevent further damage, providing information on the cause of deterioration and treatment options, devising conservation solutions and assess treatment performance of cultural materials. NRLC published about 205 research papers in peer-reviewed journals of national and international repute and proceedings. NRLC has filed for two patents for its findings in 2019.

101. Ans. C.

Electromagnetic waves are non elastic waves in the sense that they don't really need a material medium for their propagation like sound waves do. They also can move in vacuum

Electromagnetic waves are the waves that are created as a result of vibrations between an electric field and a magnetic field when they are perpendicular to each other. They are also transverse waves which can polarise without any medium, and they do not get deflected, nor they show interference and diffraction.

The speed of EM waves is nearly the speed of light.

102. Ans. C.

The radiation given off by the Sun includes both infrared rays, visible light and ultraviolet rays (short-wavelength). All of these types of radiation are part of the electromagnetic spectrum. Sunlight is the visible and most common type of radiation that is given off by the Sun.

103. Ans. A.

$$\frac{C}{5} = \frac{F-32}{9}$$

$$\frac{C}{5} = 113\text{-}32/9$$

$C = {}^{45^0}C$

NOW, To change in kelvin,

= 45 + 273.15 K

= 318.15 K

104. Ans. D.

- Given that, mass of a body = 2kg

Balloon kept at a height = 50 m

Now, the total energy = mgh

= 2X9.8X50

= 980J

Speed of the body calculated as , $v^2 = u^2 + 2as$

$v^2 = 0 + 2 \times 9.8 \times 50$

$v^2 = 980$

$v = \sqrt{980}$ m/s

105. Ans. D.

The types of electromagnetic radiation are broadly classified into the following classes (regions, bands or types):[5]

1. Gamma radiation

2. X-ray radiation

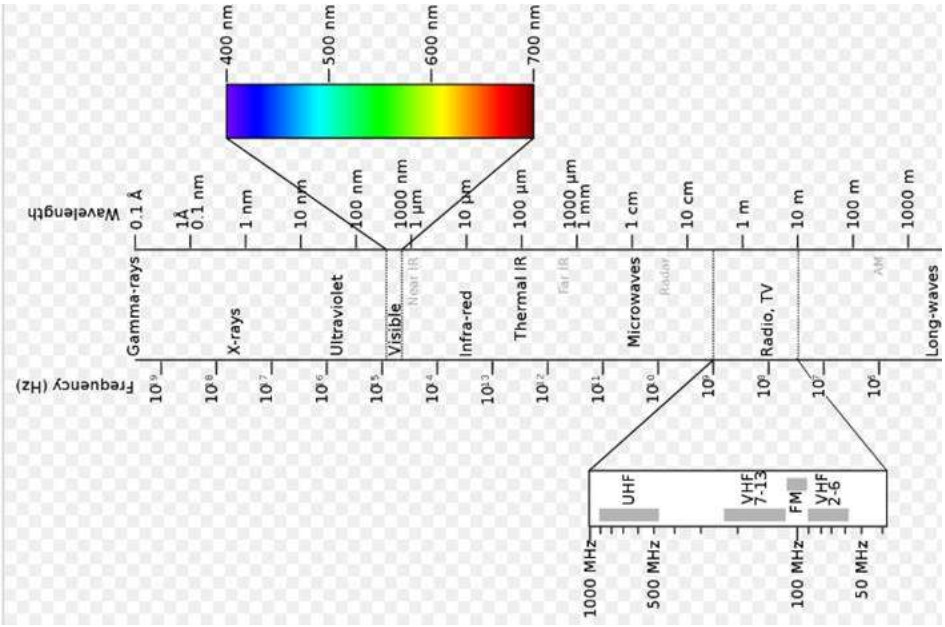
3. Ultraviolet radiation

4. Visible light

5. Infrared radiation

6. Microwave radiation

7. Radio waves



As we can see from the figure the frequency of ultrasound waves is greater than the sound waves and the wavelength is lower than the sound waves.

The speed id also depend on the frequency $(v \propto \upsilon)$.

106. Ans. D.

SCURVY is caused due to deficiency of vitamin C. Symptoms of Scurvy include general malaise and lethargy, progressing on to spotty skin, losing teeth, and bleeding and swollen gums. If left untreated scurvy can be fatal.

RICKETS caused due to deficiency of Vitamin D. It causes the softening of bones in children, usually resulting in fractures and deformities. This is because vitamin D plays a key role in calcium absorption and the building of strong, healthy bones.

RABIES VIRUS causes rabies. The virus infects the brain and ultimately leads to death. After a rabid animal bites someone, the virus is deposited in the muscle and subcutaneous tissue.

HEPATITIS is commonly caused by **viruses , hepatitis A, B, C, D, and E**.

Hepatitis A and E are mainly spread by contaminated food and water.

107. Ans. C.

A virus is a small infectious agent which can replicate only inside the living cells of other organisms. It has a protein coat known as capsid that encloses the genetic material. The genetic material of viruses could be either RNA or DNA. No virus contains both RNA and DNA.

Features of the virus :

It has an ability to reproduce but only in living host cells and the ability to mutate.

Viruses can infect animals, plants, and even other microorganisms.

Viruses lack metabolic machinery of their own and are dependent on their host cell for replication; thus, they cannot be grown in synthetic culture media.

108. Ans. C.

Salmonella paratyphi spreads typhoid. Widal Test is used to detect Typhoid Fever. Reasons are Contaminated water, food, meat, poultry, and eggs. Symptoms of typhoid are food poisoning, gastroenteritis, enteric fever, abdominal cramps. Transmission may be linked to pet reptiles.

Plasmodium falciparum is a unicellular parasite, which causes malaria in humans.

Trypanosoma gambiense is a microscopic parasite of the species Trypanosoma brucei. It is also known as sleeping sickness.

Varicella-zoster is a virus which causes chickenpox. Chickenpox is one of the most infectious diseases.

109. Ans. C.

The thyroid gland regulates the body's *metabolic rate*-controlling heart, muscle and digestive function, brain development and bone maintenance. The correct functioning of this hormone depends on a good supply of iodine from the diet. Cells producing thyroid hormones are very specialized in extracting and absorbing iodine from the blood and incorporate them into the thyroid hormones.

110. Ans. C.

Biogas is a methane-rich fuel gas which is produced by anaerobic breakdown or digestion of biomass with the help of methanogenic bacteria.

Biogas is made up of methane (50-70%), carbon dioxide (30%-40%) with traces of nitrogen, hydrogen sulfide and hydrogen.

111. Ans. A.

In the periodic table, the metallic character of the elements is due to their electron releasing tendency. By losing electrons, metal atoms become positive ions, also known as cations. Therefore these are electropositive in nature. As we go down the group, the metallic character increases because the electron releasing tendency of the atoms tends to increase.

112. Ans. B.

Helium is a monoatomic element. Monotomic elements are the elements that are stable as single atoms, as the word mon0 refers one, In order for an element to be stable, it needs to have a stable octet of valence electrons that is it has its octate complete.

113. Ans. C.

The very large volume of hydrogen can be accommodated by making non-stoichiometric hydrides.

Metallic hydrides are also known as non-stoichiometric hydrides which can only be formed by d-block and f-block elements like Pt, Pd, La, Y etc.

Rest of the elements form either ionic or molecular hydride.

114. Ans. B.

The cathode rays start from the cathode and move towards the anode. These rays glow, when they strike on the fluorescent screen. In the absence of electrical or magnetic field, these rays travel in straight lines. In the presence of the electrical or magnetic field, the behaviour of cathode rays is similar to negatively charged particles, suggesting that the cathode rays consist of negatively charged particles, called electrons. The characteristics of cathode rays (electrons) do not depend upon the material of electrodes and the nature of the gas present in the cathode ray tube.

115. Ans. D.

An optical fibre is a cylindrical dielectric waveguide that transmits light along its axis, by the process known as total internal reflection. The refractive index of the core is high in comparison to the refractive index of cladding in an optical fibre so that that total internal reflection can take place here. Optical fibre works on the principle of Total Internal Reflection

of light. It has its applications in the field of Communication, Broadband Internet, Computer Networking etc.

116. Ans. A.

- The force of gravitational attraction is directly dependent upon the masses of both objects and inversely proportional to the square of the distance that separates their centres. Newton's conclusion about the magnitude of gravitational forces is summarised symbolically as $F \propto \frac{m_1 m_2}{R^2}$

where *m*1 and *m*2 are masses of the object and R is the distance of separation between them.

Now the gravitational force in first system is given as

$$F = k\frac{M \times M}{R^2} = k\left(\frac{M}{R}\right)^2$$

And the gravitational force of 2nd system $= k\frac{(2M)\times(2M)}{\left(\frac{R}{2}\right)^2} = 16k\left(\frac{M}{R}\right)^2 = 16F$

Hence, the magnitude of the gravitational force between them will increase by 16 times.

117. Ans. B.

The loudness of a sound depends on the amplitude of the sound wave. The sound is loud if the amplitude of the sound wave is large. It is directly proportional to the square of the amplitude of vibration. If the amplitude of the sound wave becomes double, then the loudness of the sound will be quadrupled. It is expressed in decibel (dB). Sounds above 80 dB becomes noise to human ears.

118. Ans. A.

- The time period of a pendulum is $2\pi\sqrt{\frac{l}{g}}$, here T is directly proportional to the length and is inversely proportional to $\sqrt{g}$ and independent on mass.

If the length of the first pendulum is l and gravity is g, then the time period of the first pendulum is $T = 2\pi\sqrt{\frac{l}{g}}$

Now, it is given that the length of 2nd pendulum is same but the gravity is $\frac{g}{2}$. Hence the time period $= 2\pi\sqrt{\frac{l}{g/2}} = \sqrt{2}\left(2\pi\sqrt{\frac{l}{g}}\right) = \sqrt{2}T$

119. Ans. A.

The heat generated by the coil = $i^2Rt = \frac{v^2}{R}t$, where i = current,

V = voltage, R is resistance of the coil and t is the time.

Temperature is not directly related to current and voltage, but an increase in current flow through a resistive material causes heating effect and current increases, so voltage must be increased. Therefore, the temperature is a function of resistance, i.e. R{T}. Also, voltage is directly proportional to current via Ohm's Law. So going by this we can say that as the voltage is increased, current increases through the load and the load shows the heating effect.

120. Ans. B.

Panchanan Maheswari uses the embryological characters in taxonomy. He deals with the comparative embryology of gymnosperms and angiosperms, plant tissue culture, and the history of botany in India. He also created the Indian school
of plant embryology and found the International Society of Plant Morpholo gists.

121. Ans. A.

Xylem is made up of several types of cells. Tracheids are long cells which help in transport xylem sap and also provide structural support. Vessel elements are shorter than tracheids, and it helps in conducting water. Vessel elements have perforation plates which connect each vessel element to form one continuous vessel. It also contains parenchyma, a tissue that makes up most of the soft parts of plants, and long fibres which helps to support the plant.

122. Ans. B.

The mitochondria's main role in the cell is to take glucose and use the energy stored in its chemical bonds to make ADENOSINE TRI PHOSPHATE in a process known as cellular respiration. There are three main steps for this process: glycolysis, the citric acid cycle or Krebs cycle, and ATP Synthesis; hence they are also called 'powerhouses' of the cell. The matrix also contains single circular DNA molecule, a few RNA molecules, ribosomes (70S) and the components required for the synthesis of proteins.

123. Ans. D.

Connective tissue provides the structural framework and mechanical support to different tissues forming an organ. It also plays a key role in the body defence, tissue repair, fat storage and transmission of blood vessels to the other tissues.

124. Ans. C.

Osmosis is defined as the movement of a solvent across a **semipermeable membrane**. Osmosis takes place towards a higher concentration of solute and the lower concentration of solvent. Osmosis can occur in other liquids also, and in gases also.

In **diffusion,** molecules move from their higher concentration to lower concentration till the concentration is equal on the other side.

Dispersion is defined as the separation of white light into colours or of any radiation according to wavelength.

Absorption is defined as the act of taking up specific chemical or molecular action; especially the passage of liquids or other substances through a surface of the body into body fluids and tissues.

125. Ans. C.

Dry ice is defined as solidified carbon dioxide. It is used mostly as a cooling agent. Its advantages include lower temperature than that of water *ice* and not leaving any residue like incidental frost from moisture in the atmosphere.

126. Ans. A.

Tin represented as Sn in the periodic table. It is an element which belongs to the carbon family of Group 14 (IVa) of the periodic table. It is a soft, silvery-white metal with a bluish tinge, known to the ancients in bronze, an alloy with copper. It is widely used for plating steel cans used as food

containers, in metals used for bearings, and in solder. Therefore tin is not a mixture.

127. Ans. D.

Soaps clean the surface based on the principle of surface tension. It helps to lower the surface tension of a solution. Soap gets stick to the dust particles and grease, and these dust particles are then removed by the action of water when some mechanical force is exerted on the clothes.

128. Ans. A.

Lime water does not represent the salt calcium carbonate. Lime water is a Calcium hydroxide traditionally known as slaked lime. It is an inorganic compound with the chemical formula $Ca(OH)_2$. It is a colourless crystal or white powder and is obtained when calcium oxide is mixed or slaked with water.

129. Ans. C.

Mass of water, m_1 = 10g

Mass of ice, m_2 = 10 g

Specific heat of water, $s_1 = 1 cal/g - ^oC$

Specific heat of ice, $s_2 = 1\ cal/g - ^oC$

Latent heat of fusion, $L = 80\ cal/g$

Now total required heat $= m_1 s_1 \Delta T + \left(m_2 s_2 \Delta T + m_2 L + m_2 s_1 \Delta T\right)$

$$= 10 \times 1 \times 10 + 10 \times .5 \times \left(0 - (-10)\right) + 10 \times 80 + 10 \times 1 \times 10$$
$$= 100 + 50 + 800 + 100$$
$$= 1050\ cal$$

130. Ans. B.

A concave lens forms an image which is virtual and erect. It always creates a virtual image for a real object.

A convex lens forms a clearer and larger image of an object by focusing the light beam at one point. As the centre of the convex lens is thicker, it makes the object image at the focal point look larger and closer.

131. Ans. B.

- For parallel combination resistance is

$$\frac{1}{R}=\frac{1}{R_1}+\frac{1}{R_2}+\frac{1}{R_3}$$

$$\frac{1}{R}=\frac{1}{2}+\frac{1}{4}+\frac{1}{8}$$

$$\Rightarrow \frac{1}{R}=\frac{7}{8} \Rightarrow R=\frac{8}{7} \text{ ohm}$$

Now, for series combination resistance is

$$R=R_1+R_2$$

$$\Rightarrow R=\frac{8}{7}+1$$

$$\Rightarrow R=\frac{15}{7} \text{ ohm}$$

Hence, option B is the correct answer.

132. Ans. A.

If the work done on the system or by the system is zero, $\Delta W=0$

According to the law of thermodynamics, the change in internal energy is given by $\Delta U=\Delta Q+\Delta W$, where ΔW is work done and ΔQ is the heat change.

If $\Delta W=0$ then $\Delta U=\Delta Q$ or Change in internal energy of the system is equal to the flow of heat in or out of the system.

133. Ans. C.

– The smallest value which can be measured by the measuring instrument is called its **least count**.

A) $0.50\ mm$, the minimum possible measurement is 0.01 mm, $LC = 0.01mm$

B) $29.07\ cm$, the minimum possible measurement is 0.01 cm, $LC = 0.01cm = 0.1mm$

C) $0.925m$, the minimum possible measurement is 0.001 m, $LC = 0.001m = 1\ mm$

D) $910mm$, the minimum possible measurement is 10 mm, $LC = 10mm$

134. Ans. D.

According to the conservation of energy**,** the energy of interacting bodies or particles in a closed system remains constant; in other words, energy can neither be created nor destroyed.

Ohm's law states that "The current through a conductor between two points is directly proportional to the voltage across the two points."

Conservation of momentum, according to this law of the total momentum of an isolated system of interacting particles is conserved.

135. Ans. A.

- The average velocity of an object is its total displacement divided by the total time taken, since the displacement is zero, the average Velocity is also zero.

136. Ans. A.

- The density of substances are P_1 and P_2. Let V volume of both the substances is mixed, now the masses (density x volume)of the substances are VP_1 and VP_2.

Now, the density of the mixture $= \frac{mass}{volume} = \frac{VP_1 + VP_2}{V + V} = 4(given)$

$= \frac{P_1 + P_2}{2} = 4 \Rightarrow P_1 + P_2 = 8$ ...i

Let M mass of both substances are mixed, now the volume $\left(\frac{mass}{density}\right)$ of the substances are $\frac{M}{P_1}\ and\ \frac{M}{P_2}$.

Now, the

$$density\ of\ mixture = \frac{mass}{volume} = \frac{M+M}{\frac{M}{P_1}+\frac{M}{P_2}} = 3(given)$$

$$\Rightarrow \frac{2P_1P_2}{P_1+P_2} = 3$$

$$\Rightarrow \frac{2P_1P_2}{8} = 3$$

$$\Rightarrow P_1P_2 = 12 \qquad ...ii$$

On solving equation (i) and (ii) we get…….

$\rho_1 = 6; \rho_2 = 2$

137. Ans. A.

If the mass and radius of disc and a solid sphere is M and R respectively. then the moment of inertial of disc and solid sphere is given by $\frac{1}{2}MR^2$ and $\frac{2}{5}MR^2$ respectively. So Disc has a higher moment of inertia.

According to the principles of inertia, bodies that have more mass at the centre have lower levels of the moment of inertia, which is directly related to the rate at which an object can spin.

138. Ans. A.

– if an object is moving with a non zero acceleration with initial velocity 'u'. According to the newtons law of motion, the distance covered in time 't' is given by $S = ut + \frac{1}{2}at^2$.

Here, we can see that the distance is dependent on initial velocity 'u' and the square of time 't'.

139. Ans. B.

SOFT SOAP is defined as a semi-fluid soap, which is specially made up of potassium rather than sodium salts. These soaps are characterized by weaker intermolecular forces between the salts.

140. Ans. D.

WATER is a polar molecule .hydrogen bonds are present in liquid water here it can form up to four hydrogen bonds with neighbouring molecules. Water is considered a polar molecule because of the bent

shape of the molecule. It has most of the negative charge from the oxygen on the side of the molecule, and the positive charge of the hydrogen atoms is on the other side of the molecule.

141. Ans. C.

Portland cement is manufactured by using lime(calcium oxide CaO), silica(Silicon di oxide SiO_2), and alumina(Aluminium oxideAl_2O_3).

It is the most common type of cement used all over the world for the commercial process.

It can be modified easily, depending on the raw materials used and the process which is used to combine them.

142. Ans. B.

If we see the crystalline structure of diamond, each carbon atom is linked to four other carbon atoms tetrahedrally by using sp^3 - hybrid orbitals giving rise to a 3-d network of a carbon atom. And because of it, the diamond is very hard.

Graphite has a hexagonal layer structure in which each carbon atom is linked to three other carbon atoms by using sp^2 hybrid orbitals. The hexagonal layer in graphite is held together by weak Van-der Waal's forces. That's why graphite is soft.

143. Ans. D.

Evaporation is a surface phenomenon, as the surface area increases the rate of evaporation increases whereas boiling is considered as a bulk phenomenon because total molecules which include interior molecules along with surface molecules are involved during boiling of liquid. But in the case of evaporation, only surface molecules involved, so it is considered a surface phenomenon.

144. Ans. C.

Soda glass is harder than pyrex glass is not a correct option. Pyrex is a particular blend of Borosilicate glass, which has high heating tolerance. Soda Lime glass is used for glassware which is not directly and strongly heated, for example, Petri dishes or TLC chromatography tanks.

145. Ans. B.

- Oxidation State can be defined as the number of electrons lost, gained or shared in a compound by an element. The compound dilead tetroxide

does not exist. Hence it is an incorrect option. In Mn_3O_4 Mn_3 , one of the atoms of Manganese has an 'Oxidation state' of 2 and two of the atoms of Manganese has an 'oxidation state' of three. In Fe_3O_4 the oxidation state of two atoms of iron is 3 and Oxidation state of one atom of iron is 2. Here, the correct option is Fe_2O_3 since the oxidation state is 3 for all atoms.

146. Ans. B.

The sudden change will be in momentum (P=mv) of the ball as the velocity will change suddenly after the bouncing off the ground. The **kinetic energy** (KE) of an object is the energy that it possesses due to its **motion**.

Potential energy (PE) is defined as mechanical energy, stored energy, or energy caused by its **position**.

147. Ans. D.

- Ohm's law states that the current through a conductor between two points is directly proportional to the voltage difference across the two points. It also states that in a conducting device, ohms law is not dependent on magnitude and polarity of applied voltage as well as the direction of the applied electric field.

148. Ans. C.

-During the process of thermal radiation, the heat waves travel along straight lines with the speed of light. Thermal radiation is emitted by matter as a result of vibrational and rotational movement of the molecule. It includes ultraviolet radiation, all visible and infrared radiation. It does not require any medium and energy is transported by electromagnetic waves; hence it is also the fastest method.

149. Ans. B.

If an object having some chemicals inside it and it starts moving with a uniform velocity than chemical reactions happening in the system cannot change the kinetic energy of the particles inside with respect to the centre of mass of an object.

150. Ans. A.

The MOI of ring and disc of same weight and mass is given by

$\frac{1}{2}MR^2$ *and* $\frac{1}{4}MR^2$.

The kinetic energy is given by $I\omega^2$ .The ring has higher kinetic energy than the disc. This is because the kinetic energy of the ring is $\frac{1}{2}\omega^2 MR^2$ while that of the ring is $\frac{1}{4}\omega^2 MR^2$.

Hence, the kinetic energy of ring > kinetic energy of disc.