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Q.1) Consider the following statements regarding Geostationary Orbit:

1. Satellites in Geostationary Orbit circle Earth from East to West.
2. Telecommunication Satellites are generally placed in Geostationary Orbit.

Which of the statements given above is/are *NOT CORRECT*?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.1) Solution (a)

Satellites in Geostationary Orbit circle Earth from West to East following Earth's rotation.

Hence Statement 1 is incorrect.

Geostationary Orbit is used by satellites that need to stay constantly above one particular place over Earth, such as telecommunication satellites.

Hence Statement 2 is correct.

Q.2) Consider the following statements Geosynchronous Orbit:

1. A spacecraft in Geosynchronous Orbit appears to remain above Earth at a constant longitude.
2. Geosynchronous Orbit can be considered as a specific case of Geostationary Orbit.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.2) Solution (a)

A spacecraft in Geosynchronous Orbit appears to remain above Earth at a constant longitude.

Hence Statement 1 is correct.

Geostationary orbit can be considered as a specific case of Geosynchronous Orbit. Geostationary orbit (GEO) is an orbit above Earth's equator, whereas Geosynchronous Orbit is any orbit with a period equal to Earth's rotation period.

Hence Statement 2 is incorrect.

Q.3) Consider the following statements regarding:

1. Low Earth Orbit is relatively close to Earth Surface at an altitude of 15km-60km (above Earth Surface).
2. International Space Station orbits around the Earth in the Low Earth Orbit.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.3) Solution (b)

Low Earth Orbit is relatively close to Earth Surface at an altitude of 160km-1000km (above Earth Surface).

Hence Statement 1 is incorrect.

International Space Station orbits around the Earth in the Low Earth Orbit.

Hence Statement 2 is correct.

Q.4) Consider the following statements:

1. Satellites in polar orbits usually travel past Earth from north to south rather than from west to east.
2. Satellites in Sun-synchronous orbit are synchronised to be in the same fixed position relative to the Sun.

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

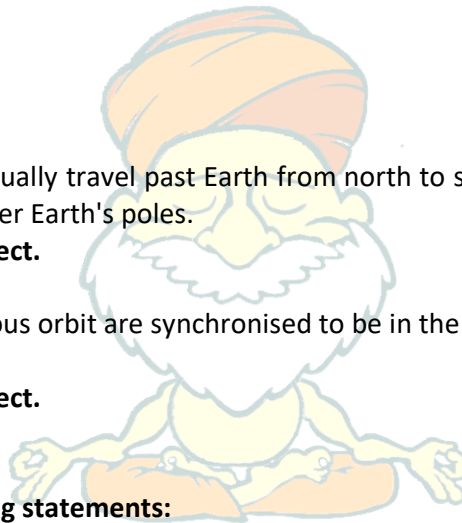
Q.4) Solution (d)

Satellites in polar orbits usually travel past Earth from north to south rather than from west to east, passing roughly over Earth's poles.

Hence Statement 1 is correct.

Satellites in Sun-synchronous orbit are synchronised to be in the same fixed position relative to the Sun.

Hence Statement 2 is correct.

**Q.5) Consider the following statements:**

1. Eccentricity is a measure of how circular or elliptical an orbit is.
2. Inclination is the angular distance of the orbital plane from the plane of the planet's equator.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.5) Solution (c)

Eccentricity is a measure of how circular or elliptical an orbit is.

Hence Statement 1 is correct.

Inclination is the angular distance of the orbital plane from the plane of the planet's equator.

Nodes are points where an orbit crosses a reference plane, such as the ecliptic or the celestial equator.

Hence Statement 2 is correct.

Q.6) Which of these discoveries is a landmark evidence of Big Bang theory?

- a) Quasars
- b) The first exoplanet 51 Pegasi b
- c) Cosmic Microwave Background Radiation
- d) Supernova

Q.6) Solution (c)

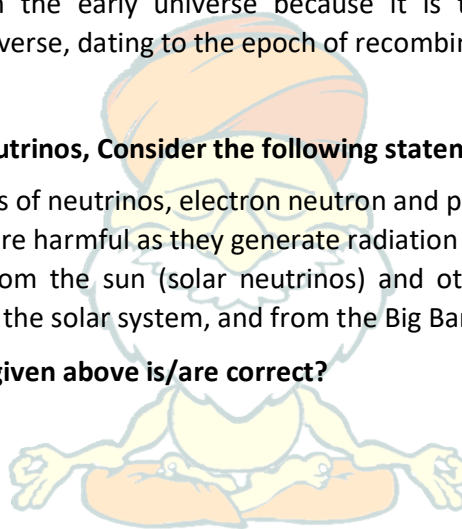
- The cosmic microwave background (CMB) is electromagnetic radiation as a remnant from an early stage of the universe in Big Bang cosmology.
- The CMB is a faint cosmic background radiation filling all space that is an important source of data on the early universe because it is the oldest electromagnetic radiation in the universe, dating to the epoch of recombination.

Q.7) With reference to neutrinos, Consider the following statements:

1. There are two types of neutrinos, electron neutron and proton neutrino.
2. Natural neutrinos are harmful as they generate radiation and can cause diseases.
3. Neutrinos come from the sun (solar neutrinos) and other stars, cosmic rays that come from beyond the solar system, and from the Big Bang.

Which of the statements given above is/are correct?

- a) 1 only
- b) 1 and 3 only
- c) 2 and 3 only
- d) 3 only



Q.7) Solution (d)

Three types or "flavours" of neutrino exist: the electron neutrino, the muon neutrino and the tau neutrino.

Hence Statement 1 is incorrect.

Neutrino has a very tiny mass. It interacts very weakly with other matter particles and so weak that every second trillions of neutrinos fall on us and pass through our bodies unnoticed.

Hence Statement 2 is incorrect.

Neutrinos come from the sun (solar neutrinos) and other stars, cosmic rays that come from beyond the solar system, and from the Big Bang

Hence Statement 3 is correct.

Q.8) Which of the following statements is/are correct with reference to the Black holes:

1. A black hole is a place in space where gravity pulls so much that even light cannot get out.
2. Density of black hole is neither very low nor very high.
3. Stellar black holes are made when the center of a very big star falls in upon itself, or collapses.

Select the correct answer using the code given below:

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

Q.8) Solution (c)

A black hole is a place in space where gravity pulls so much that even light cannot get out.

Hence Statement 1 is correct.

Density of black hole is very high.

Hence Statement 2 is incorrect.

Stellar black holes are made when the center of a very big star falls in upon itself, or collapses.

Hence Statement 3 is correct.

Q.9) With reference to Gravitational Waves, Consider the following statements:

1. Gravitational waves can be produced by Humans, Cars and Aeroplanes.
2. The strongest gravitational waves are produced by catastrophic events such as colliding black holes, the collapse of supernovae and the remnants of gravitational radiation created by the birth of the Universe itself.

Which of the statements given above is/are *NOT CORRECT*?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.9) Solution (d)

Gravitational waves can be produced by Humans, Cars and Aeroplanes.

Hence Statement 1 is correct.

The strongest gravitational waves are produced by catastrophic events such as colliding black holes, the collapse of supernovae and the remnants of gravitational radiation created by the birth of the Universe itself

Hence Statement 2 is correct.

Q.10) Consider the following statements with reference to India's solar mission Aditya-L1:

1. Aditya L1 is the first satellite to study the magnetic field of the sun's corona.
2. Aditya L1 will help to study that why the photosphere, the deeper layer of the sun is at much lower temperature than the corona.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.10) Solution (c)

Aditya L1 is the first satellite to study the magnetic field of the sun's corona.

Hence Statement 1 is correct.

Aditya L1 will help to study that why the photosphere, the deeper layer of the sun is at much lower temperature than the corona.

Hence Statement 2 is correct.

Q.11) Consider the following statements regarding Astra missile:

1. Astra has a range of more than 100 km.
2. Astra is a Beyond Visual Range Air-to-Air Missile.

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.11) Solution (d)

Astra has a range of more than 100 km. The missile has midcourse guidance and RF seeker based terminal guidance to achieve target destruction with pin point accuracy.

Hence Statement 1 is correct.

Astra is a Beyond Visual Range Air-to-Air Missile (BVRAAM).

Hence Statement 2 is correct.

Q.12) Consider the following statements regarding Pinaka Missile System:

1. Pinaka missile system was developed by Hindustan Aeronautics Limited (HAL).

2. The Pinaka MK-II Rocket is modified as a missile by integrating with the Navigation which is aided by GPS.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.12) Solution (d)

Pinaka missile system has been jointly developed by Defence Research and Development Organisation (DRDO) laboratories. The Pinaka is an Artillery Missile System capable of striking into enemy territory up to a range of 75 kilometres with high precision.

Hence Statement 1 is incorrect.

The Pinaka MK-II Rocket is modified as a missile by integrating with the Navigation which is aided by the Indian Regional Navigation Satellite System (IRNSS).

Hence Statement 2 is incorrect.

Q.13) Which of the following Country participated in joint military training exercise Shakti-2019 with India:

- a) Nepal
- b) France
- c) Germany
- d) America

Q.13) Solution (b)

Shakti-2019 is a joint military training exercise between India and France. The aim of the exercise was to achieve interoperability, to acquaint each other with operational procedures, combat drills and understand the functioning in such a situation. It was evident that both the armies were able to achieve this aim.

Q.14) Consider the following statements:

- 1. INS Vela is the first Frigate of Class of P17A Frigates.
- 2. INS Khanderi is the second submarine of Scorpene class (Project 75).

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.14) Solution (a)

The first of Class of P17A Frigates, 'Nilgiri' was launched recently at Mazagon Dock Limited (MDL), Mumbai.

Hence Statement 1 is incorrect.

INS Khanderi is the second submarine of Scorpene class (Project 75).

Hence Statement 2 is correct.

Q.15) Consider the following statements:

1. GISAT-1 is the first state-of-the-art agile Earth observation satellite which will be placed in a Geosynchronous Transfer Orbit by GSLV-F10.
2. GISAT-1 will facilitate near real time observation of the Indian sub-continent, under cloud free condition, at frequent intervals.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.15) Solution (c)

GISAT-1 is the first state-of-the-art agile Earth observation satellite which will be placed in a Geosynchronous Transfer Orbit by GSLV-F10. Subsequently, the satellite will reach the final geostationary orbit using its onboard propulsion system.

A 4 metre diameter Ogive shaped payload fairing is being flown for the first time in this GSLV flight. This is the fourteenth flight of the GSLV.

Hence Statement 1 is correct.

Operating from geostationary orbit, GISAT-1 will facilitate near real time observation of the Indian sub-continent, under cloud free condition, at frequent intervals.

Hence Statement 2 is correct.

Q.16) Chemical weapons are classified as weapons of mass destruction (WMD). One of the very famous WMD is Sarin, used as a chemical weapon due to its extreme potency as a nerve agent. It contains

- a) Sulphur, Fluorine and Oxygen
- b) Nitrogen, Sulphur and Oxygen
- c) Phosphorous, Sulphur and Oxygen
- d) Phosphorous, Fluorine and Oxygen

Q.16) Solution (d)

Nerve agents are a class of phosphorus-containing organic chemicals (organophosphates) that disrupt the mechanisms by which nerves transfer messages to organs.

Sarin was once in news due to Syria, recently Sarin was found in a mail bag outside Facebook's Office.

Q.17) With reference to The Chief of Defence Staff (CDS), Consider the following statements:

1. CDS will be the Permanent Chairman of the Chiefs of Staff Committee.

2. CDS will act as the Principal Military Adviser to Minister for Defence on all tri-Services matters.
3. The Chief of Defence Staff will also head the Department of Military Affairs (DMA).

Which of the statements given above is/are correct?

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

Q.17) Solution (d)

CDS will be the Permanent Chairman of the Chiefs of Staff Committee.

Hence Statement 1 is correct.

CDS will act as the Principal Military Adviser to Minister for Defence on all tri-Services matters.

Hence Statement 2 is correct.

The Chief of Defence Staff will also head the Department of Military Affairs (DMA), Ministry of Defence.

Hence Statement 3 is correct.

Q.18) Consider the following statements about The Indian Nuclear Power Programme.

1. In the first stage of the programme, natural uranium fueled pressurized heavy water reactors (PHWR) produce electricity while generating plutonium-239 as by-product.
2. The Stage II Fast Breeder Reactors are designed to "breed" more fuel than they consume.
3. The Stage III reactor or an Advanced nuclear power system involves a self-sustaining series of thorium-232-uranium-233 fueled reactors.

Which of the above statements is/are correct?

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

Q.18) Solution (d)

In the first stage of the programme, natural uranium fueled pressurized heavy water reactors (PHWR) produce electricity while generating plutonium-239 as by-product.

Hence Statement 1 is correct.

The Stage II Fast Breeder Reactors are designed to "breed" more fuel than they consume.

Hence Statement 2 is correct.

The Stage III reactor or an Advanced nuclear power system involves a self-sustaining series of thorium-232-uranium-233 fueled reactors.

Hence Statement 3 is correct.

Q.19) Which of the following statements is/are correct about 'Anti Tank NAG' Missile?

1. It has been indigenously developed under the Integrated Guided Missile Development Programme (IGMDP)
2. It is a fire and forget missile.
3. It can be launched from land, water and air based platforms.

Select the correct answer using the code given below:

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

Q.19) Solution (a)

It has been indigenously developed under the Integrated Guided Missile Development Programme (IGMDP)

Hence Statement 1 is correct.

It is a fire and forget, heat seeking guided missile.

Hence Statement 2 is correct.

It can be launched from land and air based platforms.

Hence Statement 3 is incorrect.



Q.20) Which of the following statements are correct regarding Parker Solar Probe?

1. Parker Solar Probe uses Mercury's gravity to gradually bring its orbit closer to Sun.
2. Parker Solar Probe is a joint mission of NASA, European Space Agency and ROSCOSMOS.

Select the correct answer using the code given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.20) Solution (d)

Parker Solar Probe uses Venus' gravity during seven flybys over nearly seven years to gradually bring its orbit closer to the Sun.

Hence Statement 1 is incorrect.

Parker Solar Probe is a mission by NASA. The primary science goals for the mission are to trace how energy and heat move through the solar corona and to explore what accelerates the solar wind as well as solar energetic particles.

Hence Statement 2 is incorrect.

Q.21) Consider the following statements:

1. Endonucleases remove nucleotides from the ends of the DNA.
2. Exonucleases make cuts at specific positions within the DNA.

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.21) Solution (c)

Exonucleases remove nucleotides from the ends of the DNA.

Hence Statement 1 is incorrect.

Endonucleases make cuts at specific positions within the DNA.

Hence Statement 2 is incorrect.

Q.22) Consider the following statements:

1. A plasmid can be used as vector to deliver an alien piece of DNA into the host organism.
2. The cutting of DNA at specific locations is not possible.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.22) Solution (a)

A plasmid can be used as vector to deliver an alien piece of DNA into the host organism.

Hence Statement 1 is correct.

The cutting of DNA at specific locations became possible with the discovery of the so-called 'molecular scissors'— restriction enzymes.

Hence Statement 2 is incorrect.

Q.23) Consider the following statements regarding introduction of alien DNA into host cells:

1. In a method known as biolistics, recombinant DNA is directly injected into the nucleus of an animal cell.

2. In another method, suitable for plants, cells are bombarded with high velocity micro particles of gold or tungsten coated with DNA in a method known as gene gun.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.23) Solution (b)

In a method known as micro-injection, recombinant DNA is directly injected into the nucleus of an animal cell.

Hence Statement 1 is incorrect.

In another method, suitable for plants, cells are bombarded with high velocity micro particles of gold or tungsten coated with DNA in a method known as biolistics or gene gun.

Hence Statement 2 is correct.

Q.24) Consider the following statements:

1. Asexual reproduction preserves the genetic information, while sexual reproduction permits variation.
2. Traditional hybridisation procedures used in plant and animal breeding, very often lead to inclusion and multiplication of undesirable genes along with the desired genes.

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.24) Solution (d)

Asexual reproduction preserves the genetic information, while sexual reproduction permits variation.

Hence Statement 1 is correct.

Traditional hybridisation procedures used in plant and animal breeding, very often lead to inclusion and multiplication of undesirable genes along with the desired genes.

Hence Statement 2 is correct.

Q.25) Consider the following statements:

1. In a chromosome there is a specific DNA sequence called the origin of replication, which is responsible for initiating replication.
2. An alien DNA is linked with the origin of replication, so that, this alien piece of DNA can replicate and multiply itself in the host organism.

Which of the statements given above is/are correct?

- a) 1 only

- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.25) Solution (c)

In a chromosome there is a specific DNA sequence called the origin of replication, which is responsible for initiating replication.

Hence Statement 1 is correct.

An alien DNA is linked with the origin of replication, so that, this alien piece of DNA can replicate and multiply itself in the host organism.

Hence Statement 2 is correct.

Q.26) In which of the parts of a cell, DNA is found?

- a) Nucleus
- b) Endoplasmic reticulum
- c) Golgi Apparatus
- d) None of the above

Q.26) Solution (a)

Deoxyribonucleic acid DNA is a molecule that carries the genetic instructions used in the growth, development, functioning and reproduction of all known living organisms and many viruses. DNA and RNA are nucleic acid (Found in the nucleus of a cell) ; alongside proteins, lipids and complex carbohydrates (polysaccharides), they are one of the four major types of macromolecules that are essential for all known forms of life.

A small amount of DNA can also be found in Mitochondria.

Q.27) Consider the following statements regarding IndiGen initiative:

1. The initiative was undertaken by Indian Council of Medical Research.
2. Under the initiative the whole genome sequencing of the whole population of Kerala, Bihar was conducted.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.27) Solution (d)

The initiative was undertaken by The Council of Scientific & Industrial Research (CSIR).

Hence Statement 1 is incorrect.

CSIR has conducted Whole Genome Sequencing of 1,008 Indians from different populations across the country

Hence Statement 2 is incorrect.

Q.28) Consider the following statements.

1. Cloning of organisms is not possible through asexual reproduction.
2. Cloning does not occur naturally.

Which of the above statements is/are correct?

- a) 1 only
- b) 1 and 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.28) Solution (d)

Cloning of organisms is possible through asexual reproduction.

Hence Statement 1 is incorrect.

In some cases, cloning do occur naturally.

Hence Statement 2 is incorrect.

Q.29) Which among the following are examples of biotechnology?

1. Beer brewing
2. Cloning
3. Gene Therapy

Select the correct answer using the code given below:

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

Q.29) Solution (d)

Biotechnology is the use of an organism, or a component of an organism or other biological system, to make a product or process for a specific use.

Q.30) Which of the following statements are correct about DNA and RNA?

1. All four Bases present in DNA and RNA are same, but their combination is different.
2. Both DNA and RNA are double stranded.

Select the correct answer using the code given below:

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.30) Solution (d)

Base pairing in case of DNA: A-T (Adenine-Thymine), G-C (Guanine-Cytosine)

Base pairing in case of RNA: A-U (Adenine-Uracil), G-C (Guanine-Cytosine)

Hence Statement 1 is incorrect.

DNA is typically a double- stranded molecule with a long chain of nucleotides. RNA is typically a single-stranded molecule in most of its biological roles and has a shorter chain of nucleotides.

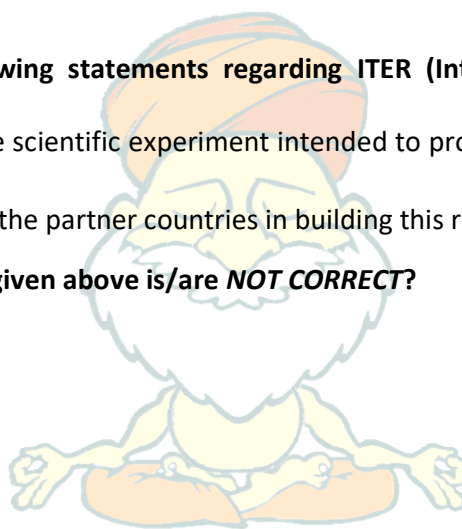
Hence Statement 2 is incorrect.

Q.31) Consider the following statements regarding ITER (International Thermonuclear Experimental Reactor):

1. ITER is a large-scale scientific experiment intended to prove the viability of fission as an energy source.
2. India is also one of the partner countries in building this reactor.

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

**Q.31) Solution (a)**

ITER is a large-scale scientific experiment intended to prove the viability of fusion as an energy source.

Hence Statement 1 is incorrect.

ITER is currently under construction in the south of France. In an unprecedented international effort, seven partners—China, the European Union, India, Japan, Korea, Russia and the United States—have pooled their financial and scientific resources to build the biggest fusion reactor in history.

Hence Statement 2 is correct.

Q.32) Consider the following statements:

1. In Nuclear fission, the nucleus of a heavy atom is bombarded with low-energy neutrons.
2. Nuclear fission reactions are the source of energy in the Sun.

Which of the statements given above is/are correct?

- a) 1 only

- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.32) Solution (a)

In Nuclear fission, the nucleus of a heavy atom (such as uranium, plutonium or thorium), when bombarded with low-energy neutrons, can be split apart into lighter nuclei

Hence Statement 1 is correct.

Nuclear fusion reactions are the source of energy in the Sun and other stars.

Hence Statement 2 is incorrect.

Q.33) Consider the following statements:

1. The hydrogen bomb is based on thermonuclear fusion reaction.
2. A nuclear bomb based on the nuclear fusion of uranium or plutonium is placed at the core of the hydrogen bomb.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.33) Solution (a)

The hydrogen bomb is based on thermonuclear fusion reaction.

Hence Statement 1 is correct.

A nuclear bomb based on the fission of uranium or plutonium is placed at the core of the hydrogen bomb.

Hence Statement 2 is incorrect.

Q.34) Consider the following statements:

1. Uranium ore mined in India are of very low grade as compared to those available in other countries.
2. Uranium Corporation of India Limited is a Public Sector Enterprise under the Ministry of Mines.

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.34) Solution (b)

Uranium ore mined in India are of very low grade as compared to those available in other countries.

Hence Statement 1 is correct.

Uranium Corporation of India Limited is a Public Sector Enterprise under the Department of Atomic Energy.

Hence Statement 2 is incorrect.

Q.35) Consider the following statements:

1. Nuclear Power Corporation of India Limited (NPCIL) is a Public Sector Enterprise under the administrative control of the Department of Atomic Energy (DAE).
2. NPCIL is responsible for design, construction, commissioning and operation of nuclear power reactors.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.35) Solution (c)

Nuclear Power Corporation of India Limited (NPCIL) is a Public Sector Enterprise under the administrative control of the Department of Atomic Energy (DAE), Government of India.

Hence Statement 1 is correct.

NPCIL is responsible for design, construction, commissioning and operation of nuclear power reactors.

Hence Statement 2 is correct.

Q.36) Which of the following is/are the applications of biotechnology:

1. Therapeutics and Diagnostics
2. Genetically modified crops for agriculture
3. Bioremediation and waste treatment
4. Energy production

Choose the correct answers using the codes given below.

- a) 1, 2 and 3 only
- b) 2, 3 and 4 only
- c) 1 and 2 only
- d) 1, 2, 3 and 4

Q.36) Solution (d)

The applications of biotechnology include therapeutics, diagnostics, genetically modified crops for agriculture, processed food, bioremediation, waste treatment, and energy production.

Q.37) Consider the following statement about induced pluripotent stem cells (iPSC).

1. They are derived from embryonic stem cells.
2. The tissues derived from these iPSC can avoid rejection by the immune system.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.37) Solution (b)

Induced pluripotent stem cells (iPSC) produced by genetically manipulating human skin cells to produce embryonic-like stem cells that are capable of forming any cell types of the body.

Hence Statement 1 is incorrect.

Tissues derived from iPSCs will be a nearly identical match to the cell donor and thus probably avoid rejection by the immune system.

Hence Statement 2 is correct.

Q.38) Which of the following reasons make Escherichia coli suitable for gene cloning?

1. The E. coli genome was the first to be completely sequenced
2. It grows slowly for days and gives a stable condition for observation
3. E. coli is naturally found in the intestinal tracts of humans and animals

Select the correct answer using the code given below:

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

Q.38) Solution (c)

The E. coli genome was the first to be completely sequenced

Hence Statement 1 is correct.

Under ideal conditions, E. coli cells can double in number after only 20 minutes.

Hence Statement 2 is incorrect.

E. coli is naturally found in the intestinal tracts of humans and animals

Hence Statement 3 is correct.

Q.39) Consider the following statements with regard to Atomic Energy Regulatory Board (AERB)

1. AERB is engaged in the development of nuclear power technology, applications of radiation technologies in the fields of agriculture, medicine, industry, and basic research.
2. The regulatory authority of AERB is derived from the rules and notifications promulgated under the Atomic Energy Act and the Environment (Protection) Act, 1986.
3. The AERB reports to the Atomic Energy Commission.

Which of the statements given above is/are correct?

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

Q.39) Solution (c)

Department of Atomic Energy (not AERB), established in 1954 is engaged in the development of nuclear power technology, applications of radiation technologies in the fields of agriculture, medicine, industry, and basic research.

Hence Statement 1 is incorrect.

The regulatory authority of AERB is derived from the rules and notifications promulgated under the Atomic Energy Act and the Environment (Protection) Act, 1986.

Hence Statement 2 is correct.

The AERB reports to the Atomic Energy Commission, which is a high level policy making body for the all atomic energy matters in the country.

Hence Statement 3 is correct.

Q.40) Consider the below statement with regard to human genome sequencing:

1. India is among the league of countries who have demonstrated the capability of mapping all the genes of a human.
2. The world's first human genome sequence was completed in 2003 by the International Human Genome Project, to which Indian scientists had also contributed.

Which of the statements given above is/are *NOT CORRECT*?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.40) Solution (b)

India is among the league of countries who have demonstrated the capability of mapping all the genes of a human.

Hence Statement 1 is correct.

The world's first human genome sequence was completed in 2003 by the International Human Genome Project with scientists from the US, UK, France, Germany, Japan and China.

Hence Statement 2 is incorrect.

Q.41) Consider the following statements regarding recent ban on various apps by Government of India:

1. Ministry of Science and Technology has invoked its power under section 69A of the Information Technology Act to ban these apps.
2. The Indian Cyber Crime Coordination Centre is under the Ministry of Information Technology.

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.41) Solution (c)

Ministry of Information Technology has invoked its power under section 69A of the Information Technology Act to ban these apps.

The Indian Cyber Crime Coordination Centre, Ministry of Home Affairs has also sent an exhaustive recommendation for blocking these malicious apps.

Hence Statement 1 is incorrect.

The Indian Cyber Crime Coordination Centre is under the Ministry of Home Affairs.

Hence Statement 2 is incorrect.

Q.42) Consider the following statements regarding Global Partnership on Artificial Intelligence (GPAI):

1. India is one of the founding members of GPAI.
2. The GPAI will bring together experts from industry, government, civil society and academia to conduct research and pilot projects on AI.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.42) Solution (c)

India is one of the founding members of GPAI.

GPAI will be supported by a Secretariat, to be hosted by Organization for Economic Cooperation and Development (OECD) in Paris, as well as by two Centers of Expertise- one each in Montreal and Paris.

Hence Statement 1 is correct.

The GPAI will bring together experts from industry, government, civil society and academia to conduct research and pilot projects on AI.

Hence Statement 2 is correct.

Q.43) Consider the following statements about Responsible AI for Youth Programme:

1. The program is designed by Microsoft and Intel India.

2. The Program will be open to students from all the Schools of 8th to 12th class across the country.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.43) Solution (d)

National e-Governance Division, Ministry of Electronics and Information Technology, Government of India and Intel India have designed a National Program for Government Schools: Responsible AI for Youth.

The aim of this program is to empower youth to become 'AI ready' and help reduce the AI skill gap in India.

Hence Statement 1 is incorrect.

The Program will be open to students from Government Schools, classes 8 – 12 across the country.

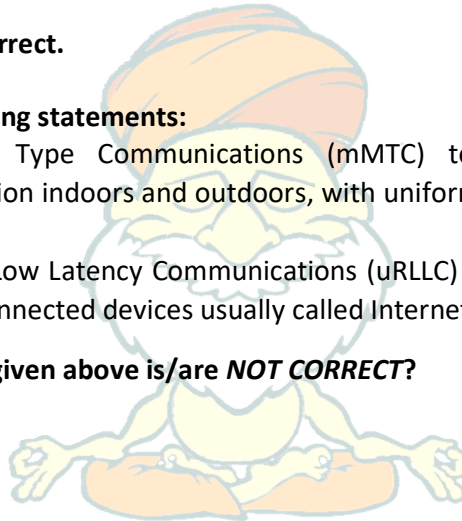
Hence Statement 2 is incorrect.

Q.44) Consider the following statements:

1. Massive Machine Type Communications (mMTC) technology supports ultra-highspeed connection indoors and outdoors, with uniform quality of service, even at the cell edge.
2. Ultra-reliable and Low Latency Communications (uRLLC) technology supports a very large number of connected devices usually called Internet of Things (IoT).

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2



Q.44) Solution (c)

Enhanced Mobile Broadband (eMBB) technology supports ultra-highspeed connection indoors and outdoors, with uniform quality of service, even at the cell edge.

Hence Statement 1 is incorrect.

Massive Machine Type Communications (mMTC) technology supports a very large number of connected devices usually called Internet of Things (IoT).

Hence Statement 2 is incorrect.

Q.45) Consider the following statements:

1. Centre of Excellence (CoE) in Blockchain Technology has been setup by National Informatics Centre (NIC).

2. Center of Excellence in Artificial Intelligence has been setup by National Informatics Centre (NIC).

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.45) Solution (c)

NIC has set up Centre of Excellence (CoE) in Blockchain Technology with an objective to promote its use and facilitate rapid adoption & on-boarding of Blockchain based solutions.

Hence Statement 1 is correct.

CoE in AI by NIC has been established with the motto of 'Inclusive AI' for responsive governance, to work towards improving Govt. service delivery to citizens.

Hence Statement 2 is correct.

Q.46) Which of the following statements is/are correct regarding 'Cryptojacking'?

- a) It refers to the use of encrypted code to hijack a Crypto network.
- b) It refers to use of malware to hack the official sites and data of Banks.
- c) It is the secret use of a computer device to mine cryptocurrency.
- d) It is a software which decrypts an encrypted data.

Q.46) Solution (c)

Cryptojacking is defined as the secret use of your computing device to mine cryptocurrency.

Hence Statement c is correct.

Q.47) Deep Learning is an aspect of Artificial Intelligence (AI). Which of the following statements correctly describe Deep learning?

- a) It allows machine to emulate the learning process of human beings to gain certain type of knowledge.
- b) It allows students to memorise the details quickly and permanently.
- c) It is a voice command system, where once a command is given will be automatically remembered by the machine till it is changed.
- d) It helps the user to gain knowledge by the way in which the machines learn through system feed.

Q.47) Solution (a)

It allows machine to emulate the learning process of human beings to gain certain type of knowledge.

Hence Statement a is correct.

Q.48) Which of the following statements is/are correct with respect to Blockchain:

1. It is an interlinked list of records which is secured using cryptography.
2. The process becomes more transparent, as block chain eliminates the need for a middleman in transactions.
3. Blockchain manages three important roles; it records the transactions, establishes the identity and establishes the contracts.

Select the correct answer using the code given below:

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

Q.48) Solution (d)

It is an interlinked list of records which is secured using cryptography.

Hence Statement 1 is correct.

The process becomes more transparent, as block chain eliminates the need for a middleman in transactions.

Hence Statement 2 is correct.

Blockchain manages three important roles; it records the transactions, establishes the identity and establishes the contracts.

Hence Statement 3 is correct.

Q.49) Which of the following is/are the applications of Big data?

1. Better understanding and targeting customers by companies.
2. To prevent cyber-attacks, detect credit card fraud.
3. Used in healthcare to find new cures for cancer.
4. Security and law and order management.

Select the correct answer using the codes given below.

- a) 1 and 2 only
- b) 1, 2 and 4 only
- c) 1, 2 and 3 only
- d) 1, 2, 3 and 4

Q.49) Solution (d)

Q.50) Consider the following statements with respect to Dark Web:

1. Deep Web is the area of the Internet which is not accessible through search engines.
2. The dark web forms a small part of the deep web.

3. The dark web is the World Wide Web content that exists on darknets, overlay networks which use the public Internet but require specific software, configurations or authorization to access.

Which of the statements given above is/are correct?

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

Q.50) Solution (d)

Deep Web is the area of the Internet which is not accessible through search engines.

Hence Statement 1 is correct.

The dark web forms a small part of the deep web.

Hence Statement 2 is correct.

The dark web is the World Wide Web content that exists on darknets, overlay networks which use the public Internet but require specific software, configurations or authorization to access.

Hence Statement 3 is correct.

Q.51) Consider the following statements:

- 1. Institute of Nano Science & Technology (INST) is an autonomous institute of the Department of Science and Technology (DST).
- 2. INST has developed a nanotechnology-based industry-friendly and low-cost method for the production of antiepileptic drug 'Rufinamide'.

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.51) Solution (d)

Institute of Nano Science & Technology (INST) is an autonomous institute of the Department of Science and Technology (DST).

Hence Statement 1 is correct.

INST has developed a nanotechnology-based industry-friendly and low-cost method for the production of antiepileptic drug 'Rufinamide'.

Hence Statement 2 is correct.

Q.52) Consider the following statements regarding ICONSAT (International Conference on Nano Science and Technology):

- 1. ICONSAT is a biennial international conference.

2. ICONSAT is held under the aegis of International Association of Nanotechnology (IANT).

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.52) Solution (a)

ICONSAT is a biennial international conference. It provides provides a global platform of interactions among eminent scientists to bring to fore the recent advances in the area of nanoscience and technology.

Hence Statement 1 is correct.

ICONSAT is held under the aegis of Nano Mission, Department of Science and Technology, Government of India.

Hence Statement 2 is incorrect.

Q.53) Consider the following statements:

- 1. Nanotechnology is the development and use of techniques to study physical phenomena and develop new devices and material structures in the physical size range of 1-10 nanometres (nm).
- 2. 1 nanometre is equal to one millionth of a meter.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.53) Solution (d)

Nanotechnology is the development and use of techniques to study physical phenomena and develop new devices and material structures in the physical size range of 1-100 nanometres (nm).

Hence Statement 1 is incorrect.

1 nanometre is equal to one billionth of a meter.

Hence Statement 2 is incorrect.

Q.54) Consider the following statements Indian Nanoelectronics Users Programme (INUP):

- 1. Indian Nanoelectronics Users Programme (INUP) is an initiative by Ministry of Science and Technology.
- 2. INUP is being implemented at Centre of Excellence in Nanoelectronics (CEN) at IISc and IIT Bombay.

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2

- d) Neither 1 nor 2

Q.54) Solution (a)

Indian Nanoelectronics Users Programme (INUP) is an initiative by Ministry of Electronics and Information Technology (MeitY).

Hence Statement 1 is incorrect.

INUP is being implemented at Centre of Excellence in Nanoelectronics (CEN) at IISc and IIT Bombay.

Hence Statement 2 is correct.

Q.55) Which of the following organizations has developed a Nano-technology based disinfectant spray 'ANANYA'

- a) Council of Scientific and Industrial Research (CSIR).
- b) Institute of Nano Science & Technology (INST).
- c) Defence Institute of Advanced Technology (DIAT).
- d) Indian Institute of Science (IISc)

Q.56) Solution (c)

Defence Institute of Advanced Technology, a Deemed to be University, Pune has developed a Nano-technology based disinfectant spray to combat COVID-19 by disinfecting all types of surfaces.

Q.56) Environment nanotechnology involves use of nanoscale material for addressing environmental concerns. Consider the following statements.

1. NanoCO₂ harvester which can suck CO₂ from the atmosphere and convert it into methanol can be used as vehicular fuel.
2. The magnetically charged nanoparticles have been proved potent to remove heavy metals and dyes from the water bodies.
3. Due to nanoparticles' ability of long persistence, they may raise concerns such as bio-magnification.

Which of the above statements is/are correct?

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

Q.56) Solution (d)

NanoCO₂ harvester which can suck CO₂ from the atmosphere and convert it into methanol can be used as vehicular fuel.

Hence Statement 1 is correct.

The magnetically charged nanoparticles have been proved potent to remove heavy metals and dyes from the water bodies.

Hence Statement 2 is correct.

Due to nanoparticles' ability of long persistence, they may raise concerns such as bio-magnification.

Hence Statement 3 is correct.

Q.57) Consider the following statements about Carbon Nano Tubes.

1. Carbon nanotubes (CNTs) are an isotope of carbon.
2. Carbon Nanotubes are also known as Carbon fibers.
3. CNT metal matrix composites have excellent electrical properties and are used as reinforcement to metals in order to enhance their electrical properties.

Which of the above statements is/are correct?

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

Q.57) Solution (d)

Carbon nanotubes (CNTs) are an isotope of carbon.

Hence Statement 1 is correct.

Carbon Nanotubes are also known as Carbon fibers.

Hence Statement 2 is correct.

CNT metal matrix composites have excellent electrical properties and are used as reinforcement to metals in order to enhance their electrical properties.

Hence Statement 3 is correct.

Q.58) which of the following correctly defines BRABO:

- a) India's first industrial robot
- b) India's first nanotechnology based computer
- c) India's first solar technology park
- d) India's first operating system

Q.58) Solution (a)

Q.59) The most common water-based antifreeze solutions used in automobile engines are mixtures of:

- a) Ethylene and Water
- b) Propylene and Water
- c) Ethylene glycol and Water
- d) Ethanol and Water

Q.59) Solution (c)

The most common water-based antifreeze solutions used in electronics cooling are mixtures of water and either ethylene glycol (EGW) or propylene glycol (PGW). The use of ethylene glycol has a longer history, especially in the automotive industry.

Q.60) Process of endoscopy is used to see the internal organs. Which of the following phenomenon is responsible for working of endoscopy?

- a) Reflection

- b) Total Internal reflection
- c) Scattering
- d) Diffraction

Q.60) Solution (b)

An endoscope is a bit like a bendy telescope a physician can use for seeing inside one of the body's cavities. Unlike a telescope, which is a very rigid tube, the part of an endoscope that enters a person's body is relatively flexible.

The light travels through endoscope with the help of Total internal reflection

Q.61) Consider the following statements regarding

1. The SARS-CoV-2 virus, (which causes Covid-19) does not have a DNA, but an RNA molecule.
2. The reverse transcription process converts the RNA into the DNA molecule before the gene can be captured in the test.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 or 2

Q.61) Solution (c)

The SARS-CoV-2 virus, (which causes Covid-19) does not have a DNA, but an RNA molecule.

Hence statement 1 is correct.

The reverse transcription process (the RT in RT-PCR) converts the RNA into the DNA molecule before the gene can be captured in the test.

Hence statement 2 is correct.

TrueNat is a chip-based, battery-operated RT-PCR kit. Initially, it could only identify the E-gene in the SARS-CoV-2 virus. This is the gene that helps the virus build a spherical envelope around it.

Q.62) Consider the following statements regarding the Oxytocin Hormone

1. This plays a crucial role in the childbirth process.

2. This hormone is produced by the pituitary gland and secreted by the hypothalamus

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 or 2

Q.62) Solution (a)

Oxytocin hormone plays a crucial role in the childbirth process and also helps with male reproduction.

Hence only statement 1 is correct.

Oxytocin is a hormone produced by the hypothalamus and secreted by the pituitary gland.

Hence statement 2 is incorrect.

Q.63) Consider the following statements regarding the differences between Bacteria and the Viruses

- 1. Bacteria are single-celled, living organisms whereas Viruses are usually considered as between living and non-living things.
- 2. Bacteria does not need a host for reproduction whereas viruses replicate only inside the hosts (living cell)

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 or 2

Q.63) Solution (c)

The main difference between bacteria and virus is that bacteria are living cells, reproducing independently and viruses are nonliving particles (as most virologists consider), requiring a host cell for their replication.

Hence both the statements are correct.

Q.64) Consider the following statements regarding the mandate of Indian Council of Medical Research (ICMR)

1. It is the apex body in India for the formulation, coordination and promotion of biomedical research
2. It conducts, coordinates and implements medical research for the benefit of the Society
3. It translates medical innovations in to products/processes and introduce them in to the public health system.

Which of the statements given above is/are correct?

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

Q.64) Solution (b)

The mandate of the ICMR is

1. Apex body in India for formulation, coordination and promotion of biomedical research
2. Conduct, coordinate and implement medical research for the benefit of the Society
3. Translating medical innovations in to products/processes and introducing them in to the public health system

Hence all the statements are correct

Q.65) NITI Aayog's Health Index ranks the States and Union Territories based on 23 health-related indicators which include

1. Neonatal Mortality Rate
2. Under-Five Mortality Rate
3. Total Fertility Rate (TFR)

4. Full Immunisation Coverage
5. Proportion Of Low Birth Weight Among New-Borns

Which of the following best describes the above features?

- a) 1, 2 and 4 only
- b) 1, 2, 3 and 4 only
- c) 2 and 3 only
- d) 1, 2, 3, 4 and 5

Q.65) Solution (d)

The NITI Aayog's Health Index was recently released in its report titled 'Healthy States, Progressive India: Report on Rank of States and UTs'.

The Index ranks the States and Union Territories based on 23 health-related indicators which include –

1. Neonatal mortality rate
2. Under-five mortality rate
3. Proportion of low birth weight among new-borns
4. Progress in treating tuberculosis and HIV
5. Full immunisation coverage
6. Improvements to administrative capability and public health infrastructure
7. Proportion of districts with functional cardiac care units
8. Proportion of specialist positions vacant at district hospitals

Hence all the statements are correct.

Q.66) India along with other countries in the South East Asian Region have signed World Health Organisation's (WHO) Call To end Tuberculosis (TB) by 2030 in the region. Which of the following statements is/are correct about TB?

1. It is bacterial disease which generally affects the lungs but can also affect other parts of the body.
2. It is a communicable disease which generally spreads only through physical contact with the infected person.
3. If the TB strain shows resistance to first line drugs, it is called Multiple Drug Resistant TB (MDR TB).

Select the correct answer using the code given below:

- a) 1 and 2

- b) 2 and 3
- c) 1 and 3
- d) All of the above

Q.66) Solution (c)

It is bacterial disease which generally affects the lungs but can also affect other parts of the body.

Hence statement 1 is correct

The bacteria generally spreads through the air from one person to another.

Hence statement 2 is incorrect

If the TB strain shows resistance to first line drugs, it is called Multiple Drug Resistant TB (MDR TB).

Hence statement 3 is correct

Q.67) With reference to Photodynamic Therapy, consider the following statements:

1. It uses a photosensitive drug that becomes active under the action of light.
2. It is used in treatment of cancer.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

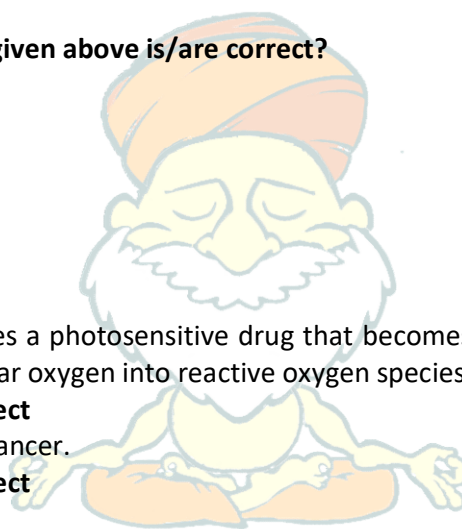
Q.67) Solution (c)

Photodynamic therapy uses a photosensitive drug that becomes active under the action of light and converts molecular oxygen into reactive oxygen species.

Hence statement 1 is correct

It is used in treatment of cancer.

Hence statement 2 is correct



Q.68) Generic Drugs have gain lot of attention in recent times due to Indo-US spate over IPR and Drug regime. Consider the following statements, to gain FDA approval, a generic drug must:

1. Contain the same active ingredients as the innovator drug
2. Be identical in strength, dosage form, and route of administration
3. Be bioequivalent
4. Meet the same batch requirements for identity, strength, purity, and quality

Select the correct answer using the code given below:

- a) 1, 2 and 3
- b) 2 and 4
- c) 1, 3 and 4
- d) 1, 2, 3 and 4

Q.68) Solution (d)

To gain FDA approval, a generic drug must:

1. contain the same active ingredients as the innovator drug (inactive ingredients may vary)
2. be identical in strength, dosage form, and route of administration
3. have the same use indications
4. be bioequivalent
5. meet the same batch requirements for identity, strength, purity, and quality
6. be manufactured under the same strict standards of FDA's good manufacturing practice regulations required for innovator products

Q.69) Consider the following statements regarding 'National Pharmaceutical Pricing Authority':

1. NPPA is nodal government regulatory agency that controls the prices of pharmaceutical drugs in India.
2. It comes under the aegis of Ministry of Health and family welfare.
3. NPPA decides the ceiling prices of essential medicines under The Drug (Prices Control) Order 2013.

Which of the above statements is/are correct?

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) All of the above

Q.69) Solution (c)

NPPA is nodal government regulatory agency that controls the prices of pharmaceutical drugs in India.

Hence statement 1 is correct

It functions under the aegis of Union Ministry of Chemicals and Fertilisers.

Hence statement 2 is incorrect

NPPA decides the ceiling prices of essential medicines under The Drug (Prices Control) Order 2013.

Hence statement 3 is correct

Q.70) Hepatitis is the medical term for inflammation of the liver. Consider the following regarding this

1. There are five types of viruses responsible for Hepatitis
2. Intake of toxic substances, alcohol and certain drugs are some of the causes of Hepatitis
3. Hepatitis B is transmitted through exposure to infective blood, semen, and other body fluids.

Which of the above statements is/are correct?

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) 1, 2 and 3

Q.70) Solution (d)

There are five types of viruses responsible for Hepatitis

Hence Statement 1 is correct.

Intake of toxic substances, alcohol and certain drugs are some of the causes of Hepatitis

Hence Statement 2 is correct.

Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic disease.

The virus is most commonly transmitted from mother to child during birth and delivery, as well as through contact with blood or other body fluids.

Hepatitis B is transmitted through exposure to infective blood, semen, and other body fluids.

Hence Statement 3 is correct.

Q.71) Consider the following statements:

1. When the light is reflected from a surface, the angle of incidence is generally equal to the angle of reflection.
2. laws of reflection are applicable to all types of reflecting surfaces except spherical surfaces.

Which of the statements given above is/are NOT CORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.71) Solution (b)

When the light is reflected from a surface, the angle of incidence is generally equal to the angle of reflection.

Hence Statement 1 is correct.

laws of reflection are applicable to all types of reflecting surfaces including spherical surfaces.

Hence Statement 2 is incorrect.

Q.72) Consider the following statements regarding formation of image by a plane mirror:

1. Image formed by a plane mirror is always virtual and erect.
2. The image formed is as far behind the mirror as the object is in front of it.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.72) Solution (c)

Image formed by a plane mirror is always virtual and erect. The size of the image is equal to that of the object.

Hence Statement 1 is correct.

The image formed is as far behind the mirror as the object is in front of it. Further, the image is laterally inverted.

Hence Statement 2 is correct.

Q.73) Consider the following statements:

1. Conventionally, in an electric circuit the direction of electric current is taken as the same direction of the flow of electrons.
2. Electric current is expressed by the amount of charge flowing through a particular area in unit time.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.73) Solution (b)

Conventionally, in an electric circuit the direction of electric current is taken as opposite to the direction of the flow of electrons, which are negative charges.

Hence Statement 1 is incorrect.

Electric current is expressed by the amount of charge flowing through a particular area in unit time.

Hence Statement 2 is correct.

Q.74) Consider the following statements:

1. The electrons are able to travel through a perfect solid crystal smoothly.
2. The motion of electrons in a conductor is very different from that of charges in empty space.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.74) Solution (c)

Electrons are able to 'travel' through a perfect solid crystal smoothly and easily, almost as if they were in a vacuum.

Hence Statement 1 is correct.

The motion of electrons in a conductor, however, is very different from that of charges in empty space.

Hence Statement 2 is correct.

Q.75) Consider the following statements:

1. Magnetic field is a quantity that has direction but not magnitude.
2. The relative strength of the magnetic field is shown by the degree of closeness of the field lines.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.75) Solution (b)

Magnetic field is a quantity that has both direction and magnitude.

Hence Statement 1 is incorrect.

The relative strength of the magnetic field is shown by the degree of closeness of the field lines.

No two field lines are found to cross each other.

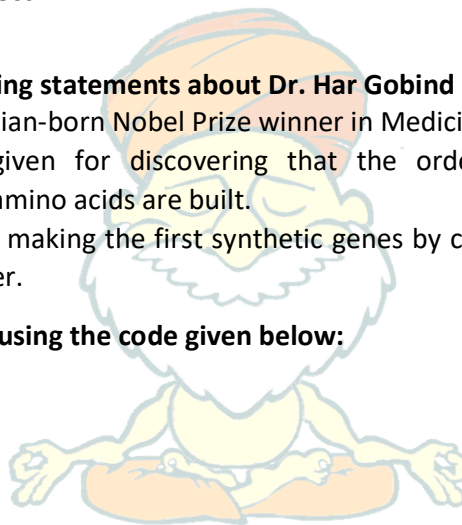
Hence Statement 2 is correct.

Q.76) Which of the following statements about Dr. Har Gobind Khorana is/are correct?

1. He was the first Indian-born Nobel Prize winner in Medicine
2. The award was given for discovering that the order of nucleotides in DNA determines which amino acids are built.
3. He is credited with making the first synthetic genes by cutting and pasting different bits of DNA together.

Select the correct answer using the code given below:

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



Q.76) Solution (b)

Har Gobind Khorana was an Indian American biochemist who shared the 1968 Nobel Prize for Physiology or Medicine with Marshall W. Nirenberg and Robert W. Holley

Hence statement 1 incorrect

The award was given for discovering that the order of nucleotides in DNA determines which amino acids are built.

Hence statement 2 correct

He is credited with making the first synthetic genes by cutting and pasting different bits of DNA together.

Hence statement 3 correct

Q.77) Millimeter waves are broadcast at frequencies between:

- a) 10 to 100 gigahertz
- b) 20 to 200 gigahertz
- c) 30 to 300 gigahertz
- d) 40 to 400 gigahertz

Q.77) Solution (c)

Millimeter wave (also millimeter band) is the band of spectrum between 30 gigahertz (Ghz) and 300 Ghz. Researchers are testing 5G wireless broadband technology on millimeter wave spectrum.

Q.78) C. V. Raman, was the first Indian Scientist to receive a Nobel Price. He published his theory on the Raman Effect in 1928. Raman Effect is associated with which of the following?

- a) Scattering of light
- b) Total internal reflection
- c) Atomic structure
- d) Semi-conductors

Q.78) Solution (a)

Raman Effect, change in the wavelength of light that occurs when a light beam is deflected by molecules.

When a beam of light traverses a dust-free, transparent sample of a chemical compound, a small fraction of the light emerges in directions other than that of the incident (incoming) beam. Most of this scattered light is of unchanged wavelength. A small part, however, has wavelengths different from that of the incident light; its presence is a result of the Raman Effect.

Q.79) Consider the following statements regarding microwave ovens:

1. Instead of generating heat that warms the food from outside, the microwaves penetrate food and create the heat within.
2. Microwaves are electromagnetic waves that are created by a component called 'Megatron' in the oven.
3. Microwaves are known to destroy the nutrients in the food.

Which of the above statements is/are correct?

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) All of the above

Q.79) Solution (a)

The key component of a microwave oven is the magnetron. Although the name conjures up hardware from a questionable science-fiction movie, the sophisticated vacuum tube generates microwaves powerful enough for military radars (for which it was originally developed). Instead of a flame or electric coil generating heat that warms food from the outside, the microwaves penetrate food and create heat from within.

Microwaves generally do not destroy the nutrients in the food.

Q.80) Consider the following statements with respect to Dispersion of light:

1. The sequence VIBGYOR is in the order of increasing frequency.
2. The red light used in the traffic light is visible even in dense fog, because it has lowest frequency in the VIBGYOR colour spectrum.

Which of the above statements is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.80) Solution (b)

The sequence VIBGYOR is in the order of decreasing frequency or increasing wave length.

Hence statement 1 is incorrect

The light which has lowest frequency (Red) will bend slightly whereas light which has more frequency will bend more (Violet)

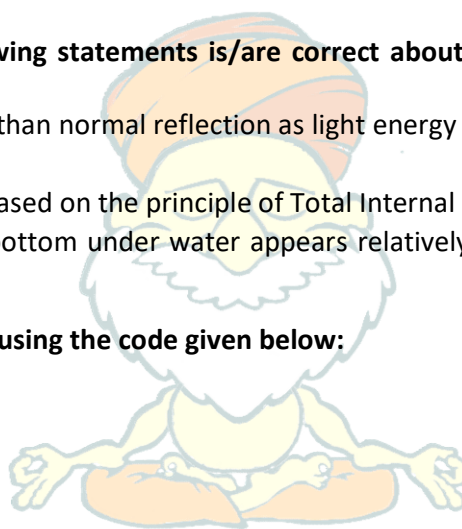
Hence statement 2 is correct

Q.81) Which of the following statements is/are correct about the phenomenon of Total Internal Reflection (TIR)?

1. It is more efficient than normal reflection as light energy is not wasted by absorption at the interface.
2. Optical fibers are based on the principle of Total Internal Reflection.
3. The depth of the bottom under water appears relatively shallow than it actually is, because of TIR.

Select the correct answer using the code given below:

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) All of the above



Q.81) Solution (a)

It is more efficient than normal reflection as light energy is not wasted by absorption at the interface.

Hence statement 1 is correct.

Optical fibers are based on the principle of Total Internal Reflection.

Hence statement 2 is correct.

The depth of the bottom under water appears relatively shallow than it actually is, because of refraction.

Hence statement 3 is incorrect

When light goes from a denser medium to a less dense medium, as the angle of incidence exceeds the critical angle, the ray reflects back to the denser medium. This phenomenon is called Total Internal Reflection.

Total Internal Reflection is a very efficient reflection, as the loss of light energy is almost negligible.

Q.82) Consider the following statements:

1. The loudness of sound depends on its amplitude and the frequency determines the pitch of a sound.
2. Sounds of frequencies less than about 20,000 vibrations per second cannot be detected by the human ear

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.82) Solution (a)

The loudness of sound depends on its amplitude and the frequency determines the pitch of a sound.

Hence statement 1 correct

The range of audible frequencies for a human ear is roughly from 20 to 20,000 vibrations per second (20 to 20,000 Hz).

Hence statement 2 incorrect

Q.82) Consider the following:

1. Total Internal Reflection
2. Refraction
3. Dispersion

Which of the above mentioned phenomena plays a role in the formation of Rainbow?

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

Q.82) Solution (d)

A rainbow is a meteorological phenomenon that is caused by Total Internal Reflection, Refraction and Dispersion of light in water droplets resulting in a spectrum of light appearing in the sky.

Q.83) Which of the following statements is/are correct regarding diffused reflection?

1. When all the parallel rays reflected from a plane surface are not parallel, the reflection is known as diffused reflection.
2. The diffused reflection is due to the failure of the laws of reflection.

3. The diffused reflection is caused by the irregularities in the reflecting surface.

Which of the statements given above is/are correct?

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) None of the above

Q.83) Solution (c)

When all the parallel rays reflected from a plane surface are not parallel, the reflection is known as diffused or irregular reflection.

Hence statement 1 is correct

The diffused **reflection is not due to** the failure of the laws of reflection. It is caused by the irregularities in the reflecting surface

Hence statement 2 is incorrect

The diffused reflection is caused by the irregularities in the reflecting surface, like that of a cardboard.

Hence statement 3 is correct

Q.84) Consider the following statements:

- 1. The image formed by a concave mirror will be always larger in size than the object.
- 2. Convex mirrors can form images of objects spread over a large area.
- 3. The image formed by convex mirror may be real or virtual.

Which of the statements given above is/are correct?

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

Q.84) Solution (c)

The image formed by a concave mirror can be smaller or larger in size than the object.

Concave mirrors are commonly used in torches, search-lights and vehicles headlights to get powerful parallel beams of light.

Hence statement 1 is incorrect

Convex mirrors can form images of objects spread over a large area. So, these help the drivers to see the traffic behind them.

Hence statement 2 is correct

The image formed by a concave mirror may be real or virtual.

Hence statement 3 is incorrect

Q.85) Which of the following statements is/are correct regarding Nobel Prize?

1. The Nobel Prize in Physics is awarded by The Royal Swedish Academy of Sciences, Stockholm, Sweden.
2. One can nominate himself or herself to be eligible for the Physics Prize.
3. The statutes of the Nobel Foundation restrict disclosure of information about the nominations, whether publicly or privately, for 50 years.

Select the correct answer using the code given below:

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

Q.85) Solution (b)

The Nobel Prize in Physics is awarded by The Royal Swedish Academy of Sciences, Stockholm, Sweden.

Hence statement 1 is correct

The candidates eligible for the Physics Prize are those nominated by qualified persons who have received an invitation from the Nobel Committee to submit names for consideration. No one can nominate himself or herself.

Hence statement 2 is incorrect

The statutes of the Nobel Foundation restrict disclosure of information about the nominations, whether publicly or privately, for 50 years.

Hence statement 3 is correct

Q.86) Which of the following are illustrations of total internal reflection?

1. Shining of air bubble in water
2. Sparkling of diamond
3. Increase in duration of sun's visibility
4. Mirage and looming
5. Ophthalmoscope

Choose the appropriate code:

- a) 1, 2, 3 and 4 only

- b) 1, 2 and 5 only
- c) 1, 2, 3 and 5 only
- d) All of the above

Q.86) Solution (d)

Total Internal Reflection:

If light is propagating from denser medium towards the rarer medium and angle of incidence is more than critical angle, then the light incident on the boundary is reflected back in the denser medium, obeying the laws of reflection. This phenomenon is called total internal reflection as total light energy is reflected, no part is absorbed or transmitted.

For total internal reflection,

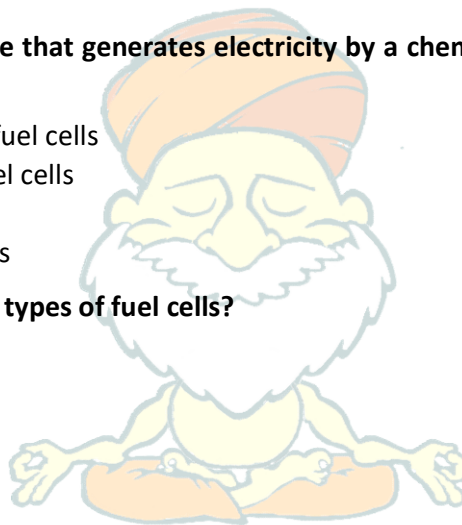
- 1) Light must be propagating from denser to rarer medium
- 2) Angle of incidence must exceed the critical angle

Q.87) A fuel cell is a device that generates electricity by a chemical reaction. Consider the following

- 1. Molten carbonate fuel cells
- 2. Phosphoric Acid fuel cells
- 3. Hydrogen fuel cells
- 4. Solid oxide fuel cells

Which of the above is/are types of fuel cells?

- a) Only 3
- b) 2 and 3
- c) 2, 3 and 4
- d) 1, 2, 3 and 4

**Q.87) Solution (d)**

Similar to batteries and all other electrochemical cells, fuel cells have two electrodes, and an electrolyte sandwiched in between. Fuel cells are distinguished by the type of electrolyte they use. The more common fuel cells on the market are:

PEM "Polymer Exchange Membrane" also known as "Polymer Electrolyte Membrane" Fuel Cell (PEMFC)

"Solid Oxide" Fuel cell (SOFC),

"Molten Carbonate" Fuel cell (MCFC),

Q.88) Which of the following forces are not the example of contact forces?

- 1. Friction force
- 2. Electrostatic force
- 3. Magnetic force

4. Gravitational force
5. Air resistance force

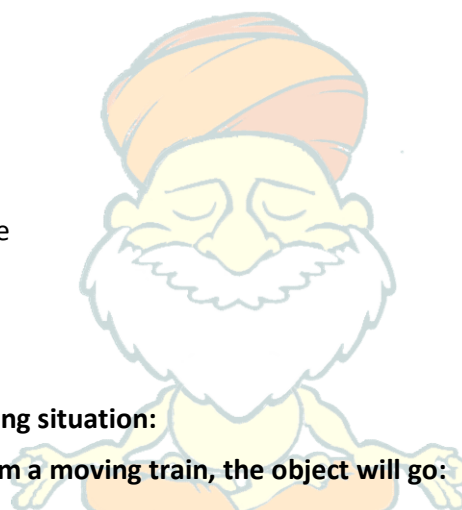
Select the code from the following:

- a) 1 only
- b) 1, 3, 4 and 5
- c) 2, 3 and 4
- d) 2, 4 and 5

Q.88) Solution (c)

Friction force is an example of a contact force. Rest of the three forces acts from a distance and don't require body to body contact.

- Contact Forces
- Action-at-a-Distance Forces
- Frictional Force
- Gravitational Force
- Tension Force
- Electrical Force
- Normal Force
- Magnetic Force
- Air Resistance Force
- Applied Force
- Spring Force



Q.89) Consider the following situation:

If an object is released from a moving train, the object will go:

- a) In the opposite direction of the moving train.
- b) In the same direction of the moving train.
- c) It will fall straight downwards.
- d) None of the above

Q.89) Solution (b)

The object will be in inertia of motion. As it was moving with train, it had a component of velocity in the direction of motion. If it is released, that component will still be there and it will fall in the direction of motion of the train.

Q.90) Steam burns are more severe than the burns caused by boiling water because:

- a) The temperature of steam is higher than the boiling water.
- b) Steam contains more heat in the form of latent heat.
- c) Steam hits the body with a pressure while water does not.
- d) The given statement is false.

Q.90) Solution (b)

Steam burns are more severe as steam contains more heat in the form of latent heat.

Q.91) Consider the following statements:

1. Plastics which when moulded once cannot be softened by heating are called thermoplastics.
2. The uniforms of firemen have coating of melamine plastic to make them flame resistant.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.91) Solution (b)

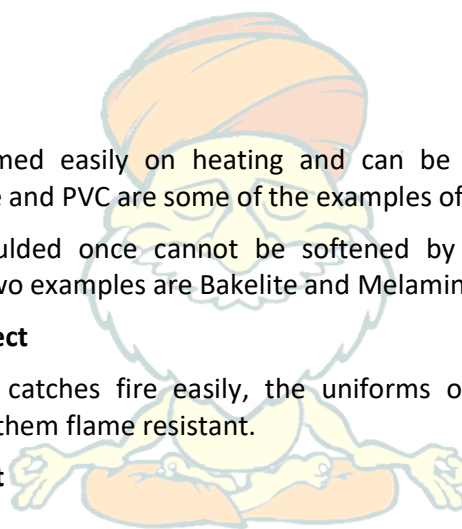
Plastic which gets deformed easily on heating and can be bent easily are known as **Thermoplastics**. Polythene and PVC are some of the examples of Thermoplastics.

Plastics which when moulded once cannot be softened by heating. These are called **Thermosetting Plastics**. Two examples are Bakelite and Melamine.

Hence statement 1 incorrect

Although Synthetic Fibre catches fire easily, the uniforms of firemen have coating of melamine plastic to make them flame resistant.

Hence statement 2 correct

**Q.92) Consider the following statements:**

1. Mercury is the only metal which is found in liquid state at room temperature.
2. Sulphur is stored in kerosene as it is a very highly reactive metal.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.92) Solution (a)

Mercury is the only metal which is found in liquid state at room temperature.

Hence statement 1 is correct

Sodium is stored in kerosene as it is a very highly reactive metal. If it is kept in open air, it easily reacts with the oxygen and catches fire. Since kerosene is a mixture of hydrocarbons, it won't react with it.

Hence statement 2 is incorrect

Q.93) Consider the following statements:

1. Burning of coal and diesel releases sulphur dioxide gas
2. Petrol engines give off gaseous oxides of nitrogen
3. Burning coal in a closed room releases carbon monoxide gas, which can kill persons sleeping in that room.

Which of the statements given above is/are correct?

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) 1, 2 and 3

Q.93) Solution (d)

Burning of coal and diesel releases sulphur dioxide gas

Hence statement 1 is correct

Petrol engines give off gaseous oxides of nitrogen

Hence statement 2 is correct

Burning coal in a closed room releases carbon monoxide gas, which can kill persons sleeping in that room.

Hence statement 3 is correct

Q.94) Consider the following pairs:

Name of the acid/base	Found in
1. Lactic Acid	Curd
2. Oxalic Acid	Ant's sting
3. Sodium hydroxide	Soap
4. Potassium hydroxide	Sanitizers

Which of the pairs given above is/are correctly matched?

- a) 1, 3 and 4 only
- b) 1 and 3 only
- c) 2 and 4 only

- d) 1, 2, 3 and 4

Q.94) Solution (a)

Name of the acid/base	Found in
1. Lactic Acid	Curd
2. Oxalic Acid	Spinach
3. Sodium hydroxide	Soap
4. Potassium hydroxide	Sanitizers

Ant's sting has Formic Acid.

Q.95) Which of the following Polymer is used in making parachutes?

- a) Nylon
- b) Terylene
- c) Rayon
- d) None of the Above

Q.95) Solution (a)

Nylon is used for making parachutes and ropes for rock climbing. A nylon thread is actually stronger than a steel wire.

Hence Option a is correct

Q.96) Which of the following reactions are irreversible chemical changes:

- 1. Rusting of Iron
- 2. Cooking of food
- 3. Fermentation of grapes
- 4. Formation of ozone

Select the correct code from the following:

- a) 1,2 and 3
- b) 2,3 and 4
- c) 1,3 and 4
- d) 1,2,3 and 4

Q.96) Solution (a)

Formation of Ozone is a reversible process. Once an ozone molecule is formed, it breaks again into oxygen gas(O_2) and Oxygen molecule(O).

Q.97) Which of the following processes are exothermic i.e. they release energy?

1. Burning of coal
2. Respiration
3. Decomposition of vegetables to form compost

Select the code from the following:

- a) 1 and 2
- b) 2 and 3
- c) 1 and 3
- d) All of the above

Q.97) Solution (d)

In the process of respiration, the food we eat reacts with the oxygen we breathe and releases energy. Note: all the three examples are taken from class X NCERT.

Q.98) If someone is suffering from the problem of acidity. What is the ideal thing he should take to have relief?

- a) Lemon juice
- b) Vinegar
- c) Baking soda solution
- d) Aerated soft drink

Q.98) Solution (c)

Baking soda solution is a basic solution which helps in neutralising the acidity. Other three are acidic which will aggravate the problem.

Q.99) Consider the following statements:

1. Distilled water does not conduct electricity.
2. The pH of distilled water is seven.

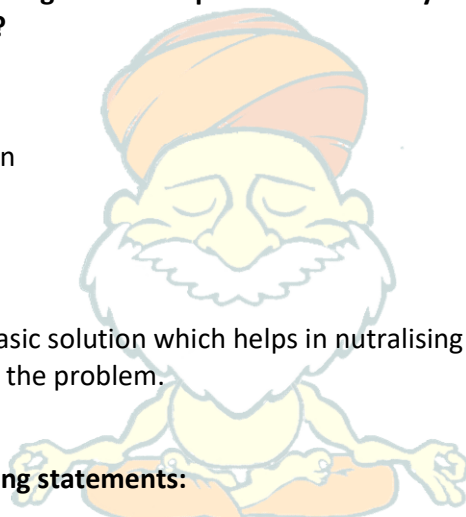
Which of the above statements are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.99) solution (c)

Distilled water is pure water and does not contain any salt ions. Pure water is a bad conductor of electricity.

Distilled water is neither acidic nor basic. The pH value is 7.



Q.100) Copper was the first metal to be used by mankind on a large scale. What was the correct reason behind that?

- a) Copper is less reactive and can be easily extracted from its ore.
- b) Copper was the most abundant metal of the world.
- c) Copper had higher conductivity than iron or aluminum.
- d) Copper had religious significance.

Q.100) Solution (a)

Copper was accidentally discovered by man. It was extensively used as it was easy to extract it from its ore. (Just by heating)

Q.101) Consider the following statements:

- 1. The organisms having nuclear material without nuclear membrane are called as eukaryotic cells.
- 2. All organisms other than bacteria and blue green algae are called eukaryotes.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.101) Solution (b)

The organisms **having well organized nucleus with a nuclear membrane** are called as eukaryotic cells.

Hence statement 1 incorrect

All organisms other than bacteria and blue green algae are called eukaryotes.

Hence statement 2 correct

Q.102) Consider the following statements:

- 1. The hormone thyroxin helps the body to adjust to stress when one is very angry, embarrassed or worried.
- 2. Pituitary gland is an endocrine gland which is attached to the brain.
- 3. Pituitary secretes growth hormone which is necessary for the normal growth of a person.

Which of the statements given above is/are correct?

- a) 1 only

- b) 2 and 3 only
- c) 1 and 3 only
- d) 1, 2 and 3

Q.102) Solution (b)

The hormone **adrenalin** helps the body to adjust to stress when one is very angry, embarrassed or worried.

Hence statement 1 is incorrect

Pituitary gland is an endocrine gland which is attached to the brain.

Hence statement 2 is correct

Pituitary secretes growth hormone which is necessary for the normal growth of a person.

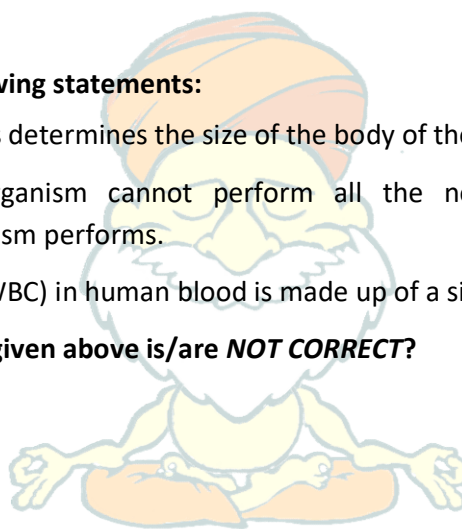
Hence statement 3 is correct

Q.103) Consider the following statements:

1. The size of the cells determines the size of the body of the animal or plant.
2. A single-celled organism cannot perform all the necessary functions that a multicellular organism performs.
3. White blood cell (WBC) in human blood is made up of a single cell.

Which of the statements given above is/are NOT CORRECT?

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

**Q.103) Solution (a)**

The size of the cells **has no relation with the size of the body of the animal or plant**. The size of the cell is related to its function.

Hence statement 1 is incorrect

A single-celled **organism performs all the necessary functions that** multicellular organisms perform.

Hence statement 2 is incorrect

White blood cell (WBC) in human blood is made up of a single cell.

Hence statement 3 is correct

Q.104) Consider the following statements:

1. The plasma membrane is the outermost covering of the cell
2. The plasma membrane is a selectively permeable membrane.
3. The plasma membrane is made up of organic molecules called lipids and proteins.

Which of the statements given above is/are correct?

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

Q.104) Solution (d)

The plasma membrane is the outermost covering of the cell that separates the contents of the cell from its external environment.

Hence statement 1 is correct

The plasma membrane is called a selectively permeable membrane.

Hence statement 2 is correct

The plasma membrane is flexible and is made up of organic molecules called lipids and proteins.

Hence statement 3 is correct

Q.105) Consider the following statements:

1. Lysosomes help to keep the cell clean by digesting any foreign material
2. Plastids are present both in plant and animal cells.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.105) Solution (a)

Lysosomes help to keep the cell clean by digesting any foreign material as well as worn-out cell organelles.

Hence statement 1 is correct

Plastids are **present only in plant cells**.

Hence statement 2 is incorrect

Q.106) Consider the following statements regarding Meristematic Tissues

1. Meristematic tissues are located only in specific regions.
2. New cells produced by meristem are initially like those of meristem itself.
3. Cells of meristematic tissue differentiate to form different types of permanent tissue.

Which of the above statement(s) is/are *INCORRECT*?

- a) 1, 2 and 3
- b) Only 1
- c) 2 and 3
- d) None of the above

Q.106) Solution (d)

Meristematic tissues are located only in specific regions.

Hence statement 1 is correct

New cells produced by meristem are initially like those of meristem itself, but as they grow and mature, their characteristics slowly change and they become differentiated as components of other tissues.

Hence statement 2 is correct

Cells of meristematic tissue differentiate to form different types of permanent tissue.

Hence statement 3 is correct

Q.107) Which among the following is/are diseases caused by Protozoa?

1. Malaria
2. Diarrhea
3. Kala-azar
4. Sleeping sickness

Choose the appropriate code:

- a) 4 only
- b) 1 and 3 only
- c) 1, 2 and 4 only
- d) All of the above

Q.107) Solution (d)

All the given diseases are caused by Protozoa

Protozoan infections are parasitic diseases caused by organisms formerly classified in the Kingdom Protozoa.

Protozoa are single-celled micro-organisms that get their food from the surrounding environment or as scientists would say 'they are heterotrophs'. They can be found in a variety of habitats such as freshwater (including ponds & rivers), marine (the sea) and even in the soil.

Q.108) Match List I with List II and select the correct answer using the code given below the Lists:

List I	List II
A. Vitamin A	1.Non-clotting of blood
B. Vitamin B	2.Rickets
C. Vitamin C	3.Beriberi
D. Vitamin D	4.Night Blindness
E. Vitamin K	5.Scurvy

A-B-C-D-E

- a) 4-3-5-2-1
- b) 4-1-5-2-3
- c) 4-1-5-3-2
- d) 2-1-5-4-3

Q.108) Solution (a)

- | | |
|--------------|-------------------------|
| A. Vitamin A | 1. Night Blindness |
| B. Vitamin B | 2. Beriberi |
| C. Vitamin C | 3.Scurvy |
| D. Vitamin D | 4. Rickets |
| E. Vitamin K | 5.Non-clotting of blood |

Q.109) Consider the following statements:

1. When we breathe in, our diaphragm contracts.
2. When we focus at a far object, our pupils dilate.

Which of the above statement(s) is/are INCORRECT?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.109) Solution (d)

Both the statements are correct.

When you breathe in, or inhale, your diaphragm contracts (tightens) and moves downward. This increases the space in your chest cavity, into which your lungs expand.

Rays of light from a far away object are almost perfectly parallel and by the time they reach your eye, these rays are quite weak, so the pupils dilate to let as much light in from the object as possible.

Q.110) Food cans are coated with tin and not with zinc because:

- a) Zinc is costlier than tin.
- b) Zinc has a higher melting point than tin.
- c) Zinc is more reactive than tin.
- d) Zinc is less reactive than tin.

Q.110) Solution (c)

Zinc can react with food items especially acidic things like vinegar, lemon juice etc. and can contaminate the food.

Q.111) Consider the following statements:

- 1. Collenchyma tissue provides mechanical support to plants.
- 2. The husk of a coconut is made up of Collenchyma tissue.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.111) Solution (a)

Collenchyma tissue provides mechanical support to plants.

Hence statement 1 is correct

Sclerenchyma tissue makes the plant hard and stiff. The husk of a coconut is made up of **sclerenchymatous tissue**.

Hence statement 2 is incorrect

Q.112) Which of the following is/are the connective tissue in animals?

- 1. Bone
- 2. Blood
- 3. Areolar
- 4. Cartilage

Select the correct answer using the code given below:

- a) 1 and 4 only

- b) 1 only
- c) 1, 3 and 4 only
- d) 1, 2, 3 and 4

Q.112) Solution (d)

The different types of connective tissues in our body include areolar tissue, adipose tissue, bone, tendon, ligament, cartilage and blood.

Q.113) Consider the following:

1. Contraction and relaxation of heart
2. Movement of limbs
3. Movement of food in the alimentary canal
4. Contraction and relaxation of blood vessels

Which of the above is/are involuntary movements?

- a) 2 and 3 only
- b) 1 and 4 only
- c) 1, 3 and 4 only
- d) 1, 2, 3 and 4

Q.113) Solution (c)

Contraction and relaxation of heart, Movement of food in the alimentary canal, Contraction and relaxation of blood vessels are involuntary movements.

Movement of limbs is voluntary movement.

**Q.114) Consider the following statements:**

1. The plants of Angiosperms bear naked seeds and are usually perennial, evergreen and woody.
2. Gymnosperms are called as flowering plants.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.114) Solution (d)

The plants of **Gymnosperms** bear **naked** seeds and are usually perennial, evergreen and woody.

Hence statement 1 is incorrect

Angiosperms are called as flowering plants. In Angiosperms the seeds develop inside an organ which is modified to become a fruit.

Hence statement 2 is incorrect

Q.115) Consider the following statements:

1. Most Reptiles are cold-blooded animals with either three or four chambered heart.
2. Most Aves and Mammals are warm-blooded animals with four-chambered heart.

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

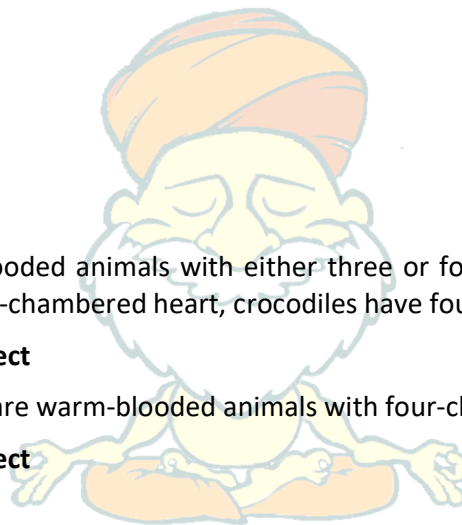
Q.115) Solution (c)

Most Reptiles are cold-blooded animals with either three or four chambered heart. While most of them have a three-chambered heart, crocodiles have four heart chambers.

Hence statement 1 is correct

Most Aves and Mammals are warm-blooded animals with four-chambered heart.

Hence statement 2 is correct



Q.116) Which among the following statements is/are true in regard to DNA and RNA?

1. Sugar is deoxyribose type in DNA, whereas sugar is just ribose type in RNA
2. DNA is double stranded structure, whereas RNA is single stranded structure

Which of the statements given above is/are correct?

- a) 1 only
- b) 2 only
- c) Both 1 and 2
- d) Neither 1 nor 2

Q.116) Solution (c)

Sugar is deoxyribose type in DNA, whereas sugar is just ribose type in RNA

Hence Statement 1 is correct.

DNA is double stranded structure, whereas RNA is single stranded structure

Hence Statement 2 is correct.

Q.117) Identify the correct statement regarding Chromosomes

- a) It contains DNA, RNA and protein
- b) It contains RNA and protein
- c) It contains DNA and protein
- d) It contains only DNA

Q.117) Solution (c)

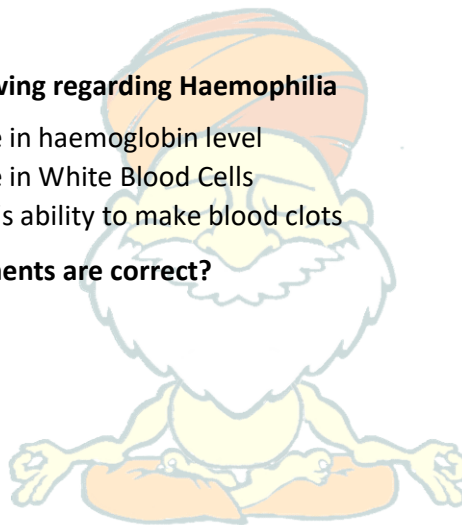
Chromosomes are thread-like structures located inside the nucleus of animal and plant cells. Each chromosome is made of protein and a single molecule of deoxyribonucleic acid (DNA). Passed from parents to offspring, DNA contains the specific instructions that make each type of living creature unique.

Q.118) Consider the following regarding Haemophilia

- 1. It leads to decrease in haemoglobin level
- 2. It leads to decrease in White Blood Cells
- 3. It impairs the body's ability to make blood clots

Which of the given statements are correct?

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



Q.118) Solution (b)

Haemophilia, also spelled hemophilia, is a mostly inherited genetic disorder that impairs the body's ability to make blood clots, a process needed to stop bleeding. This occurs due to low levels of clotting factor.

This results in people bleeding longer after an injury, easy bruising, and an increased risk of bleeding inside joints or the brain

Q.119) Which among the following are general features of most of the Mammals?

- 1. Sweat glands and oil glands are found on skin
- 2. They are Vertebrates.
- 3. There is no nucleus in its blood cells

Choose the correct code

- a) 1 and 2 only

- b) 2 and 3 only
- c) 1 only
- d) 1,2 and 3

Q.119) Solution (d)**Mammal Characteristics**

- All mammals are warm blooded.
- Most young are born alive.
- They have hair or fur on their bodies.
- Every mammal is a vertebrate.
- All mammals have lungs to breathe air.
- Its hearts are divided into four chambers.
- Mammals feed milk to their babies.
- There is no nucleus in its blood cells (except in camel and lama).
- External ear is present in mammal.

Q.120) Consider the following statements:

1. Apart from blood groups – O, A, B and AB, there is a special type of blood group (hh)
2. 'A' type blood can accept blood from 'A' type or 'O' type and not from 'AB' or 'B' type donors
3. The main reason behind the difference in blood of human is the glyco protein which is found in RBC called antigen

Which of the statements given above is/are correct?

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

Q.120) Solution (d)

Apart from blood groups – O, A, B and AB, there is a special type of blood group (hh)

(hh)- a rare special blood group first discovered in Bombay in 1952, and hence christened as Bombay Blood.

People who carry this rare blood type, about 1 in 10, 000 Indians, can accept blood only from another Bombay Blood type individual, and not from anyone who is O, A, B or AB type.