

**Q.1) The term “quantum supremacy” is associated with:**

- a) Astronomical phenomenon
- b) A Quantum powered satellite.
- c) Quantum Computing
- d) None of the above

**Q.1) Solution (c)**

**Basic Information:**

- Quantum supremacy is the ability to use a quantum computer to perform a single calculation that no conventional computer, even the biggest supercomputer, can perform in reasonable amount of time.
- Google researchers claim to have achieved a major milestone in computer science known as “quantum supremacy.”
- The Google research involved checking whether the output of an algorithm for generating random numbers was truly random. The researchers were able to use a quantum computer to perform this complex mathematical calculation in three minutes and 20 seconds, according to the paper.
- It is claimed that it would have taken Summit 3—an IBM-built machine that is the world’s most powerful commercially-available conventional computer—about 10,000 years to perform the same task.

**Q.2) What may happen if a black hole of the same mass as the sun were to take the place of the sun?**

- a) The Earth and other planets will be destroyed.
- b) Earth and the other planets would orbit the black hole as they orbit the sun now.
- c) Only the Jovian planets will orbit the black hole and others will collapse into the black hole.
- d) None of the above.

**Q.2) Solution (b)**

**Basic Information:**

A black hole is a place in space where gravity pulls so much that even light cannot get out. The gravity is so strong because matter has been squeezed into a tiny space. This can happen when a star is dying.

**Could a Black Hole Destroy Earth?**

- Even if a black hole the same mass as the sun were to take the place of the sun, Earth still would not fall in. The black hole would have the same gravity as the sun.
- Earth and the other planets would orbit the black hole as they orbit the sun now.
- The sun will never turn into a black hole. The sun is not a big enough star to make a black hole.

**Q.3) Which of the following physical quantities is/are part of vector quantities?**

1. Impulse
2. Power
3. Change in temperature
4. Gravitational Potential

**Choose appropriate answer:**

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

**Q.3) Solution (a)**

**Scalar** is the measurement of a medium strictly in magnitude.

**Vector** is a measurement that refers to both the magnitude of the medium as well as the direction of the movement the medium has taken.

Impulse is a term that quantifies the overall effect of force acting over time. Since force is a vector quantity, **impulse is also a vector** in the same direction.

Temperature is a scalar quantity. But **change in anything is a vector quantity** because it can go in any direction. The measurement of the increase or decrease in the medium's temperature is a vector quantity.

Gravitational Potential and Power can be fully described by the magnitude or a numerical value alone.

**Q.4) Consider the following statements:**

1. A hydrogen filled balloon works on the principle of Archimedes principle.
2. A hydrogen filled balloon rises only if its total weight is equal to the weight of air it displaces.

**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.4) Solution (a)**

A hydrogen filled balloon works on the principle of Archimedes principle. It will rise as long as the total weight of air displaced by balloon is more than the total weight of balloon.

**Q.5) A person feels weightless during –**

1. He is orbiting in a satellite
2. He is in a free falling lift
3. He is in an aeroplane flying at a high altitude
4. He is having ride in a gas filled balloon

**Choose appropriate answer:**

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

**Q.5) Solution (b)**

A person feels weightless during a free fall and in space.

Note: Initially astronauts were trained for weightlessness in free falling lifts.

**Q.6) Consider the following statements:**

1. Even though the earth and the moon are about the same distance from the sun, yet on the average the earth is much warmer than the moon because the nights on the moon

are much longer.

2. Stars appear to move from East to West because the universe is moving from East to West.

**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.6) Solution (d)**

Statement 1	Statement 2
Incorrect	Incorrect
The earth and the moon are about the same distance from the sun, yet on the average the earth is much warmer than the moon.  Main reason – Since there is no atmosphere on Moon, there is no green house effect to trap the heat.	Since earth rotates from west to east, relatively stars appear to move from east to west.

**Q.7) Compared to the velocity of light, the velocity of radiowaves is:**

- a) Smaller
- b) Greater
- c) The same
- d) Depends on the type of radio waves

**Q.7) Solution (c)**

Both the light waves and radio waves are electromagnetic radiations and move with same velocity.

**Q.8) Polarized sunglasses are used to cut glare from sunlight reflected at a glancing angle off cars, water, and other surfaces. Such sunglasses are a practical application of which of the following physical principles?**

- a) Brewster's law
- b) Lenz's law
- c) Coulomb's law
- d) Snell's law

**Q.8) Solution (a)**

**Explanation:**

According to Brewster's law, reflected light will always be polarized in a horizontal direction, parallel to the reflecting surface. Polarized sunglasses are constructed to block this reflected light and to transmit light polarized only in the vertical direction.

**Q.9) Light waves are composed of both electric and magnetic field. This theory is proposed by**

- a) Newton's corpuscular theory
- b) Huygen's wave theory
- c) Maxwell's theory of light
- d) Plank's theory of light

**Q.9) Solution (c)**

**Explanation:**

- Maxwell's most significant scientific achievement was his electromagnetic theory of light propagation which he first presented in 1864 with the publication of 'A Dynamical Theory of the Electromagnetic Field'. This paper hypothesised that an electric field, a magnetic field and light could all be explained with the using a single theory.
- Maxwell understood the significance of Faraday's work and realised that the speed of an electromagnetic waves travelled at the speed of light. As a result, he was able to incorporate light, magnetism and electricity into a single theory.
- Maxwell further concluded that light propagated in electric and magnetic waves, which he believed would vibrate perpendicular to one another.

Maxwell's electromagnetic theory of light propagation eventually paved the way for a number of major technological innovations.

The first and possibly most significant of these occurred in 1888, when Heinrich Hertz used Maxwell's theory to create instruments capable of sending and receiving radio pulses.

This discovery, contributed to the creation of the television and the microwave and without Maxwell's tireless efforts, many of the modern conveniences upon which society has come to



depend would not exist.

**Q.10) When would a human body be most likely to respire anaerobically?**

- a) When watching TV
- b) When running a marathon
- c) When asleep
- d) When eating

**Q.10) Solution (b)**

Explanation: Running a marathon will cause the body to demand more oxygen than the lungs can provide.

**Q.11) What is a Circumbinary planet?**

- a) It is a planet that orbits one star instead of two
- b) It is a planet that orbits two stars instead of one
- c) It is a planet that orbits three stars instead of two
- d) It is a planet that orbits two starts instead of three

**Q.11) Solution (b)**

A circumbinary planet is a planet that orbits two stars instead of one. Because of the short orbits of some binary stars, the only way for planets to form is by forming outside the orbit of the two stars.

Normally planets revolve around a star, the one like our solar system where all planets revolve round Sun (The only star).

Circumbinary planets are those planets whose orbit encompasses two stars. That is why they are called as circumbinary planets.

Kepler-34(AB) b is a circumbinary planet.

On 15 September 2011, astronomers announced the first partial-eclipse-based discovery of a circumbinary planet. The planet, called Kepler-16b, is about 200 light years from Earth, in the constellation Cygnus, and is believed to be a frozen world of rock and gas, about the mass of Saturn. It orbits two stars that are also circling each other, one about two-thirds the size of our sun, the other about a fifth the size of our sun. Each orbit of the stars by the planet takes 229

days, while the planet orbits the system's center of mass every 225 days; the stars eclipse each other every three weeks or so. Scientists made the finding through NASA's Kepler spacecraft, which launched in 2009 and has been a driving force in the recent explosion in the discovery of distant planets.

A new planet, called Kepler-1647b, was announced on June 13, 2016. It was discovered using the Kepler telescope. The planet is a gas giant, similar in size to Jupiter, which makes it the largest circumbinary planet ever discovered. It is located in the stars' habitable zone, and it orbits the star system in 1107 days, which makes it the longest period of any confirmed transiting exoplanet so far.

**Q.12) Cryogenics finds application in**

- a) Surgery, Space technology and Magnetic levitation
- b) Telemetry, Space technology and Magnetic levitation
- c) Space technology, Surgery and Telemetry
- d) Surgery, Telemetry and Magnetic levitation

**Q.12) Solution (a)**

Telemetry is an automated communications process by which measurements and other data are collected at remote or inaccessible points and transmitted to receiving equipment for monitoring.

**Applications of cryogenics**

- Aerospace-cryogenic engines
- Medical Field
- Manufacturing field
- Electronics Field
- Fuels research

**Q.13) When it is said that the element has 'ductility', what does it mean?**

- a) It can be beaten into thin sheets
- b) It can be drawn into wires
- c) It makes a sonorous sound when it is hit
- d) It can be moulded into any shape after heating

**Q.13) Solution (b)**

Ductility is the property of a metal to be drawn into wires under tensile stress i.e. when it is stretched from the edges.

Malleability is the property of metals which allows it to be beaten into thin sheets rather than crumbling.

These two properties are essential for human use as because of these we are able to shape them into desired structures.

**Q.14) Friction is a force that exists between the two surfaces. Which of the following statements are correct about friction?**

- a) It always acts opposite to the direction of motion of the body.
- b) It always acts in the direction of motion of the body.
- c) It always acts perpendicular to the motion of the body.
- d) None of the above

**Q.14) Solution (a)**

Friction is a force which resists the relative motion between the two surfaces. Higher the roughness, higher is the friction.

Friction always acts parallel to the net force and the direction opposite to it. i.e. in order to retard the motion, the force acts opposite to it.

**Q.15) Consider the following statements:**

- 1. Human ear can hear the sound only between 20 Hz and 2000 Hz.
- 2. Ultrasounds are the medical equipments which use sound of less than 20 Hz.

**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.15) Solution (d)**

For a human ear, the range of audible frequencies is roughly 20 Hz and 20000 Hz. The sounds



less than 20 Hz and over 20,000 Hz are inaudible.

Some animals can hear sounds of frequencies higher than 20,000 Hz. Dogs have this ability. The police use high frequency whistles which dogs can hear but humans cannot.

The ultrasound equipment, familiar to us for investigating and tracking many medical problems, works at frequencies higher than 20,000 Hz.

**Q.16) Because of their portability, size and user friendly nature, induction stoves have become very famous. Consider the following statements regarding induction stoves:**

1. They contain an electric coil which gets heated because of resistance and it heats the vessel.
2. A cooking vessel must be made of ferromagnetic material like cast iron or stainless steel to be directly used over the stove.

**Which of the above statements is/are incorrect?**

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

**Q.16) Solution (a)**

Induction cooking heats a cooking vessel by magnetic induction, instead of by thermal conduction from a flame, or an electrical heating element. Because inductive heating directly heats the vessel, very rapid increases in temperature can be achieved.

In an induction cooker, a coil of copper wire is placed under the cooking pot and an alternating electric current is passed through it. The resulting oscillating magnetic field induces a magnetic flux which repeatedly magnetises the pot, treating it like the lossy magnetic core of a transformer. This produces large eddy currents in the pot, which because of the resistance of the pot, heats it.

For nearly all models of induction cooktops, a cooking vessel must be made of, or contain, a ferromagnetic metal such as cast iron or some stainless steels. However, copper, glass, non magnetic stainless steels, and aluminum vessels can be used if placed on a ferromagnetic disk which functions as a conventional hotplate.

Induction cooking is quite efficient, which means it puts less waste heat into the kitchen, can be quickly turned off, and has safety advantages compared to gas hobs (cooktops). Hobs are also

usually easy to clean, because the hob itself does not get very hot.

**Q.17) The process of transfer of electric charge from a charged object to earth by means of conductor is called Earthing. Almost all plugs in electrical appliances have an earthing wire which is connected to the top pin of a 3 pin plug. You must have observed that the top pin is the longest and the thickest. Why is the earthing pin longest and thickest?**

1. To provide a proper balance to the plug.
2. The longest top pin acts as a hinge in the socket and prevents the plug to fall.
3. So that earth pin touches the circuit first and prevent electric shock.
4. It is thickest so that its conductivity is highest than the other live pins.

**Select the code from below:**

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

**Q.17) Solution (b)**

The conductivity of a metal depends upon its total area. When we insert the plug, the ground wire should touch first, so that any risk of electric shock is removed. Also the top pin should have more conductivity than the other two pins so that given a chance current should flow from that part rather than the other. Hence the top pin is always longer and thicker than the other two pins.

**Q.18) The process of Total Internal Reflection is involved in which of the following phenomenon?**

1. Mirage
2. Looming
3. Shine of a Diamond
4. Rainbow

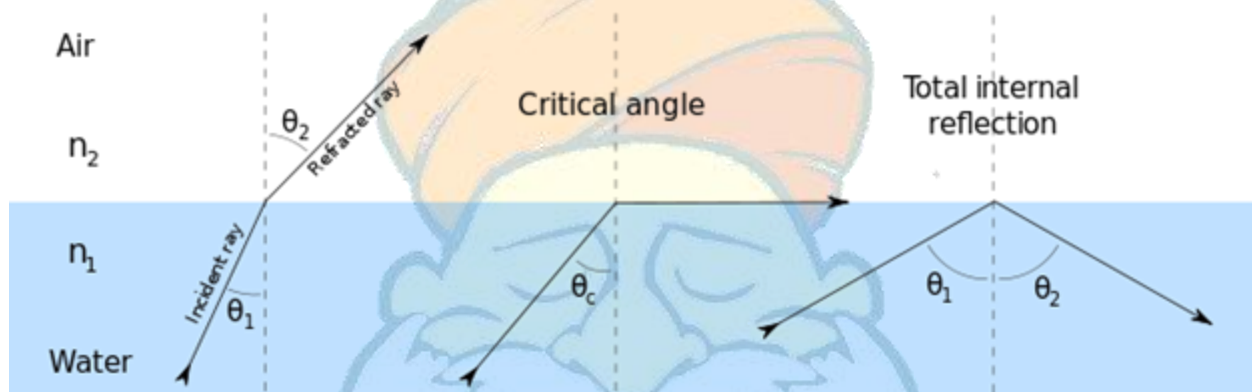
**Select the code from below:**

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

d) All of the above

**Q.18) Solution (d)**

Total internal reflection is the phenomenon which occurs when a propagated wave strikes a medium boundary at an angle larger than a particular critical angle with respect to the normal to the surface. If the refractive index is lower on the other side of the boundary and the incident angle is greater than the critical angle, the wave cannot pass through and is entirely reflected. The critical angle is the angle of incidence above which the total internal reflection occurs. This is particularly common as an optical phenomenon, where light waves are involved, but it occurs with many types of waves, such as electromagnetic waves in general or sound waves.



**Mirage:** A mirage is a naturally occurring optical phenomenon in which light rays are bent to produce a displaced image of distant objects or the sky. Usually because of total internal reflection, there is a false appearance of water on the ground. In older times, people thought it was a lake kept searching for it.

**Looming:** Looming is a phenomenon seen in colder areas where there is temperature inversion. It is an abnormally large refraction of the object that increases the apparent elevation of the distant objects and sometimes allows an observer to see objects that are located below the horizon under normal conditions.

**Shine of a diamond:** The light gets trapped inside the diamond because of its high refractive index. Once the light enters the diamond, there are multiple total internal reflections which traps the light inside it. Hence it shines in the dark.

**Rainbow:** The phenomenon of refraction, diffraction and total internal reflection are involved in the formation of a rainbow.

**Q.19) Which of the following components of a nuclear reactor are correctly matched with**

their use?

**Component : : Use**

1. Moderator : : Slows down the speed of neutron
2. Control rod : : Controls the temperature of the reactor
3. Shield : : Protects the people surrounding the reactor from radioactivity

**Select the code from below:**

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

**Q.19) Solution (c)**

Different components of a nuclear reactor are – fuel, control rod, reactor core, shield, moderator and coolant.

**Moderator:** it slows down the speed of neutron so that they can cause fission. Usually water or Heavy water are used as moderators.

**Control Rod:** is used to absorb the extra neutron. It is also used as a safety measure. In case of emergency, it is used to absorb all the neutrons to suddenly stop the reaction. Usually Boron or Cadmium rods are used.

**Shield:** is the outer thick covering of the reactor which protects the people surrounding the reactor from harmful radioactive radiations.

**Q.20) Which of the following devices uses thousands of mirrors to focus solar energy at one point (usually focus) to generate heat?**

- a) Solar cells
- b) Solar cookers
- c) Solar furnace
- d) Solar heaters

**Q.20) Solution (c)**

A solar furnace is a structure that uses concentrated solar power to produce high temperatures, usually for industry. Parabolic mirrors or heliostats concentrate light (Insolation) onto a focal



point. The temperature at the focal point may reach 3,500 °C (6,330 °F), and this heat can be used to generate electricity, melt steel, make hydrogen fuel or nanomaterials.

The largest solar furnace is at Odeillo in the Pyrénées-Orientales in France, opened in 1970. It employs an array of plane mirrors to gather sunlight, reflecting it onto a larger curved mirror.



Fig: The largest Furnace at Odeillo France

**Q.21) The 'Nord Stream 2' sometimes seen in news is gas pipeline running under which of the following Sea?**

- a) North Sea
- b) Norwegian Sea
- c) Baltic Sea
- d) Adriatic Sea

**Q.21) Solution (c)**



- Nord Stream 2 is a nearly constructed 1,200-kilometre pipeline from Russia to Germany via the Baltic Sea.
- It will run alongside the already constructed Nord Stream and will double the amount of gas being funnelled through the Baltics to 110 billion cubic meters per year.
- Nord Stream 2 has drawn criticism from the US, where it is believed that the project would increase Europe's dependence on Russia for natural gas.



Q.22) The recently launched open platform 'SmartCode' aims to address which of the following?

- a) Inter-State Migration
- b) Fake News Menace
- c) Gender Inequality
- d) Urban Challenges

Q.22) Solution (d)

- SmartCode platform is launched by Ministry of Housing and Urban Affairs.
- **SmartCode** is a platform that enables all ecosystem stakeholders to contribute to a repository of open-source code for various solutions and applications for urban governance.
- It is designed to address the challenges that urban local bodies (ULBs) face in the development and deployment of digital applications.
- It shall enable cities to take advantage of existing codes and customising them to suit local needs, rather than having to develop new solutions from scratch. The source code will be free to use without any licensing or subscription fees.

**Q.23) With reference to Automatic Trigger Safeguard Mechanism (ATSM), consider the following statements:**

1. ATSM will protect the country from any sudden or dramatic increase in imports.
2. Under this mechanism a country can impose safeguard duties on imports automatically at any point of 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.23) Solution (a)**

Statement 1	Statement 2
Correct	Incorrect
Automatic Trigger Safeguard Mechanism (ATSM) is a special safeguards mechanism included in the agreements like Comprehensive Economic Cooperation and Partnership Agreement (CECPA). <b>This will protect the country from any sudden or dramatic increase in imports.</b>	<b>Under this mechanism, if the imports of a product are rising alarmingly, then after reaching a certain threshold (not at any point of time), a country can impose safeguard duties on imports from another country automatically.</b> The same provision applies to Indian imports as well in other country which is a party to the agreement.

**Q.24) Which of the following Ministry has decided to set up a Digital Intelligence Unit (DIU)?**

- a) Ministry of Home Affairs
- b) Ministry of Finance
- c) Ministry of Electronics and Information Technology
- d) Ministry of Communication

**Q.24) Solution (d)**

- **The Ministry of Communications has decided to set up a Digital Intelligence Unit (DIU) as a nodal agency to deal with complaints of unsolicited commercial communication (UCC)** and cases of financial fraud, especially in the digital payments space.
- DIU will coordinate with various law enforcement agencies, financial institutions and telecom service providers in investigating any fraudulent activity involving telecom resources.
- Apart from the DIU a Telecom Analytics for Fraud Management and Consumer Protection (TAFMCP) will also be set up at all the 22 license service area levels.

**Q.25) With reference to the Codex Alimentarius Commission (CAC), consider the following statements:**

1. It is an international cyber security standards body.
2. It was established by the INTERPOL.
3. India is one of its members.

**Which of the statements given above is/are correct?**

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

**Q.25) Solution (c)**

Statement 1	Statement 2	Statement 3
Incorrect	Incorrect	Correct
<b>The Codex Alimentarius Commission (CAC) is an international food standards body.</b>	<b>It was established jointly by the Food and Agriculture organization (FAO) and the World Health Organization (WHO) in May 1963 with the objective of protecting consumer's health and ensuring fair practices in food trade.</b>	Currently the CAC has 189 Codex Members made up of 188 Member Countries and 1 Member Organization (The European Union). <b>India became the member of Codex Alimentarius in 1964.</b>

**Q.26) World's smallest adult reptile was recently discovered in which of the following Hotspots of Biodiversity?**

- a) Indo-Burma
- b) Western Ghats and Srilanka
- c) Madagascar and the Indian Ocean Islands
- d) Southwest Australia

**Q.26) Solution (c)**

**A chameleon discovered in Madagascar** by scientists from Germany and Madagascar may be the **world's smallest adult reptile**.

**Q.27) With reference to Indian modern history, consider the following events:**

- 1. Vaikom Satyagraha
- 2. Chauri Chaura incident
- 3. Moplah rebellion
- 4. Bardoli Satyagraha

**Arrange the above events in their correct chronological order.**

- a) 2 – 3 – 1 – 4

- b) 2 – 3 – 4 – 1
- c) 3 – 2 – 1 – 4
- d) 3 – 2 – 4 – 1

**Q.27) Solution (c)**

- The **Chauri Chaura incident took place on 4 February 1922** at Chauri Chaura in the Gorakhpur district of the United Province (modern Uttar Pradesh) in British India.
- Prime Minister inaugurated the Chauri Chaura Centenary Celebrations at Chauri Chaura, Gorakhpur, Uttar Pradesh, on 4th February 2021.
- Moplah rebellion - 1921
- Vaikom Satyagraha - 1924–25.
- Bardoli Satyagraha - 1928.

**Q.28) India's first 'Metro-Neo', a Mass Rapid Transit System will be adopted in which of the following State/UTs?**

- a) Maharashtra
- b) Andhra Pradesh
- c) Delhi
- d) West Bengal

**Q.28) Solution (a)**

- **India's first Metro-Neo will be adopted in Maharashtra's Nashik.** It is a Mass Rapid Transit System (MRTS) that aims to provide a comfortable, rapid, energy-efficient and less noisy transport medium in the city of Nashik. The project will be implemented by Maharashtra Metro Rail Corporation Ltd (Maha-Metro).
- The central government recently urged all state governments to consider using MetroNeo technology in their tier-2 and tier-3 cities.
- The MetroNeo service consists of electric bus coaches – their lengths varying from 18 to 25 meters – with a carrying capacity of 200 to 300 passengers at a time.
- The buses will have rubber tyres and draw power from an overhead electric wire with 600-750 V DC supply, similar to railways or trams.



**Q.29) The Maguri Motapung wetland is an Important Bird Area located near which of the following National Park?**

- a) Dibru Saikhowa National Park
- b) Dachigam National Park
- c) Sunderban National Park
- d) Bhitarkanika National Park

**Q.29) Solution (a)**

- Mandarin duck was recently spotted in the Maguri-Motapung beel (wetland) in Assam.
- Mandarin duck is considered the most beautiful duck in the world and its IUCN Status is Least Concern.
- The migratory duck breeds in Russia, Korea, Japan and north-eastern parts of China. The duck, however, rarely visits India as it does not fall in its usual migratory route.
- **The Maguri Motapung wetland is located close to the Dibru Saikhowa National Park in Upper Assam.** It is an Important Bird Area.

**Q.30) Consider the following statements regarding the National Safety Council:**

1. It aims to generate, develop and sustain a voluntary movement on Safety, Health, and Environment (SHE) at the national level.
2. It is an autonomous body set up by the Ministry of Labour and Employment.

**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.30) Solution (d)**

Statement 1	Statement 2
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Correct	Correct
National Safety Council is a non-profit, self-financing apex body at the national level in India. <b>Its objective is to generate, develop and sustain a voluntary movement on Safety, Health, and Environment (SHE) at the national level.</b>	<b>It is an autonomous body which was set up by the Government of India, Ministry of Labour and Employment on 4 March 1966.</b> It was registered as a Society under the Societies Registration Act, 1860 and subsequently, as a Public Trust under the Bombay Public Trust Act, 1950.

**Read the following passages and answer the question that follows the passage. Your answer to these questions should be based on passage only.**

**Passage 1**

Developed countries have made adequate provisions for social security for senior citizens. State insurers (as well as private ones) offer Medicare and pension benefits to people who can no longer earn. In India, with the collapse of the joint family system, the traditional shelter of the elderly has disappeared. And a State faced with a financial crunch is not in a position to provide social security. So, the working population should give serious thought to building a financial base for itself.

**Q.31) Which one of the following if it were to happen, weakens the conclusion drawn in the above passage the most?**

- The investable income of the working population, as a proportion of its total income, will grow in the future
- The insurance sector is underdeveloped and trends indicate that it will be extensively privatized in the future
- India is on a path of development that will take it to a developed country status, with all its positive and negative implications
- If the working population builds a stronger financial base, there will be a revival of the joint family system

**Q.31) Solution (c)**

The main conclusion of the paragraph is that the working population should save for its future given that the Indian state is not in a position to provide social security for its citizens. The underlying assumption is that the Indian state would not be in a position to provide social security even in the future. If option c is true, then this assumption is attacked and the

conclusion is weakened.

### Passage 2

Until the end of his first year at school, Cyril retained many of the pleasures and pursuits he had brought with him from home, and he kept an old interest in butterflies and fossils. His grandmother had presented him with a fine bird's eggs cabinet, but he could never bring himself to risk in climbing trees. Once or twice he dissected dead birds from sheer determination to overcome his horror of the operation. Probably it was his envy of those physically unlike himself that brought on a phase during which he drew massive athletes with thick necks and square shoulders. Again he pitied himself for what he could never be.

**Q.32) The reason Why Cyril made drawings of athletes was that**

- a) though he admired them, he lacked a fine physique himself
- b) he loved violent exercises
- c) athletics was a passion with him
- d) he had to complete an assignment

**Q.32) Solution (a)**

Refer to the last 2 lines of the passage.

**Q.33) There are 4 members in a committee. If one of them is replaced by a younger member such that the average age of the committee is as it was 6 years ago. The new member is how many years younger than the member replaced?**

- a) 42 years
- b) 24 years
- c) 6 years
- d) None of the above

**Q.33) Solution (b)**

Let the present average age of committee is  $x$  years. So, the total age is  $4x$  years.

Let the age of the person replaced is  $y$  years and that of the new member is  $z$  years. According to the question

$$(4x - y + z)/4 = (x - 6)$$

$$4x - y + z = 4x - 24$$

$$y - z = 24$$

**Q.34)** A group of eight students are experimenting in the laboratory. If the average reading of eight students is 35.5, the average reading of first two students is 28 and the average reading of next three students is 36, the reading of 6th student is 8 more than the seventh one and the eighth one is 8 more than the sixth one, then find the reading of the sixth student

- a) 40
- b) 49
- c) 56
- d) 39

**Q.34) Solution (a)**

$$\text{Sum of readings of all 8 students} = 35.5 \times 8 = 284$$

$$\text{Sum of readings of first two students} = 2 \times 28 = 56$$

$$\text{Sum of readings of next three students} = 3 \times 36 = 108$$

$$\text{So, sum of last three readings} = 284 - 56 - 108 = 120$$

Let, the reading of 6th student be  $x$

According to the question,

$$x + (x - 8) + (x + 8) = 120$$

$$3x = 120$$

$$x = 40$$

Therefore, the reading of sixth student = 40

So, option a is the correct answer.

**Q.35)** The average age of 3 children in a family is 20% of the average age of the father and the eldest child. The total age of the mother and the youngest child is 39 years. If the father's age is 26 years, what is the age of the second child?

- a) 20 years
- b) 15 years
- c) 18 years
- d) Can't be determined

**Q.35) Solution (d)**

Let 'A' be the age of the eldest son. 'B' be the age of the second son, 'C' be the age of the youngest son, 'F' be the age of the father and 'M' be the age of the mother.

Therefore,  $20/100(F+A/2) = A+B+C/3$

$$\Rightarrow 3F = 7A + 10B + 10C \text{ and } M+C = 39$$

We know that,  $F = 26$  years, thus,  $7A + 10B + 10C = 78$  and  $M+C = 39$

There are 4 variables and two equations, thus the value of B cannot be determined.

