



VIDHVATH ACADEMY FOR COMPETITIVE EXAMS

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SUBJECT WISE TEST: VPT045 SCIENCE AND TECHNOLOGY TEST BOOKLET

Time Allowed: 120 mins

Maximum Marks: 200

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS BOOKLET DOES NOT HAVE ANY UNPRINTED OR TURN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
 2. ENCODE CLEARLY THE TEST BOOKLET SERIES A, B, C OR D AS THE CASE MAY BE IN THE APPROPRIATE PLACE IN THE ANSWER SHEET.
 3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside. Do NOT write anything else on the Test Booklet.
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4. This Test Booklet contains 100 items (Questions). Each item is printed in English. Each item comprises four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response with you consider the best. In any case, choose ONLY ONE response for each item.
 5. You have to mark all your responses ONLY on the separate Answer Sheet provided. See direction in the answers sheet.
 6. All items carry equal marks. Attempt all items. Your total marks will depend only on the number of correct responses marked by you in the answer sheet. For every incorrect response $1/3^{\text{rd}}$ of the allotted marks will be deducted.
 7. Before you proceed to mark in the Answer sheet the response to various items in the Test booklet, you have to fill in some particulars in the answer sheets as per instruction sent to you with your Admission Certificate.
 8. After you have completed filling in all responses on the answer sheet and the examination has concluded, you should hand over to Invigilator only the answer sheet. You are permitted to take away with you the Test Booklet.
 9. Sheet for rough work are appended in the Test Booklet at the end.

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

1. Consider the following statements :

1. Artificial Intelligence systems learn from experiences and use them in decision-making.
2. Machine learning makes predictions about new and unknown data with minimal errors.
3. Natural Language Processing is used by search engines to suggest the next word in the sentence while typing keywords.

How many of the above statements is/are correct ?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

2. Total internal reflection can take place when light travels from :

1. Air to glass
2. Glass to water
3. Air to water
4. Diamond to glass

Select the correct codes from the options given below :

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

3. "It has the day temperature upto 430°C and night temperature upto -180°C . It takes 59 days to complete one rotation. It doesn't have moons. Its surface resembles the surface of the moon. It's gaseous outer layer has the greatest percentage of oxygen compared to other planets." The above description refers to which of the following planets?

- (a) Mercury
- (b) Earth
- (c) Jupiter
- (d) Saturn

4. Consider the following statements with respect to Smart Cities Mission :

1. It aims to promote cities that provide core infrastructure, a clean and

sustainable environment and a decent quality of life to their citizens.

2. It is a central sector scheme with a main focus on a sustainable and inclusive development approach.
3. The Mission is under the Ministry of Rural Development.

Which of the statements given above is/are correct ?

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

5. Consider the following statements :

1. Statement-I : Graphite and diamond are isotopes of Carbon.
2. Statement-II : Though Graphite and diamond are made of the same element, they have different physical properties and structural arrangements of atoms.

Which one of the following is correct in respect of the above statements ?

- (a) Both Statement-I and Statement-II are correct and Statement-II explains Statement-I
- (b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement-I
- (c) Statement-I is correct, but Statement-II is incorrect
- (d) Statement-I is incorrect, but Statement-II is correct

6. Recently India's first space based mission to study the Sun, "Aditya L1" has been launched. Which of the following detectors are used by the spacecraft to study the sun ?

1. Electromagnetic detector
2. Particle detector
3. Magnetic Field detector
4. Doppler current profile detector

Select the answer using the codes given below:

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

(d) 1, 2, 3 and 4

7. Consider the following :

1. USA
2. Russia
3. Japan
4. China
5. India

How many of the countries mentioned above have Global Navigation Satellite Systems (GNSS) ?

- (a) Only two
- (b) Only three
- (c) Only four
- (d) All five

8. With reference to Indian biodiversity, Indian peafowl, black kite, and Giant Grey Shrike are:

- (a) Birds
- (b) Reptiles
- (c) Amphibians
- (d) Primates

9. Which of the following statements is correct ?

- (a) The speed of the sound in a medium depends on the temperature of the medium.
- (b) The speed of sound varies for different frequencies in a given medium under the same physical conditions.
- (c) The speed of the sound in solid medium is less than the speed of the sound in gas medium at constant temperature.
- (d) All the above

10. Consider the following statements :

1. Unlike a free proton, a free neutron is unstable.
2. Unlike Coulomb's law or Newton's law of gravitation, there is no simple mathematical form of the nuclear force.
3. The nuclear force does not depend on the electric charge.

Which of the statements given above is/are correct ?

(a) 2 only

(b) 1 and 2 only

(c) 3 only

(d) 1, 2 and 3

11. With reference to the Astra Mark 2 missile, consider the following statements:

1. It is a air-to-air missile with a dual pulse solid rocket motor.
2. It aims to target a range of over 100 km and will engage and destroy highly maneuverable supersonic aerial targets.
3. It was designed and developed by the Defense Research and Development Laboratory (DRDL).

Which of the above statements is/are correct?

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

12. Recently, India protested Chinese road construction at Shaksam Valley, which is located at

- (a) West of Gilgit
- (b) East of Aksai chin
- (c) North of Siachen glacier
- (d) South of Nubra valley

13. Consider the following statements :

1. It consists of long chain molecules aligned in a particular direction.
2. It works on the principle of Malus' law in physics.
3. It can be used to control the intensity, sunglasses and windowpanes
4. They are used in photographic cameras and 3D movie cameras.

The above statements refer to which of the following ?

- (a) Prism
- (b) Polaroids
- (c) Optical fibres
- (d) Diffraction slit

14. Consider the following statements with respect to Free Space Optical Communication :

1. It uses light propagating in free space to wirelessly transmit data for telecommunications.
2. It utilises the infrared band of spectrum for data transmission.
3. It can be used to transmit data between two points which have a direct line of sight.

How many of the statements given above are correct ?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

15. Consider the following :

1. Android
2. Linux
3. Mozilla Firefox
4. VLC media player
5. Python

How many of the software mentioned above belong to the category of Open-source software (OSS) ?

- (a) Only two
- (b) Only three
- (c) Only four
- (d) All five

16. Consider the following countries :

1. Canada
2. France
3. India
4. Russia
5. Japan
6. United States

Which of the above countries are part of the G7 grouping countries ?

- (a) 1, 2, 3 and 4
- (b) 2, 3, 4 and 5
- (c) 1, 2, 5 and 6
- (d) 1, 3, 5 and 6

17. "Photolithographic technology", recently seen in news is related to which of the following ?

- (a) Production of semiconductors
- (b) Protein synthesis prediction
- (c) Bio 3D printing
- (d) Remote sensing technology

18. Consider the following :

1. Prithivi II missile
2. Agni IV missile
3. DHANUSH missile
4. BRAHMOS missile

Which of the above-mentioned are Ballistic Missile that are currently operational in the Indian

Defence Force ?

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

19. Consider the following statements:

1. Higher concentrations of this pollutant damage the leaves of plants and retard the rate of photosynthesis.
2. It is a lung irritant that can lead to an acute respiratory disease in children.
3. It is harmful to various textile fibres and metals.
4. It is a secondary pollutant which is toxic to living tissues.

The above statements refer to which of the following pollutants ?

- (a) Carbon dioxide
- (b) Nitrogen dioxide
- (c) Volatile organic compounds
- (d) Sulphur oxide

20. Consider the following statements regarding Diplomatic passports :

1. Like normal passports, diplomatic passports are valid for 10 years.
2. Diplomatic passports are also provided to relatives and immediate families of officers employed in the Indian Foreign Service (IFS).
3. Holders of diplomatic passports are entitled to certain privileges and immunities as per international law.

Which of the statements given above is/are correct ?

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

21. Consider the following statements with reference to mass and energy :

1. Both matter and energy can neither be created nor destroyed.
2. Though energy can be transformed from one form to another, the total energy of an isolated system remains constant.
3. Though the principle of conservation of energy cannot be proved, no violations have ever been observed.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

22. Consider the following pairs : Scientific technologies Principles

1. Tokamak - Magnetic confinement of plasma
2. Neuromorphic computing - Spiking neural network
3. Optical fibres - Total internal reflection of light

How many of the above pairs are correctly matched ?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

23. With respect to Missions to planet Mars, consider the following statements :

1. The Mars Orbiter Mission is the India's first interplanetary mission to study the Martian surface features, morphology and mineralogy and return the samples to the Earth.
2. The MAVEN mission is the first mission by NASA to study the Martian upper atmosphere.

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

24. The 'Helmand, Harirod-Murghab, Panj-Amu' are the river basins of which among the following countries ?

- (a) Afghanistan
- (b) Bhutan
- (c) Nepal
- (d) Bangladesh

25. Consider the following statements :

1. The surface web search engines cannot discover or display results for web pages within the dark web.
2. The dark web is hidden by various network security measures like firewalls and encryption.
3. The peer-to-peer (P2P) overlay network technique is used to TOR browsers to provide access to dark web.

Which of the statements given above is/are not correct ?

- (a) 1 only
- (b) 1 and 2 only
- (c) 3 only
- (d) None

26. End-to-end encryption (E2EE) is a type of messaging that keeps messages private from everyone, including the messaging service. How many of the following apps used in India has E2EE Facility ?

1. What's App
2. Telegram
3. Gmail
4. Instagram
5. Facebook

Choose the correct answer using the codes given below :

- (a) Only two
- (b) Only three
- (c) Only four
- (d) All five

27. Which of the following is not an example of exothermic reactions ?
- Burning of natural gas.
 - Decomposition of vegetable matter into compost.
 - Decomposition of calcium carbonate to calcium oxide and carbon dioxide on heating.
 - Breaking down of carbohydrates to form glucose, combines with oxygen to provide energy.

28. Which of the following States has banned oleander flowers in temple offerings after a woman died after accidentally chewing the leaves of the oleander plant ?
- Kerala
 - Tamil Nadu
 - Uttar Pradesh
 - Haryana

29. Consider the following statements :

- Statement 1 :The Gravitational force plays a key role in the formation and evolution of stars, galaxies and galactic clusters.
- Statement 2 :The gravitational force is the weakest force among the Fundamental forces in nature.

Which one of the following is correct in respect of the above statements ?

- Both Statement I and Statement II are correct, and Statement II is the correct explanation of Statement I
- Both Statement I and Statement II are correct, but Statement II is not the correct explanation of Statement I
- Statement I is correct, but Statement II is incorrect
- Statement I is incorrect, but Statement II is correct

30. With reference to Multiple Independently Targetable Re-entry Vehicle (MIRV) technology, consider the following statements :

- It enables single missiles to target multiple locations hundreds of kilometres apart.
- India's longest-range ballistic missile, Agni-V, has been tested with this technology recently.
- MIRV-equipped missiles can be launched from land only.

Which of the statements given above are correct ?

- 1 only
- 1 and 2 only
- 2 and 3 only
- 1, 2 and 3

31. With respect to Electronic Fiber, consider the following statements :

- It utilises the human body as part of the Circuit.
- It enables wireless visual–digital interactions.
- It can work without the need of batteries or chips

How many of the above statements are correct?

- Only one
- Only two
- All three
- None

32. Consider the following statements :

- The temple in Hampi is a prime example of Dravidian architecture.
- The sanctum sanctorum houses the Shiva lingam, the main object of worship.
- The temple is a UNESCO World Heritage Site.
- The temple gained prominence and underwent extensive expansion in the 14th century during the Vijayanagara Empire.

Which of the following temples is described above ?

- Chandikeswara temple
- Virupaksha temple
- Chausath yogini temple
- Someshwara temple

33. Consider the following statements regarding the Agnibaan SOrTed-01 mission :

1. It is India's first semi-cryogenic engine-powered rocket launched from a private launch pad.
2. It is the world's first single-piece engine designed and built indigenously through additive manufacturing.
3. The purpose of the mission is to serve as a test flight and to demonstrate the in-house and home grown technologies.

How many of the statements given above are correct ?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

34. Consider the following parts of a plant :

1. Petiole
2. Lamina
3. Stamens
4. Pistil
5. Reticulate

How many of the above are parts of a flower?

- (a) Only two
- (b) Only three
- (c) Only four
- (d) All five

35. With reference to the Small Satellite Launch Vehicle (SSLV), consider the following statements :

1. It can carry payloads weighing up to 500 kg.
2. The launch vehicle can be assembled in less than a week by a much smaller team.
3. Currently, India has a share of participation of about 22% in the space economy along with Australia and Russia.

How many of the above statements are correct?

- (a) Only one
- (b) Only two

- (c) All three
- (d) None

36. In which one of the following groups are all four countries members of BIMSTEC ?

- (a) Brazil, Iran, Saudi Arabia and Vietnam
- (b) Indonesia, Japan, South Korea and Singapore
- (c) Australia, Canada, Malaysia and New Zealand
- (d) India, Sri Lanka, Nepal and Thailand

37. "Tetra chloroethene" is a compound that contaminates the ground water and is a suspected carcinogen. It is most likely used as a solvent in which of the following?

- (a) Bleaching of Paper
- (b) Food Preservatives
- (c) Solution to Clean Turbid Water
- (d) Dry Cleaning of Clothes

38. Consider the following statements :

1. Statement 1 : Clean water would have more BOD value than highly polluted water.
2. Statement 2 : The amount of Biological Oxygen Demand in the water measures of the amount of organic material in the water.

Which one of the following is correct in respect of the above statements ?

- (a) Both Statement I and Statement II are correct, and Statement II is the correct explanation of Statement I
- (b) Both Statement I and Statement II are correct, but Statement II is not the correct explanation of Statement I
- (c) Statement I is correct, but Statement II is incorrect
- (d) Statement I is incorrect, but Statement II is correct

39. Consider the following statements :

1. The photoelectric emission is an instantaneous process that involves the conversion of electrical energy into light energy.

2. All free electrons in a metal have the same energy.

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

40. The term “*Stellaria mcclintockiae*”, recently seen in the news, is related to :
- (a) Plant species found in western ghats
 - (b) Butterfly species found in eastern ghats
 - (c) Bird species found in western ghats
 - (d) A mammal found in Himalayas

41. With reference to semiconductors, consider the following statements :
1. Electric vehicles use power management chips which have high voltage and high current applications.
 2. At zero kelvin temperature, intrinsic semiconductors show properties similar to insulators.
 3. Doping helps in increasing the conductivity of a pure semiconductor.
 4. Light emitting diodes are heavily doped semiconductors that convert mechanical energy into light.

Which of the above statements is/are correct ?

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

42. Which of the following best describes “SAGA-220” ?
- (a) An AI tool to determine the age of a foetus in a pregnant woman
 - (b) A supercomputer developed by ISRO
 - (c) A Supersonic missile developed by DRDO
 - (d) A new variety of cocoa developed by ICAR

43. Which of the following statements is not correct with reference to “2024 PT5”, recently seen in the news ?
- (a) It is an asteroid that has been pulled into Earth’s orbit, making it a temporary “mini-moon.”
 - (b) It originates from a group of Near-Earth asteroids that share a similar orbit around the sun as Earth.
 - (c) It will circle the Earth for only 57 days before resuming its journey through space.
 - (d) It is the first such event to be reported in more than a century

44. Recently, for the first time, India has set up its own pavilion at the World Hydrogen Summit 2024, which was held in :
- (a) Stockholm, Sweden
 - (b) Rotterdam, Netherland
 - (c) Berlin, Germany
 - (d) Brussels, Belgium

45. According to this phenomenon, while approaching a stationary source of sound with high speed, the pitch of the sound heard appears to be higher than that of the source and as the distance between observer and the source increases, the observed pitch becomes lower than that of the source. It is commonly used to check overspeeding of vehicles. This phenomenon also has applications in areas such as military, medical science, astrophysics, etc.

Which of the following denotes the above described phenomenon ?

- (a) Theory of sonics
- (b) Fizeau effect
- (c) Tyndall effect
- (d) Doppler effect

46. Arrange the following phenomena in the order of increasing energy in terms of Joules :
1. Thunderstorm
 2. Big bang
 3. Rotational energy of the earth

4. Energy to break one bond in DNA
Select the correct answer using the code given below

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

47. Consider the following statements :

- 1. Statement-I :The light passing into the event horizon of the Black Hole cannot escape into space.
- 2. Statement II :In the Event horizon, the escape velocity is greater than the velocity of light.

Which one of the following is correct in respect of the above statements ?

- (a) Both Statement-I and Statement-II are correct, and Statement-II explains Statement-I
- (b) Both Statement-I and Statement-II are correct, but Statement-II does not explain Statement I
- (c) Statement I is correct, but Statement II is incorrect
- (d) Statement I is incorrect, but Statement II is correct

48. Consider the following statements regarding Naegleria fowleri :

- 1. It is a free-living amoeba or a single-celled living organism.
- 2. It causes a rare contagious disease that affects the central nervous system.
- 3. It is found at very low temperatures that are conducive to its growth and can survive for short periods in warm environments.

Which of the statements given above is/are correct ?

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

49. Consider the following rows with respect to Chandrayan 3 : Sl.No. Payload Placed In Objective

- 1. Langmuir probe Lander To measure the near surface plasma density.
- 2. Alpha Particle X-ray Spectrometer Rover To determine the element composition of lunar soil.
- 3. LASER Retroreflector Array Lander to understand the dynamics of Moon system
- 4. Spectro-polarimetry of HAbitable Planet Earth Propulsion Module Future discoveries of smaller planets

In How many of the above rows is the given information correctly matched?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

50. Consider the following statements with respect to GaganyaanMission :

- 1. The development of first module of Bharatiya Anthariksh Station - India's Own Space Station is done under this mission.
- 2. The CE20 cryogenic engine of ISRO is to be used in the Human Rated Launch Vehicle of Gaganyaan Mission.
- 3. After the human spaceflight, the Gaganauts will be landed back on the Landing Complex built at the Satish Dhawan Space Centre, Sriharikota.

How many of the statements given above are correct ?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

51. Consider the following statements :

- 1. Statement I : The moon has no atmosphere on its own.
- 2. Statement II : Since the radius and acceleration due to the gravity of the moon are small, the escape velocity of the moon is five times smaller than the Earth.

Select the correct answer using the code given below :

- (a) Both Statement I and Statement II are true and Statement II is the correct explanation of Statement I.
- (b) Both Statement I and Statement II are true, but Statement II is not the correct explanation of Statement I.
- (c) Statement I is true but Statement II is false
- (d) Statement I is false but Statement II is true.

- 52.** Which article of the Indian Constitution provides a constitutional safeguard ensuring that a person who is arrested shall not be detained without being informed of the grounds for arrest and shall not be denied the right to consult and be defended by a legal practitioner ? ?
- (a) Article 21
 - (b) Article 22
 - (c) Article 24
 - (d) Article 25

- 53.** Consider the following statements with reference to a mirage :
1. The refractive index of air decreases with its density.
 2. In colder regions, Objects appear to be elevated or floating above the horizon during mirage.
 3. Mirages can be observed in hot deserts and travelling on a vehicle during hot summers.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

- 54.** Consider the following : “It is a collective network of connected devices and the technology that facilitates communication between devices and the cloud and between the devices themselves. It allows them to collect and share data. Centres of Excellence have been established for this network at Bengaluru, Gurugram and Gandhi Nagar.”

The statements given above describe which of the following technologies ?

- (a) Block Chain Technology
- (b) Internet of Things
- (c) Metaverse
- (d) Augmented Reality

- 55.** Consider the following statements with respect to Quantum Key Distribution :

1. Quantum key distribution utilises the properties of quantum mechanics to develop a secure dedicated communications link.
2. In Public key encryption of messages, the same key is used to encrypt and decrypt the message.
3. In Private key encryption of messages, two different keys are used to encrypt and decrypt the message.

How many of the statements given above are correct ?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

- 56.** Consider the following statements regarding Asset Reconstruction Companies :

1. It is a financial institution that buys non-performing assets or bad assets from banks and financial institutions to clean their balance sheets.
2. National Asset Reconstruction Company Limited (NARCL) is a government entity registered with the Reserve Bank of India as an Asset Reconstruction Company.

Which of the above statements is/are correct?

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

- 57.** With respect to Huygens's principle, consider the following statements :

1. Waves from a point source spread out in all directions while light travel along narrow rays.

2. The limit of the ability of microscopes and telescopes to distinguish very close objects is set by the wavelength of light.

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

58. Consider the following statements regarding the classification of missiles :

1. On the basis of propulsion, Aluminum powder is used as solid fuel and hydrocarbons are used in liquid propulsion technology.
2. In the wire guidance system, the command signals are passed along a wire dispensed from the missile while in the Inertial guidance, accelerometers are used in control systems.

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

59. Consider the following statements with respect to NISAR Mission :

1. It is the first Low Earth Orbit observatory being jointly developed by NASA and ISRO.
2. It contains high frequency S-Band radar developed by ISRO to obtain a high-resolution data on surface deformation on earth.
3. The High-rate Science Downlink System and GPS receivers of the mission are to be indigenously developed by ISRO.

Which of the statements given above are not correct ?

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

60. The World Economic Situation and Prospects (WESP) 2024 report was released by :

- (a) World Bank
- (b) United Nations
- (c) International Monetary Fund
- (d) Organization for Economic Co-operation and Development

61. Consider the following statements with respect to WEB 5.0 :

1. It adds the feature of emotional intelligence to the internet.
2. It provides complete control for the users to their data.
3. It incorporates the semantic capabilities provided by Web 3.0.

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

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

62. Consider the following statements :

1. Positronium is a fundamental atomic system comprising baryons and leptons.
2. Electrons and Positrons interact through electromagnetic and weak forces.

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

63. Which of the following atmospheric phenomena is caused when a vertical beam of light appears to extend above and/or below a light source that develops as a result of ice crystals slowly falling through the air reflecting the sun's rays ?

- (a) Halos
- (b) Aurora
- (c) Sundogs
- (d) Sun Pillars

64. Consider the following statements regarding the World Wildlife Crime Report, 2024 :

1. The Report focuses on trends in the illegal trade and assesses the causes and impacts of wildlife trafficking and associated crime globally.
2. Based on seizure records, Coral pieces are the most frequently traded illegal item followed by live specimens like ornamental plants.
3. The Report was released by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Which of the statements given above are correct ?

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

65. The Sky appears blue in colour because of,

1. Absence of dust particles and air molecules at higher altitudes
2. The shorter wavelengths of sunlight are scattered more than the longer wavelengths.

Select the correct answer using the codes given below :

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

66. Which of the following astronomical phenomena can be classified as an 'Astronomical transients' ?

1. Supernovae
2. Active Galactic Nucleus
3. Fast radio burst

Select the correct answer using the codes given below :

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

67. Consider the following statements with reference to forces of nature :

1. Gravitational force is always attractive, unlike electromagnetic force, which can be attractive or repulsive.
2. Unlike gravitational force, electromagnetic force needs an intervening medium to travel over large distances.
3. Protons, neutrons, and electrons experience strong nuclear force equally.

Which of the statements given above is/are correct ?

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

68. With respect to Poliomyelitis disease, consider the following statements :

1. It is a contagious disease spread mainly through the faecal-oral route.
2. The incubation period of the disease is 7–10 days.
3. The Virus in the disease causes paralysis within a few hours of infection.
4. Of the 3 strains of wild Poliomyelitis, type 1 remains only in two countries.

How many of the statements given above are correct ?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

69. Consider the following statements :

1. Geostationary Satellites remain stationary in the sky with respect to the ground stations, while Sun-Synchronous Satellites pass over a spot on Earth at a given time every day.
2. Geostationary Satellites are widely used for telecommunications in India, whereas Sun Synchronous Satellites

are preferred in remote sensing and imaging satellites.

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

70. Consider the following statements with respect to Black Holes :

- 1. They are huge concentrations of matter packed into very tiny spaces.
- 2. The rings of gas surrounding the Black Hole emit X-rays.
- 3. As moving away from the center of the black hole, the thickness of the rings reduces.

How many of the statements given above are correct ?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

71. Consider the following : Sl.No. Moon Belong to Planet Description

- 1. Titan Saturn Only moon with a dense atmosphere like the earth
- 2. Callisto Jupiter Second Largest moon in the solar system
- 3. Europa Saturn Has atmosphere primarily composed of oxygen
- 4. Triton Neptune Moon with Seasonal change and weather pattern

In which of the above rows is the given information correctly matched ?

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

72. Consider the following statements regarding the Red List of Mangrove Ecosystems :

- 1. It is the first-ever global assessment by the International Union for Conservation of Nature.

- 2. Nearly one-third of the global mangrove ecosystem is affected due to global sea-level rise.
- 3. The Eastern parts of India are categorised as vulnerable in the Red list of Mangrove Ecosystems.

Which of the above statements is/are correct ?

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

73. Which of the following devices is used for detecting an optical signal ?

- (a) Photodiodes
- (b) Light emitting diodes
- (c) Photovoltaic device
- (d) Invertor

74. Which of the following is the reason for an object to float when placed on the surface of water ?

- (a) The gravitational pull acting on the object is greater than the up thrust of water on the object.
- (b) The density of the object is greater than the density of the water
- (c) The density of the object is less than the density of the water
- (d) The up thrust of water on the object is less than the weight of the object.

75. With reference to the Anti-Submarine Warfare Shallow Water Craft (ASW SWC) project, consider the following statements :

- 1. The Mahe class of ASW SWC ships, named after ports of strategic importance along the Indian coast, will undertake anti-submarine operations and mine-laying operations.
- 2. The ASW SWC ships with over 80% Indigenous content, which boosts India's progress towards 'Aatmanirbhar Bharat'.

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

76. Consider the following statements regarding rare diseases in India:

- 1. Over 75% of rare disease cases in India are found in children.
- 2. A majority of patients with rare diseases in India survive into adulthood.
- 3. The National Policy for Rare Diseases 2021 provides financial assistance for rare disease treatments.

How many of the above statements is/are incorrect?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

77. Consider the following statements about superconductors and their applications:

- 1. Superconductors are primarily used in MRI machines due to their ability to carry large currents without resistance.
- 2. Superconductors are widely used in electrical grids for efficient energy transmission without losses.
- 3. High-temperature superconductors require temperatures below -100°C to function optimally.
- 4. Superconductors can be used in magnetic levitation trains (maglev) for frictionless transportation.

Which of the above statements is/are correct?

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

78. Consider the following statements regarding the role of the President of India in appointing the Chief Justice of India (CJI):

- 1. The President can appoint the Chief Justice of India on the advice of the Prime Minister.
- 2. The President can reject the recommendation of the outgoing CJI for any reason.
- 3. The President appoints the CJI based on the Memorandum of Procedure, which is a guideline document.

Which of the above statements is/are correct?

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

79. Consider the following statements about the Citizenship Act, 1955 and Section 6A of the Act:

- 1. The Citizenship Act, 1955 bars illegal immigrants from obtaining citizenship in India.
- 2. Section 6A was inserted to address the specific demographic challenges in Assam post-1971 due to illegal migration.
- 3. Citizenship in India is governed under Part II of the Indian Constitution, and matters of citizenship fall under the Union List.

Which of the above statements is/are correct?

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

80. Which of the following statements about Association for Democratic Reforms (ADR) is incorrect?

- (a) ADR advocates for transparency in inner-party democracy and political party functioning.
- (b) ADR has led campaigns to ensure political parties disclose their sources of funding.
- (c) ADR is a partisan organization that aligns itself with specific political parties.
- (d) ADR promotes the empowerment of voters by providing them with

information on political candidates' backgrounds.

81. Consider the following statements regarding Constitutional Morality.

1. Assertion (A): Constitutional Morality is essential for safeguarding individual rights in a diverse democracy like India.
2. Reason (R): It ensures that governance is based on popular opinion rather than constitutional values.

Which one of the following is correct?

- (a) Both A and R are correct, and R is the correct explanation of A.
- (b) Both A and R are correct, but R is not the correct explanation of A.
- (c) A is correct, but R is incorrect.
- (d) A is incorrect, but R is correct.

82. Consider the following statements regarding the independence of the Election Commission of India (ECI):

1. The salaries and allowances of the CEC and ECs are charged directly from the Consolidated Fund of India.
2. The government has the power to remove Election Commissioners through an executive order without parliamentary approval.
3. The Election Commission can independently amend the Representation of the People Act, 1951, without Parliament's approval.

How many of the above statements are incorrect?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

83. Consider the following battles fought by Chhatrapati Shivaji Maharaj:

1. Battle of Pratapgad
2. Battle of Palkhed
3. Battle of Purandar
4. Battle of Sinhagad

How many of the above battles were personally led or involved by Shivaji Maharaj?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

84. Which of the following measures can prevent an MP from losing their seat under Article 101(4)?

- (a) Applying for leave of absence from the Committee on Members' Absence
- (b) Requesting an exemption from the Election Commission of India
- (c) Seeking permission from the Prime Minister's Office
- (d) Challenging the decision in the Supreme Court before the 60-day mark

85. Consider the following statements regarding the implementation of the National Credit Framework (NCrF):

1. The NCrF is compulsory for all higher education institutions in India.
2. It allows for the flexible transfer of credits across various educational streams.
3. The NCrF promotes experiential learning through activities like on-the-job training and apprenticeships.
4. It emphasizes the integration of performing arts and social work into the credit system.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

86. Consider the following statements regarding FATF's black and grey lists:

1. Countries on the FATF grey list receive financial aid from the International Monetary Fund (IMF) and World Bank.

2. Countries on the FATF blacklist face severe international financial sanctions and restrictions, including denial of loans from global financial institutions.
3. Being on the FATF grey list does not harm a country's international reputation or standing.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

87. Consider the following statements:

1. Village Defense Committees (VDCs) assist in local surveillance in border regions, particularly in Jammu and Kashmir.
2. Community policing programs engage local populations to help identify and report suspicious activities along borders.
3. The Integrated Border Management System (IBMS) depends primarily on community policing for its success.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

88. Consider the following statements about Mohiniyattam:

1. Mohiniyattam is also called the "dance of enchantment."
2. It is the only classical dance form to originate in Kerala.
3. Mohiniyattam emphasizes gentle, fluid movements and is performed solo.
4. It was historically patronized by the Travancore kings.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two

- (c) Only three
- (d) All four

89. Consider the following statements regarding the Quad (Quadrilateral Security Dialogue):

1. The Quad is a formal military alliance between its member countries.
2. The Quad nations account for around 35% of the world's GDP.
3. Annual Quad Leaders' Summits have provided high-level guidance through joint statements.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

90. Consider the following statements about the Colombo Security Conclave (CSC):

1. The Colombo Security Conclave is a bilateral initiative between India and Sri Lanka.
2. The CSC aims to enhance regional security by addressing transnational threats.
3. Disaster relief and cyber security are part of the CSC's focus areas.

How many of the above statements is/are incorrect?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

91. Consider the following statements regarding Prime Minister Dhan-Dhaanya Krishi Yojana (PMDKY):

1. The scheme focuses on promoting smart irrigation techniques such as drip irrigation and solar-powered pumps.
2. It is applicable only to marginal and small farmers with landholdings of less than 2 hectares.
3. PMDKY encourages crop diversification by incentivizing

farmers to switch from cereals to pulses and oilseeds.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

92. What is the primary mechanism of action for an mRNA-based cancer vaccine?

- (a) It delivers mRNA to cells, instructing them to produce tumor-specific antigens
- (b) It modifies the patient's DNA to resist cancer cell growth
- (c) It injects synthetic antibodies that target cancerous cells
- (d) It activates dormant cancer-fighting bacteria in the gut microbiome

93. Which Tamil dynasty had maritime trade links with Rome and China during the Sangam Age?

- (a) Pallavas
- (b) Cholas
- (c) Pandyas
- (d) Cheras

94. Consider the following statements regarding the strategic importance of Aero India:

1. It serves as a platform for foreign defense companies to collaborate with Indian firms for technology transfer.
2. Aero India is officially recognized by the United Nations as a defense-trade exhibition.
3. The event will feature aerial demonstrations of both Indian and foreign fighter jets.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

95. Which institution regulates and monitors the issuance of Sovereign Green Bonds (SGrBs) in India?

- (a) Reserve Bank of India (RBI)
- (b) Securities and Exchange Board of India (SEBI)
- (c) Ministry of Finance
- (d) Ministry of Environment, Forest and Climate Change

96. What is the primary objective of Exercise Dharma Guardian?

- (a) Strengthening maritime security cooperation between India and Japan
- (b) Conducting joint military counter-terrorism operations under UN guidelines
- (c) Establishing a permanent military base in Japan for Indian forces
- (d) Conducting joint space and cyber warfare training between India and Japan

97. Consider the following statements regarding President's Rule in India:

1. It is imposed under Article 356 when the President is satisfied that governance in a state cannot be carried out per constitutional provisions.
2. It can be extended indefinitely beyond three years with the approval of Parliament.
3. When President's Rule is in force, the Governor assumes all executive powers, and the State Legislative Assembly is either dissolved or suspended.
4. The Supreme Court has no power to review the imposition of President's Rule as it is a matter of executive discretion.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

98. Consider the following statements regarding the National Commission for Safai Karamcharis (NCSK):

1. The commission is under the administrative control of the Ministry of Social Justice and Empowerment.
2. It has the authority to impose fines and sanctions on local governments for violations of manual scavenging laws.
3. NCSK members are appointed by the President of India.
4. The commission monitors compliance with Supreme Court directives related to the welfare of sanitation workers.

How many of the above statements is/are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

99. Consider the following statements regarding the impact of the Zamindari System in India:

1. It led to increased agricultural productivity due to the efficient revenue collection system.
2. It resulted in land alienation, forcing many peasants into debt and bonded labor.
3. It was abolished immediately after India's independence without any legal challenges.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None

100. Consider the following statements.

1. Statement-I: The repo rate directly determines the interest rates on home loans, vehicle loans, and other commercial lending.
2. Statement-II: A reduction in the repo rate always leads to an immediate and equal reduction in commercial lending rates.

Select the correct answer code:

- (a) Both Statement-I and Statement-II are correct, and Statement-II is the correct explanation for Statement-I
- (b) Both Statement-I and Statement-II are correct, but Statement-II is not the correct explanation for Statement-I.
- (c) Statement-I is correct, but Statement-II is incorrect.
- (d) Statement-I is incorrect but Statement-II is correct