



VIDHVATH ACADEMY FOR COMPETITIVE EXAMS

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SUBJECT WISE TEST SERIES:VST009 SCIENCE AND TECHNOLOGY **TEST BOOKLET**

Time Allowed: 60mins

Maximum Marks: 100

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.
4. This Test Booklet contains 50 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 $1/4^{\text{TH}}$ 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 regarding the Neutrino:

1. The neutrino is a tiny elementary particle which is not part of the atom.
2. Neutrino has a very tiny mass and with no electrical charge.

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

2. Consider the following statements regarding the Black Hole:

1. A black hole is a place in space where gravity pulls so much that even light cannot get out.
2. The super-massive black hole at the center of the Milky Way galaxy is called SagittariusA.
3. Sun is not a big enough star to make a black hole.

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 only

3. Consider the following statements about kalaazar:

1. It is caused by Fungi.
2. The only drug available against leishmaniasis is miltefosine.

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

4. Consider the following statements with respect to Scramjet engine:

1. ISRO successfully test fired scramjet engine and realized the critical technology of Air Breathing Propulsion System in 2016.

2. The Scramjet engine designed by ISRO uses Oxygen as fuel and the Hydrogen from the atmospheric air as the oxidizer.

Which of the following codes below given is/are NOT correct?

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

5. With reference to Nipah virus, consider the following statements:

1. It is a zoonotic virus.
2. The only available vaccine is the antiviral drug Ribavirin.

Which of the above statements is/are not correct?

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

6. Which of the following statements is/are correct about "Arthropod"?

1. They are everywhere and are the largest animal phylum.
2. Arthropods are cold blooded animals.

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

7. Consider the following statements with reference to the New Space India Limited:

1. New Space India Limited is a Central Public Sector Enterprise of the Government under the administrative control of the Department of Space.
2. New Space India Limited will handle ISRO's commercial deals for satellites and launch vehicles with foreign customers.

Which of the above statements is/are correct?

- (a) 1 only

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

8. Which of the following is/are potential benefits of using Neem Coated Urea in farms?

1. It increases the solubility of Urea in water.
2. It leads to reduction in pest and disease attack.

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

9. Consider the following statements with reference to the Shukrayaan Mission:

1. The Shukrayaan orbiter will be the second mission to Venus by the India Space Research Organization (ISRO).
2. It aims to investigate the surface processes and shallow subsurface stratigraphy; and solar wind interaction with Venusian Ionosphere.

Which of the above statements is/are correct?

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

10. Consider the following statements with reference to PSLV and GSLV:

1. PSLV has the capability to put a heavier payload in orbit than the GSLV.
2. PSLV is designed mainly to deliver earth observation or remote sensing satellites, whereas GSLV has been designed for launching communication satellites.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only

- (c) Both 1 and 2
- (d) Neither 1 nor 2

11. Bollgard I and Bollgard II technologies are mentioned in the context of

- (a) clonal propagation of crop plants
- (b) developing genetically modified crop plants
- (c) production of plant growth substances
- (d) production of biofertilizers

12. Which of the following statements is not correct regarding "The Large Hadron Collider (LHC)"?

1. It is a project of NASA for Nuclear Research with collaboration with scientists and hundreds of universities and laboratories, other countries.
2. The LHC's goal is to allow physicists to test the predictions of different theories of particle physics.

Select the answer using the code given below:

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

13. Consider the following statements regarding the "air-breathing propulsion system":

1. It utilizes the atmospheric oxygen during their flight and reduces the total propellant required to place a satellite in orbit.
2. Ramjet, Scramjet and Dual Mode Ramjet (DMRJ) are the examples of air-breathing engines.

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

14. Consider the following statements regarding the benefits of Gene Editing:

1. It can be used to treat many human diseases & genetic disorders like HIV/AIDS, hemophilia.
2. It could form the basis of highly efficient & cost effective next generation antibiotics.
3. It can be used to bring to life extinct species.

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

15. 'Dark Genome', a term recently seen in the news, is related to:

- (a) It is the DNA whose presence or absence differentiates one organism from other.
- (b) It is the recently discovered sequence of genomes responsible for most cancers.
- (c) It is a gene which is responsible for mutations in most of the RNA viruses.
- (d) It refers to those genes/proteins for which there is minimal knowledge on biological function.

16. Consider the following properties of the Virus:

1. It is metabolically inactive outside the host cell.
2. They are known to infect all kinds of cells except bacteria.
3. All Corona viruses are RNA viruses.

Which of the statements given above is/are correct?

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

17. Which of the following is the correct description of the term 'RNA interference' (RNAi)?

- (a) Substances that inhibit the development of RNA in embryos.

- (b) Incorrect sequences of RNA produced due to external interferences.
- (c) Incorrect sequences of RNA produced due to internal interferences.
- (d) A gene-silencing technology

18. Consider the following statements:

1. Some microorganisms can grow in environments with temperature above the boiling point of water.
2. Some microorganisms can grow in environments with temperature below the freezing point of water.
3. Some microorganisms can grow in a highly acidic environment with a pH below 3.

How many of the above statements are correct?

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

19. Consider the following statements:

1. Ballistic missiles are jet-propelled at subsonic speeds throughout their flights, while cruise missiles are rocketpowered only in the initial phase of flight.
2. Agni-V is a medium-range supersonic cruise missile, while BrahMos is a solid-fuelled intercontinental ballistic missile.

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

20. Which one of the following statements best describes the role of B cells and T cells in the human body?

- (a) They protect the body from environmental allergens.
- (b) They alleviate the body's pain and inflammation.
- (c) They act as immunosuppressant's in the body.

- (d) They protect the body from the diseases caused by pathogens.

21. Consider the following:

1. Carbon monoxide
2. Nitrogen oxide
3. Ozone
4. Sulphur dioxide

Excess of which of the above in the environment is/are cause(s) of acid rain?

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

22. Consider the following:

1. Aarogya Setu
2. CoWIN
3. DigiLocker
4. DIKSHA

Which of the above are built on top of open-source digital platforms?

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

23. Which one of the following is a reason why astronomical distances are measured in light-years?

- (a) Distances among stellar bodies do not change.
- (b) Gravity of stellar bodies does not change.
- (c) Light always travels in a straight line.
- (d) Speed of light is always the same.

24. In the context of hereditary diseases, consider the following statements:

1. Passing on mitochondrial diseases from parent to child can be prevented by mitochondrial replacement therapy either before or after in vitro fertilization of egg.
2. A child inherits mitochondrial diseases entirely from mother and not from father.

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

25. Consider the following:

1. Bacteria
2. Fungi
3. Virus

Which of the above can be cultured in artificial/synthetic medium?

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

26. Consider the following statements with reference to Transgenic organisms:

1. They can be used for biofortification.
2. They can be made resistant to diseases.
3. Their introduction may lead to loss of biodiversity.
4. They can be used to extend the shelf life of certain products.

Which of the statements given above are correct?

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

27. How is Deoxyribonucleic Acid (DNA) different from Ribonucleic Acid (RNA)?

1. DNA is located in the nucleus while RNA is found in the cytoplasm of the cell.
2. DNA is a double-stranded molecule while RNA is a single-stranded molecule.
3. DNA replicates on its own, while RNA does not replicate on its own.

Select the correct answer using the code given below:

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

28. Which of the following is/are the characteristics of Semiconductors?

1. Formed due to ionic bonding
2. Positive temperature coefficient
3. Only four valence electrons in the outermost orbit.

Select the correct answers using the code given below:

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

29. With reference to the 5G, consider the following statements:

1. The 5G networks will operate in the mm-Wave spectrum.
2. Use of mm-Wave spectrum may result in Out-ofband emission.

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

30. Consider the following statements regarding the Defence Research and Development Organization (DRDO):

1. DRDO is the R&D (Research and Development) wing of the Ministry of Science & Technology.
2. It was formed in 1958 from the amalgamation of the Technical Development Establishment (TDEs) of the Indian Army and the Directorate of Technical Development & Production (DTDP) with the Defence Science Organization (DSO).

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

31. Consider the following statements:

1. Fungi are only single celled organisms.

2. Fungi doesn't cause diseases in humans.

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

32. Which of the following is/are correct regarding Partial Parasitic Plants:

1. They are also called holoparasitic plants.
2. They are chlorophyllous (contain chlorophyll).
3. They have a worldwide distribution in tropical as well as temperate habitats.

Select the correct answer using the code given below:

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

33. With reference to BrahMos Missile, consider the following statements:

1. It is a joint venture between India and Russia.
2. It operates on the "Fire and Forgets" principle.
3. Brahmos is currently operationally deployed at a speed nearly thrice the speed of sound.

Which of the statements given above is/are correct?

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

34. Consider the following statements regarding the Bio-energy Crops:

1. Bio-energy crops can induce a cooling effect on the areas where they are cultivated.
2. Wheat, corn, main edible oilseeds/edible oils, sugarcane, and other crops are some of the Bio-energy crops.

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

35. With reference to the James Webb Space Telescope, consider the following statements:

1. It is considered a successor of the Kepler Mission and will extend and complement its discoveries.
2. It is the result of an international collaboration between NASA, the European Space Agency (ESA) and the Canadian Space Agency.

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

36. Consider the following statements:

1. Inactivated Vaccines use a weakened (or attenuated) form of the germ that causes a disease.
2. They are used to protect diseases such as Hepatitis A, Flu, Polio and Rabies.

Which of the above statements is/are correct?

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

37. Which of the following is/are the significance of the Imaging X-ray Polarimetry Explorer (IXPE) mission launched by NASA:

1. It will observe polarized X-rays from neutron stars.
2. It will help scientists understand the location of black holes in the past.
3. It will help unravel how pulsars shine so brightly in X-rays.

Select the correct answer using the code given below:

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

38. Quasi Satellites has been recently in the news. Which of the following statements most appropriately describes it?

- (a) It is a satellite-based on quantum computing.
- (b) Satellite to be launched on the far side of the moon
- (c) Satellites of Mars
- (d) Space rocks near the earth's orbit that moves around the Sun

39. Consider the following statement with respect to "Mission Lucy":

1. It is a joint project of NASA and the European Space Agency.
2. The mission will visit 8 asteroids covering a distance of about 6.3 million km.
3. Trojan asteroids, unlike other asteroids, do not share orbit of a planet.

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

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

40. Consider the following statement with respect to Indian Space Association (ISpA):

1. ISpA will act as a single-window and independent agency on matters related to space technology.
2. ISpA has been created to protect Indian Space Research Organization (ISRO) from private competitors in the future.
3. ISpA will also act as the marketing arm of ISRO.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 1 and 3 only

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

41. With reference to the Coronal Mass Ejections, consider the following statements:

1. It is the phenomenon of the sun spewing out vast quantities of gas and plasma.
2. It can have a damaging effect on satellites and radio communication networks on Earth.

Which of the above statements is/are correct?

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

42. The XENON1T experiment recently in the news is associated with which of the following?

- (a) Reactivity of Noble Gases
- (b) Dark Matter detection
- (c) Nuclear Magnetic Resonance (NMR) spectroscopy
- (d) Red Blood Cell (RBC) production

43. With reference to the Agni V Missiles, consider the following statements:

1. It is a surface-to-air tactical missile.
2. It has been developed under the Integrated Guided Missile Development Programme (IGMDP).
3. It is a fire and forget missile which once fired cannot be stopped in any case.

Which of the statements given above is/are correct?

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

44. Consider the following statements:

1. Biomethanation is a process by which organic material is microbiologically converted to biogas under anaerobic conditions.

2. The Ministry of New and Renewable Energy and UNIDO launched the Interest Subvention Scheme to provide financial assistance to innovative waste to energy biomethanation projects.

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

45. Consider the following statements regarding transgenic crops:

1. Bt Brinjal is the only transgenic crop allowed in India.
2. Bt cotton is a transgenic crop that produces toxic protein against the pest called pink bollworm.
3. The genetic modification is DMH-11 mustard enabled self pollination in the crop.

Which of the statements given above is/are correct?

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

46. Consider the following statements regarding Superfluidity of Helium:

1. Super fluidity is the frictionless flow of electrons observed in liquid helium at room temperature.
2. A Single Electron Bubble (SEB) is created when an electron is injected into the superfluid form of Helium.

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

47. 'New Shephard' was recently in the news, it is?

- (a) New techniques that will help increase productivity of sheeps.

- (b) A rocket system that has been designed to take astronauts in space.
- (c) American solar powered fighter plane.
- (d) Newly discovered exo-planet by NASA.

48. Consider the following statements:

1. Bt cotton is the only transgenic crop approved by the Government of India for commercial cultivation.
2. Bt cotton has been genetically modified making the plant resistant to the herbicide glyphosate which has carcinogenic effects.

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

49. Consider the following statements:

1. Technology Development Board (TDB) is a statutory body.
2. TDB provides only technical assistance to enterprises.
3. TDB confers National Award for contribution to science and technology in India.

Which of the statements given above are correct?

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

50. Consider the following statements regarding Aditya-L1 Mission:

1. It is India's first scientific expedition to study the Sun.
2. It will be launched using the Polar Satellite Launch Vehicle (PSLV).
3. It will be placed in polar sun synchronous orbit.

Which of the statements given above are correct?

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