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Science & Technology

2018

1. Consider the following pairs:

Commonly used/consumed materials likely to be

1. Lipstick —
2. Soft Drinks —
3. Chinese fast food —

Unwanted or controversial chemicals found in them

- Lead
- Brominated vegetable oils
- Monosodium glutamate

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

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

2. With reference to India's satellite launch vehicles, consider the following statements:

1. PSLVs launch the satellites useful for Earth resources monitoring whereas GSLVs are designed mainly to launch communication satellites.
2. Satellites launched by PSLV appear to remain permanently fixed in the same position in the sky, as viewed from a particular location on Earth.
3. GSLV Mk III is a four-staged launch vehicle with the first and third stages using solid rocket motors; and the second and fourth stages using liquid rocket engines.

Which of the statements given above is/are correct?

(a) 1 only

(b) 2 and 3

(c) 1 and 2

(d) 3 only

3. Consider the following:

1. Birds
2. Dust blowing
3. Rain
4. Wind blowing

Which of the above spread plant diseases?

(a) 1 and 3 only

(b) 3 and 4 only

(c) 1, 2 and 4 only

(d) 1, 2, 3 and 4

4. What is "Terminal High Altitude Area Defense (THAAD)", sometimes seen in the news?

(a) An Israeli radar system

(b) India's indigenous anti-missile programme

(c) An American anti-missile system

(d) A defence collaboration between Japan and South Korea.

5. "3D printing" has applications in which of the following?

1. Preparation of confectionery items
2. Manufacture of bionic ears
3. Automotive industry
4. Reconstructive surgeries
5. Data processing technologies

Select the correct answer using the code given below.

(a) 1, 3 and 4 only

(b) 2, 3 and 5 only

(c) 1 and 4 only

(d) 1, 2, 3, 4 and 5

6. With reference to the Indian Regional Navigation Satellite System (IRNSS), consider the following statements:

1. IRNSS has three satellites in geostationary and four satellites in geosynchronous orbits.
2. IRNSS covers entire India and about 5500 sq. km beyond its borders.
3. India will have its own satellite navigation system with full global coverage by the middle of 2019.

Which of the statements given above is/are correct?

(a) 1 only

(b) 1 and 2 only

(c) 2 and 3 only

(d) None

7. Consider the following statements:

1. Light is affected by gravity.
2. The Universe is constantly expanding.
3. Matter warps its surrounding space-time.

Which of the above is/are the prediction/predictions of Albert Einstein's General Theory of Relativity, often discussed in media?

(a) 1 and 2 only

(b) 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

8. With reference to the Genetically Modified mustard (GM mustard) developed in India, consider the following statements:

1. GM mustard has the genes of a soil bacterium that give the plant the property of pest-resistance to a wide variety of pests.
2. GM mustard has the genes that allow the plant cross-pollination and hybridization.
3. GM mustard has been developed jointly by the IARI and Punjab Agricultural University.

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

9. Consider the following pairs:

*Terms sometimes
seen in news*

Context/Topic

- | | | |
|--------------------------|---|-------------------------|
| 1. Belle II experiment | — | Artificial Intelligence |
| 2. Blockchain technology | — | Digital/Cryptocurrency |
| 3. CRISPR – Cas9 | — | Particle Physics |

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

(a) 1 and 3 only

(b) 2 only

(c) 2 and 3 only

(d) 1, 2 and 3

10. When the alarm of your smartphone rings in the morning, you wake up and tap it to stop the alarm which causes your geyser to be switched on automatically. The smart mirror in your bathroom shows the day's weather and also indicates the level of water in your overhead tank. After you take some groceries from your refrigerator for making breakfast, it recognises the shortage of stock in it and places an order for the supply of fresh grocery items. When you step out of your house and lock the door, all lights, fans, geysers and AC machines get switched off automatically. On your way to office, your car warns you about traffic congestion ahead and suggests an alternative route, and if you are late for a meeting, it sends a message to your office accordingly.

In the context of emerging communication technologies, which one of the following terms best applies to the above scenario?

(a) Border Gateway Protocol

(b) Internet of Things

(c) Internet Protocol

(d) Virtual Private Network

11. In which of the following areas can GPS technology be used?

1. Mobile phone operations
2. Banking operations
3. Controlling the power grids

Select the correct answer using the code given below:

(a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

12. The terms 'WannaCry, Petya and Eternal Blue' sometimes mentioned in the news recently are related to

- (a) Exoplanets
- (b) Cryptocurrency
- (c) Cyber attacks**
- (d) Mini satellites

13. The identity platform 'Aadhaar' provides open "Application Programming Interfaces (APIs)". What does it imply?

1. It can be integrated into any electronic device.
2. Online authentication using iris is possible.

Which of the statements given above is/are correct?

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

14. India enacted the Geographical Indications of Goods (Registration and Protection) Act, 1999 in order to comply with the obligations to

- (a) ILO
- (b) IMF
- (c) UNCTAD
- (d) WTO**

15. What is/are the consequence/consequences of a country becoming the member of the 'Nuclear Suppliers Group'?

1. It will have access to the latest and most efficient nuclear technologies.

2. It automatically becomes a member of "The Treaty on the Non-Proliferation of Nuclear Weapons (NPT)".

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

2017

16. Consider the following statements:

1. In tropical regions, Zika virus disease is transmitted by 'the same mosquito that transmits dengue.
2. Sexual transmission of Zika virus disease is possible

Which of the statements given above is/are correct?

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

17. What is the purpose of 'evolved Laser Interferometer Space Antenna' (eLISA) project?

- (a) To detect neutrinos
- (b) To detect gravitational waves**
- (c) To detect the effectiveness of missile defence system
- (d) To study the effect of solar flares on our communication systems

18. What is the application of Somatic Cell Nuclear Transfer Technology?

- (a) Production of biolarvicides
- (b) Manufacture of biodegradable plastics
- (c) Reproductive cloning of animals**
- (d) Production of organisms free of diseases

19. With reference to agriculture in India, how can the technique of 'genome sequencing', often seen in the news, be used in the immediate future?

1. Genome sequencing can be used to identify genetic markers for disease resistance and drought tolerance in various crop plants.
2. This technique helps in reducing the time required to develop new varieties of crop plants.
3. It can be used to decipher the host-pathogen relationships in crops

Select the correct answer using the code given below:

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

20. In India, it is legally mandatory for which of the following to report on cyber security incidents?

1. Service providers
2. Data centers
3. Body corporate

Select the correct answer using the codes given below:

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

(d) 1, 2 and 3

21. Organic Light Emitting Diodes (OLEDs) are used to create digital display in many devices. What are the advantages of OLED displays over Liquid Crystal displays?

1. OLED displays can be fabricated on flexible plastic substrates.
2. Roll-up displays embedded in clothing can be made using OLEDs.
3. Transparent displays are possible using OLEDs.

Select the correct answer using the codes given below:

(a) 1 and 3 only

(b) 2 only

(c) 1, 2 and 3

(d) None of the above statement is correct

2016

22. 'Project Loon', sometimes seen in the news, is related to

(a) waste management technology

(b) wireless communication technology

(c) solar power production technology

(d) water conservation technology

23. Which of the following statements is/are correct?

Viruses can infect

1. bacteria
2. fungi
3. plants

Select the correct answer using the code given below:

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

24. Consider the following statements:

The Mangalyaan launched by ISRO

1. is also called the Mars Orbiter Mission
2. made India the second country to have a spacecraft orbit the Mars after USA
3. made India the only country to be successful in making its spacecraft orbit the Mars in its very first attempt

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

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

25. With reference to 'Astrosat', the astronomical observatory launched by India, which of the following statement(s) is/are correct?

1. Other than USA and Russia, India is the only country to have launched a similar observatory into space.
2. Astrosat is a 2000 kg satellite placed in an orbit at 1650 km above the surface of the Earth.

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**

26. Which one of the following is the best description of ‘INS Astradharini’, that was in the news recently?

(a) Amphibious warfare ship

(b) Nuclear-powered submarine

(c) Torpedo launch and recovery vessel

(d) Nuclear-powered aircraft carrier

27. India is an important member of the ‘International Thermonuclear Experimental Reactor’. If this experiment succeeds, what is the immediate advantage of India?

(a) It can use thorium in place of uranium for power generation.

(b) It can attain a global role in satellite navigation

(c) It can drastically improve the efficiency of its fission reactors in power generation

(d) It can build fusion reactors for power generation

28. In the context of the developments in Bioinformatics, the term ‘transcriptome’, sometimes seen in the news, refers to

(a) a range of enzymes used in genome editing

(b) the full range of mRNA molecules expressed by an organism

(c) the description of the mechanism of gene expression

(d) a mechanism of genetic mutation taking place in cells

29. With reference to pre-packed items in India, it is mandatory to the manufacturer to put which of the following information on the main label, as per the Food Safety and Standards (Packaging and Labelling) Regulation, 2011?

1. List of ingredients including additives
2. Nutrition information

3. Recommendations, if any, made by the medical profession about the possibility of any allergic reaction
4. Vegetarian/non-vegetarian

Select the correct answer using the codes given below:

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

30. With reference to 'LiFi', recently in the news, which of the following statement(s) is/are correct?

1. It uses light as the medium for high speed data transmission.
2. It is a wireless technology and several times faster than 'WiFi'.

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

31. With reference to 'Bitcoins', sometimes seen in the news, which of the following statement(s) is/are correct?

1. Bitcoins are tracked by the Central Banks of the countries.
2. Anyone with a Bitcoin address can send and receive Bitcoins from anyone else with a Bitcoin address.
3. Online payments can be sent without either side knowing the identity of the other.

Select the correct answer using the codes given below.

- (a) 1 and 2 only
- (b) 2 and 3 only**

(c) 3 only

(d) 1, 2 and 3

32. What is ‘Greased Lightning-10 (GL-10)’, recently in the news?

(a) Electric plane tested by NASA

(b) Solar-powered two-seater aircraft designed by Japan

(c) Space observatory launched by China

(d) Reusable rocket designed by ISRO

33. What is Medecins Sans Frontiers (MSF)?

(a) An agency formed by the International Olympic Committee (IOC) to check misuse of drugs by sportspersons

(b) A non-governmental organization which specializes in international humanitarian aid and emergency medical assistance

(c) An organization to develop applications of nanotechnology in medicine

(d) An organization of medical practitioners funded by the European Union which carries out reach against spread of AIDS

2015

34. With reference to ‘fly ash’ produced by the power plants using coal as fuel, which of the following statements is/are correct?

1. Fly ash can be used in the production of bricks for building construction.
2. Fly ash can be used as a replacement for some of the Portland cement contents of concrete.
3. Fly ash is made up of silicon dioxide and calcium oxide only, and does not contain any toxic elements.

Select the correct answer using the code given below.

(a) 1 and 2

(b) 2 only

(c) 1 and 3

(d) 3 only

35. In the context of modern scientific research, consider the following statements about 'IceCube', a particle detector located at South Pole, which was recently in the news:

1. It is the world's largest neutrino detector, encompassing a cubic kilometre of ice.
2. It is a powerful telescope to search for dark matter.
3. It is buried deep in the ice.

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

36. The term 'Goldilocks Zone' is often seen news in the context of

(a) the limits of habitable zone above the surface of the Earth

(b) regions inside the Earth where shale gas is available

(c) search for the Earth-like planets in outer space

(d) search for meteorites containing precious metals

37. With reference to 'fuel cells' in which hydrogen-rich fuel and oxygen are used to generate electricity, consider the following statements:

1. If pure hydrogen is used as a fuel, the fuel cell emits heat and water as by-products.
2. Fuel cells can be used for powering buildings and not for small devices like laptop computers.
3. Fuel cells produce electricity in the form of Alternating Current (AC).

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

38. In which of the following activities are Indian Remote Sensing (IRS) satellites used?

1. Assessment of crop productivity
2. Locating groundwater resources
3. Mineral exploration
4. Telecommunications
5. Traffic studies

Select the correct answer using the codes given below.

(a) 1, 2 and 3 only

(b) 4 and 5 only

(c) 1 and 2 only

(d) 1, 2, 3, 4 and 5

39. With reference to the use of Nano-technology in health sector, which of the following statement(s) is/are correct?

1. Targeted drug delivery is made possible by nanotechnology.
2. Nanotechnology can largely contribute to gene therapy.

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

40. H1N1 virus is sometimes mentioned in the news with reference to which one of the following diseases?

- (a) AIDS
- (b) Bird flu
- (c) Dengue
- (d) Swine flu**

41. With reference to ‘Near Field Communication (NFC) Technology’, which of the following is/are correct?

1. It is a contactless communication technology that uses electromagnetic radio fields.
2. NFC is designed for use by devices which can be at a distance of even a metre from each other.
3. NFC can use encryption when sending sensitive information.

Select the correct answer using the codes given below.

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

2014

42. Which of the following are some important pollutants released by steel industry in India?

1. Oxides of sulphur
2. Oxides of nitrogen
3. Carbon monoxide
4. Carbon dioxide

Select the correct answer using the code given below

(a) 1, 3 and 4 only

(b) 2 and 3 only

(c) 1 and 4 only

(d) 1, 2, 3 and 4

43. Lichens, which are capable of initiating ecological succession even on a bare rock, are actually a symbiotic association of

(a) Algae and bacteria

(b) Algae and fungi

(c) Bacteria and fungi

(d) Fungi and mosses

44. Which one of the following is the process involved in photosynthesis?

(a) Potential energy is released to form free energy

(b) Free energy is converted into potential energy and stored

(c) Food is oxidized to release carbon dioxide and water

(d) Oxygen is taken, and carbon dioxide and water vapour are given out.

45. Which of the following is/are the example/examples of chemical change?

1. Crystallization of sodium chloride
2. Melting of ice
3. Souring of milk

Select the correct answer using the code given below.

(a) 1 and 2 only

(b) 3 only

(c) 1, 2 and 3

(d) None

46. Which of the following statements is/are correct regarding vegetative propagation of plants?

1. Vegetative propagation produces clonal population.
2. Vegetative propagation helps in eliminating the virus.
3. Vegetative propagation can be practiced most of the year.

Select the correct answer using the code given below.

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

47. Consider the following pairs:

Vitamin Deficiency disease

1. Vitamin C Scurvy
2. Vitamin D Rickets
3. Vitamin E Night blindness

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

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

48. Consider the following techniques/phenomena:

1. Budding and grafting in fruit plants
2. Cytoplasmic male sterility
3. Gene silencing

Which of the above is/are used to create transgenic crops?

(a) 1 only

(b) 2 and 3

(c) 1 and 3

(d) None

49. Among the following organisms, which one does not belong to the class of other three?

(a) Crab

(b) Mite

(c) Scorpion

(d) Spider

50. Consider the following statements:

1. Maize can be used for the production of starch.
2. Oil extracted from maize can be a feedstock for biodiesel.
3. Alcoholic beverages can be produced by using maize.

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

51. Consider the following diseases

1. Diphtheria
2. Chickenpox
3. Smallpox

Which of the above diseases has/have been eradicated in India?

(a) 1 and 2 only

(b) 3 only

(c) 1, 2 and 3

(d) None

52. Consider the following:

1. Bats
2. Bears
3. Rodents

The phenomenon of hibernation can be observed in which of the above kinds of animals?

(a) 1 and 2 only

(b) 2 only

(c) 1, 2 and 3

(d) Hibernation cannot be observed in any of the above

53. Which of the following adds/add carbon dioxide to the carbon cycle on the planet Earth?

1. Volcanic action
2. Respiration
3. Photosynthesis
4. Decay of organic matter

Select the correct answer using the code given below.

(a) 1 and 3 only

(b) 2 only

(c) 1, 2 and 4 only

(d) 1, 2, 3 and 4

54. Which of the following pair(s) is/are correctly matched?

Spacecraft

Purpose

1. Cassini-Huygens : Orbiting the Venus and transmitting data to the Earth
2. Messenger : Mapping and investigating the Mercury
3. Voyager 1 & 2 : Exploring the outer solar system

Select the correct answer using the codes given below.

(a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

55. With reference to Agni-IV Missile, which of the following statement(s) is/are correct?

1. It is surface-to-surface missile.
2. It is fuelled by liquid propellant only.
3. It can deliver one tonne nuclear warhead about 7500 km away.

Select the correct answer using the codes given below.

(a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

56. With reference to technologies for solar power production, consider the following statements:

1. 'Photovoltaics' is a technology that generates electricity by direct conversion of light into electricity, while 'Solar Thermal' is a technology that utilizes the Sun's rays to generate heat which is further used in electricity generation process.
2. Photovoltaics generate Alternating Current (AC), while solar Thermal generates Direct Current (DC).
3. India has manufacturing base for Solar Thermal technology, but not for Photovoltaics.

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

(a) 1 only

(b) 2 and 3 only

(c) 1, 2 and 3

(d) None

57. Brominated flame retardants are used in many household products like mattresses and upholstery. Why is there some concern about their use?

1. They are highly resistant to degradation in the environment.
2. They are able to accumulate in humans and animals.

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

58. There is some concern regarding the nanoparticles of some chemical elements that are used by the industry in the manufacture of various products. Why?

1. They can accumulate in the environment, and contaminate water and soil.
2. They can enter the food chains.
3. They can trigger the production of free radicals.

Select the correct answer using the codes given below:

(a) 1 and 2 only

(b) 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

59. In India, cluster bean (Guar) is traditionally used as a vegetable or animal

feed, but recently the cultivation of this has assumed significance. Which one of the following statements is correct in this context?

(a) The oil extracted from seeds is used in the manufacture of biodegradable plastics

(b) The gum made from its seeds is used in the extraction of shale gas

(c) The leaf extract of this plant has the properties of anti-histamines

(d) It is a source of high quality biodiesel

60. With reference to two non-conventional energy sources called ‘coalbed methane’ and ‘shale gas’, consider the following statements:

1. Coalbed methane is the pure methane gas extracted from coal seams, while shale gas is a mixture of propane and butane only that can be extracted from fine-grained sedimentary rocks.
2. In India, abundant coalbed methane sources exist, but so far no shale gas sources have been found.

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

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

61. In addition to fingerprint scanning, which of the following can be used in the biometric identification of a person?

1. Iris scanning
2. Retinal scanning
3. Voice recognition

Select the correct answer using the code given below.

(a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

2013

62. Which of the following adds/add nitrogen to the soil?

1. Excretion of urea by animals
2. Burning of coal by man
3. Death of vegetation

Select the correct answer using the codes given below:

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

63. Consider the following animals:

1. Sea cow
2. Sea horse
3. Sea lion

Which of the above is/are mammal/mammals?

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

64. Improper handling and storage of cereal grains and oilseeds result in the production of toxins known as aflatoxins which are not generally destroyed by normal cooking process. Aflatoxins are produced by

- (a) Bacteria

- (b) Protozoa
- (c) Moulds
- (d) Viruses

65. Which of the following diseases can be transmitted from one person to another through tattooing?

1. Chikungunya
2. Hepatitis B
3. HIV-AIDS

Select the correct answer using the codes given below:

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

66. Consider the following organisms:

1. Agaricus
2. Nostoc
3. Spirogyra

Which of the above is/are used as biofertilizer/biofertilizers?

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

67. Which of the following statements is/are correct

1. Viruses lack enzymes necessary for the generation of energy.
2. Viruses can be cultured in any synthetic medium.

3. Viruses are transmitted from one organism to another by biological vectors only.

Select the correct answer using the codes given below.

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

68. Consider the following minerals:

- 1. Calcium
- 2. Iron
- 3. Sodium

Which of the minerals given above is/are required by human body for the contraction of muscles?

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

69. Fruits stored in a cold chamber exhibit longer storage life because

- (a) exposure to sunlight is prevented
- (b) concentration of carbon dioxide in the environment is increased
- (c) rate of respiration is decreased
- (d) there is an increase in humidity

70. The known forces of nature can be divided into four classes, viz. gravity, electromagnetism, weak nuclear force and strong nuclear force. With reference to them, which one of the following statements is not correct?

- (a) Gravity is the strongest of the four

- (b) Electromagnetism acts only on particles with an electric charge
- (c) Weak nuclear force causes radioactivity
- (d) Strong nuclear force holds protons and neutrons inside the nucleus of an atom

71. Consider the following phenomena:

1. Size of the sun at dusk
2. Colour of the sun at dawn
3. Moon being visible at dawn
4. Twinkle of stars in the sky
5. Polestar being visible in the sky

Which of the above are optical illusions?

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

72. Due to improper/indiscriminate disposal of old and used computers or their parts, which of the following are released into the environment as e-waste?

1. Beryllium
2. Cadmium
3. Chromium
4. Heptachlor
5. Mercury
6. Lead
7. Plutonium

Select the correct answer using the codes given below:

- (a) 1, 3, 4, 6 and 7 only
- (b) 1, 2, 3, 5 and 6 only
- (c) 2, 4, 5 and 7 only

(d) 1, 2, 3, 4, 5, 6 and 7

73. The efforts to detect the existence of Higgs boson particle have become frequent news in the recent past. What is/are the importance (s) of discovering this particle?

1. It will enable us to understand as to why elementary particles have mass.
2. It will enable us in the near future to develop the technology of transferring matter from one point to another without traversing the physical space between them.
3. It will enable us to create better fuels for nuclear fission.

Select the correct answer using the codes given below.

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

74. Many transplanted seedlings do not grow because

- (a) the new soil does not contain favourable minerals
- (b) most of the root hairs grip the new soil too hard
- (c) most of the root hairs are lost during transplantation
- (d) leaves get damaged during transplantation

75. Recombinant DNA technology (Genetic Engineering) allows genes to be transferred

1. Across different species of plants
2. From animals to plants
3. From microorganisms to higher organisms

Select the correct answer using the codes given below.

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

(c) 1 and 3 only

(d) 1, 2 and 3

76. Mycorrhizal biotechnology has been used in rehabilitating degraded sites because mycorrhiza enables the plants to

1. resist drought and increase absorptive area
2. tolerate extremes of pH
3. resist disease infestation

Select the correct answer using the codes given below.

(a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

2012

77. Consider the following kinds of organisms:

1. Bat
2. Bee
3. Bird

Which of the above is/are pollinating agent/agents?

(a) 1 and 2 only

(b) 2 only

(c) 1 and 3 only

(d) 1, 2 and 3

78. Consider the following statements:

If there were no phenomenon of capillarity

1. It would be difficult to use a kerosene lamp
2. One would not be able to use a straw to consume a soft drink
3. The blotting paper would fail to function
4. The big trees that we see around would not have grown on the earth

Which of the following statements given above are correct?

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

79. Graphene is frequently in news recently. What is its important?

1. It is a two dimensional material and has good electrical conductivity.
2. It is one of the thinnest but strongest materials tested so far.
3. It is entirely made of silicon and has high optical transparency.
4. It can be used as 'conducting electrodes' requires for touch screens, LCD's and organic LED's

Which of the statements given above are correct?

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

80. Which of the following is/are cited by the scientists as evidence/evidences for the continued expansion of universe?

1. Detection of microwaves in space
2. Observation of redshift phenomenon in space
3. Movement of asteroids in space
4. Occurrence of supernova explosions in space code

- (a) 1 and 2 only

- (b) 2 only
- (c) 1, 3 and 4
- (d) None of the above

81. Electrically charged particles from space travelling at speeds of several hundred km/sec can severely harm living beings if they reach the surface of the earth. What prevents them from reaching the surface of the earth?

- (a) The Earth's magnetic field diverts them toward its poles
- (b) Ozone layer around the Earth reflects them back to outer space
- (c) Moisture in the upper layers of atmosphere prevents them from reaching the surface of the Earth
- (d) None of the statements (a),(b) and (c) is correct.

82. Lead, ingested or inhaled, is a health hazard. After the addition of lead to petrol has been banned, what still are the sources of lead poisoning?

1. Smelting units
2. Pens pencils
3. Paints
4. Hair oils and cosmetics

Select the correct answer using the codes given below:

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

83. What is the role of ultraviolet (UV) radiation in the water purification systems?

1. It inactivates/kills the harmful microorganisms in water.
2. It removes all the undesirable odours from the water

3. It quickens the sedimentation of solid particles, removes turbidity and improves the clarity of water.

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

84. Other than resistance to pests, what are the prospects for which genetically engineered plants have been created?

- (a) To enable them to withstand drought
- (b) To increase the nutritive value of the produce
- (c) To enable them to grow and do photosynthesis in spaceships and space stations
- (d) To increase their shelf life

85. Which one of the following sets of elements was primarily responsible for the origin of life on the Earth?

- (a) Hydrogen, Oxygen, Sodium
- (b) Carbon, Hydrogen, Nitrogen
- (c) Oxygen, Calcium, Phosphorous
- (d) Carbon, Hydrogen, Potassium

86. Consider the following kinds of organisms:

1. Bacteria
2. Fungi
3. Flowering plants

Some species of which of the above kinds of organisms are employed as bio pesticides?

- (a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

87. A team of scientists at Brookhaven National Laboratory including those from India created the heaviest anti matter (anti helium nucleus) What is/are the implications of the creation of anti matter?

1. It will make mineral prospecting and oil exploration easier and cheaper.
2. It will help probe the possibility of the existence of stars and galaxies made of anti matter.
3. It will help understand the evolution of the universe.

Select the correct answer using the codes given below:

(a) 1 only

(b) 2 and 3 only

(c) 3 only

(d) 1, 2 and 3

88. To meet its rapidly growing energy demand, some opine that India should pursue research and development on thorium as the future fuel of nuclear energy. In this context, what advantage does thorium hold over uranium?

1. Thorium is far more abundant in nature than uranium.
2. On the basis of unit mass of mined mineral, thorium can generate more energy compared to natural uranium
3. Thorium produces less harmful waster compared to uranium.

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

(a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

89. Recently, there has been a concern over the short supply of a group of elements called 'rare earth metals'. Why?

1. China, which is the largest producer of these elements, has imposed some restrictions on their export.
2. Other than China, Australia, Canada and Chile, these elements are not found in any country.
3. Rare earth metals are essential for the manufacture of various kinds of electronic items and there is a growing demand for these elements.

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

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

90. With reference to 'stem cells', frequently in the news, which of the following statement(s) is/are correct?

1. Stem cells can be derived from mammals only.
2. Stem cells can be used for screenings new drugs.
3. Stem cells can be used for medical therapies.

Select the correct answer using the codes given below.

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

91. What are the reasons for the people's resistance to the introduction of Bt brinjal in India?

1. Bt brinjal has been created by inserting a gene from a soil funguns into its genome.

2. The seeds of Bt brinjal are terminator seeds and therefore, the farmers have to buy the seeds before every season from the seed companies.
3. There is an apprehension that the consumption of Bt-brinjal may have adverse impact on health.
4. There is some concern that the introduction of Bt-brinjal may have adverse effect on the biodiversity.

Select the correct answer using the codes given below:

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

92. Biomass gasification is considered to be one of the sustainable solutions to the power crisis in India. In this context, which of the following statement(s) is/are correct?

1. Coconut shells, groundnut shells and rice husk can be used in biomass gasification.
2. The combustible gases generated from biomass gasification consist of hydrogen and carbon dioxide only.
3. The combustible gases generated from biomass gasification can be used for direct heat generation, but not in internal combustion engines.

Select the correct answer using the codes given below:

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

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93. Consider the following:

1. Photosynthesis

2. Respiration
3. Decay of organic matter
4. Volcanic eruption

Which of the above add carbon dioxide to the carbon cycle on earth?

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

94. The surface of a lake is frozen in severe winter, but the water at its bottom is still liquid. What is reason?

- (a) Ice is a bad conductor of heat.
- (b) Since the surface of the lake is at the same temperature as the air, no heat is lost.
- (c) The density of water is Maximum at 4 degree Celsius.
- (d) None of the above

95. Regular intake of fresh fruits and vegetables is recommended in the diet since they are a good source of antioxidants .How do antioxidants help a person maintain health and promote longevity?

- (a) They activate the enzymes necessary for vitamin synthesis in the body and help prevent vitamin deficiency.
- (b) They prevent excessive oxidation of Carbohydrates, fats and proteins in the body and avoid unnecessary wastage of energy.
- (c) They neutralize the free radicals produced in the body during metabolism.
- (d) They activate certain genes in the cells of the body and help delay the ageing process.

96. A company marketing food products advertises that its items do not contain trans-fats. What does this campaign signify to the customers?

1. The food products are not made out of hydrogenated oils.

2. The food products are not made out of animal fats.
3. The oils used are not likely to damage the cardiovascular health of consumers.

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

97. Aspartame is an artificial sweetener sold in the market. It consist of amino acids and provides calories like other amino acids. Yet, it is used as a low - calorie sweetening agent in food items. What is the basis of this use?

- (a) Aspartame is as sweet as table sugar, but unlike table sugar, it is not readily oxidized in human body due to lack of requisite enzymes.
- (b) When aspartame is used in food processing, the sweet taste remains, but it becomes resistant to oxidation.
- (c) Aspartame is as sweet as sugar, but after ingestion into the body, it is converted into metabolites that yield no calories.
- (d) Aspartame is several times sweeter than table sugar, hence food items made with small quantities of aspartame yield fewer calories on oxidation.

98. A married couple adopted a male child. A few years later, twin boys were born to them. The blood group of the couple is AB positive and O negative. The blood group of the three sons is A positive, B positive , and O positive. The blood group of the adopted son is ?

- (a) O Positive
- (b) A Positive
- (c) B Positive
- (d) Cannot be determined on the basis of the given data

99. What is difference between asteroids and comets?

1. Asteroids are small rocky plane toids, while comets are formed of frozen gases held together by rocky and metallic material.
2. Asteroids are found mostly between the orbits of Jupiter and Mars, while comets are found mostly between Venus and mercury.
3. Comets show a perceptible glowing tail, while asteroids do not.

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

100. When the bark of a tree is removed in a circular fashion all around near its base, it gradually dries up and dies because

- (a) Water from soil cannot rise to aerial parts.
- (b) Roots are starved of energy.
- (c) Tree is infected by soil microbes.
- (d) Roots do not receive oxygen for respiration.

101. A layer in the Earth's atmosphere called ionosphere facilities radio communication. Why?

1. The presence of ozone causes the reflection of radio waves to earth.
2. Radio waves have a very long wavelength.

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

102. What is the difference between a CFL and an LED lamp?

1. To produce light, a CFL uses mercury vapour and phosphor while an LED lamp uses semi-conductor material.
2. The average life span of a CFL is much longer than that of an LED lamp.
3. A CFL is less energy-efficient as compared to an LED lamp.

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

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

103. What is the difference between Bluetooth and Wi-Fi devices?

- (a) Bluetooth uses 2.4 GHz radio frequency band, whereas Wi-Fi can use 2.4 GHz or 5 GHz frequency band
- (b) Bluetooth is used for Wireless Local Area Networks (WLAN) only, whereas Wi-Fi is used for Wireless Wide Area Networks (WWAN) only
- (c) When information is transmitted between two devices using Bluetooth technology, the devices have to be in the line of sight of each other, but when Wi-Fi technology is used the devices need not be in the line of sight of each other
- (d) The statement (a) and (b) given above are correct in this context

104. What is “Virtual Private Network”?

- (a) It is a private computer network of an organization where the remote users can transmit encrypted information through the server of the organization
- (b) It is a computer network across a public internet that provides users access to their organization’s network while maintaining the security of the information transmitted
- (c) It is a computer network in which users can access a shared pool of computing resources through a service provider

(d) None of the statements (a), (b) and (c) given above is a correct description of Virtual Private Network

105. A new optical disc format known as the Blue-ray Disc (BD) is becoming popular. In what way is it different from the traditional DVD?

1. DVD supports Standard Definition video while BD supports High Definition video.
2. Compare to a DVD, the BD format has several times more storage capacity.
3. Thickness of BD is 2-4 mm while that of DVD is 1.2 mm.

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

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

106. Recently, “oilzapper” was in the news. What is it?

- (a) It is an eco-friendly technology for the remediation of oily sludge and oil spills
- (b) It is the latest technology developed for under-sea oil exploration
- (c) It is genetically engineered high biofuel-yielding maize variety
- (d) It is the latest technology to control the accidentally caused flames from oil wells

107. At present, scientists can determine the arrangement or relative positions of genes or DNA sequences on a chromosome. How does this knowledge benefit us?

1. It is possible to know the pedigree of livestock
2. It is possible to understand the causes of all human diseases.
3. It is possible to develop disease resistant animal breeds.

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

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

(c) 1 and 3 only

(d) 1, 2 and 3

108. Microbial fuel cells are considered a source of sustainable energy. Why?

1. They use living organisms as catalysts to generate electricity from certain substrates.
2. They use a variety of inorganic materials as substrates.
3. They can be installed in waste water treatment plants to cleanse water and produce electricity.

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

(a) 1 only

(b) 2 and 3 only

(c) 1 and 3 only

(d) 1, 2 and 3

109. A genetically engineered form of brinjal, known as the Bt brinjal, has been developed. The objective of this is

(a) To make it pest-resistant

(b) To improve its taste and nutritive qualities

(c) To make it drought-resistant

(d) To make its shelf-life longer

110. The function of heavy water in a nuclear reactor is to

(a) Slow down the speed of neutrons

(b) Increase the speed of neutrons

(c) Cool down the reactor

(d) Both (a) and (c)

111. An artificial satellite orbiting around the Earth does not fall down. This is

so because the attraction of Earth

- (a) does not exist at such distance
- (b) is neutralized by the attraction of the moon
- (c) provides the necessary speed for its steady motion
- (d) provides the necessary acceleration for its motion

112. Consider the following:

1. Carbon dioxide
2. Oxides of Nitrogen
3. Oxides of Sulphur

Which of the above is/are the emission/emissions from coal combustion at thermal power plants?

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

113. Satellites used for telecommunication relay are kept in a geostationary orbit. A satellite is said to be in such as orbit when:

1. The orbit is geosynchronous.
2. The orbit is circular.
3. The orbit lies in the plane of the earth's equator.
4. The orbit is at an altitude of 22,236 km.

Select the correct answer using the codes given below:

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