



Fact Sheet Prep Series Part - 11

ANSWER KEY WITH EXPLANATION

GENERAL SCIENCE

(PART - II)

1. Ans. a

Explan - Methamphetamine (contracted from N-methyl amphetamine) is a strong central nervous system (CNS) stimulant that is mainly used as a recreational drug and less commonly as a treatment for attention deficit hyperactivity disorder and obesity. Methamphetamine was discovered in 1893 and exists as two enantiomers: dextromethamphetamine and levomethamphetamine. Methamphetamine properly refers to a specific chemical, the racemic free base, which is an equal mixture of levomethamphetamine and dextromethamphetamine in their pure amine forms. It is rarely prescribed due to concerns involving human neurotoxicity and potential for recreational use as an aphrodisiac and euphoriant, among other concerns, as well as the availability of safer substitute drugs with comparable treatment efficacy. Dextromethamphetamine is a much stronger central stimulant than levomethamphetamine. Both enantiomers are neurotoxic and addictive.

2. Ans. d

Related Information - Hemp is used in all three industries for a number of reason and to make a number of products. It is an essential ingredient in the production of products from these industries.

3. Ans. c

Explan - In the case of fires caused by oil or petrol, sprinkling water is not effective since oil/petrol being lighter than water floats on the surface of water and continues to burn.

4. Ans. d

Explan - In deliquescence, solid substances absorb water vapor from the atmosphere and are slowly transformed into liquids which are solutions of such solids in water. In chemistry, efflorescence is the migration of a salt to

the surface of a porous material, where it forms a coating. The essential process comprises the dissolving of an internally-held salt in water, or occasionally in another solvent. The water, with the salt now held in solution, migrates to the surface, and then evaporates, leaving a coating of the salt. The resulting substances are fluffy and rough solids.

5. Ans. c

Explan - Since Agni-1 belongs to Ballistic missiles class, it cannot be programmed with a terrain-following system or use GPS to maintain a particular flight path. Only missiles belonging to Cruise missile category can be programmed. Ballistic missile follows a ballistic trajectory path (no planned change in flight path) and flight path is in an arc (parabolic)

6. Ans. d

Explan - Indian intelligence agencies have found a new app called "Calculator" which is used by terrorists. This application is found on the Smartphone of terrorists. It helps them remain in touch with their handlers in Pakistan-occupied Kashmir (PoK) without being detected by the Army's technical surveillance.

7. Ans. d

8. Ans. c

Explan - The move to set up additional radar assumes significance as the eastern coast is prone to cyclones and better forecast will help authorities in taking timely action. Gopalpur had faced the severe cyclonic storm Phailin in October 2013. The India Meteorological Department (IMD) had in November 2015 installed a doppler radar in Paradip, another coastal district in Odisha which was ravaged by a super cyclone in 1999

This radar uses the Doppler Effect to produce velocity



data about objects at a distance. It does this by bouncing a microwave signal off a desired target and analyzing how the object's motion has altered the frequency of the returned signal. This variation gives direct and highly accurate measurements of the radial component of a target's velocity relative to the radar.

9. Ans. b

Explan - Red biotechnology is applied to medical processes. Some examples are the designing of organisms to produce antibiotics, and the engineering of genetic cures through genetic manipulation. White biotechnology, also known as industrial biotechnology, is biotechnology applied to industrial processes. An example is the designing of an organism to produce a useful chemical.

10. Ans. d

11. Ans. d

12. Ans. d

13. Ans. b

Explan - Neutrinos have a small, but non-zero mass. Neutrinos are subatomic particles produced by the decay of radioactive elements and are elementary particles that lack an electric charge. They travel nearly with the speed of light.

14. Ans. d

Explan - Bio-concentration is the process where the chemical concentration in an aquatic organism achieves a level that exceeds that in the water as a result of the exposure of an organism to a chemical in the water but does not include exposure via the diet. Bio-concentration happens at the same trophic level. It is biomagnifications that is related to increase in chemical within different trophic levels. Bioaccumulation can happen via any route including dietary.

15. Ans. d

Explan - High frequency sound waves reflect from flaws in predictable ways, producing distinctive echo patterns that can be displayed and recorded by portable instruments. Ultrasonic testing is completely nondestructive and safe, and it is a well established test method in many basic manufacturing, process, and service industries, especially in applications involving welds and structural metals.

Adding high powered sound waves to traditional cleaning methods can increase removal of *E. coli* and other harmful bacteria by 70 to 90 per cent.

It isn't exactly clear why ultrasound stimulates plant growth. Evidence seems to support the theory that the sound acts as a catalyst, activating the production of plant hormones called auxins.

16. Ans. b

Explan - Enteric fermentation in cattle produces methane and not carbon monoxide. Carbon monoxide (CO) is a deadly, colorless, odorless, poisonous gas. It is produced by the incomplete burning of various fuels, including coal, wood, charcoal, oil, kerosene, propane, and natural gas. Products and equipment powered by internal combustion engines such as portable generators, cars, lawn mowers, and power washers also produce CO.

17. Ans. b

Explan - Recombinant DNA is a combination of DNA from different organisms or different locations in a given genome that would not normally be found in nature.

In most cases, use of recombinant DNA means it is added with an extra gene to an organism to alter a trait or add a new trait.

The organism that is modified in a genetic engineering experiment is referred to as the host. Depending on the goal of the genetic engineering experiment, the host could range from a bacterial cell to a plant or animal cell or even a human cell. It might be guessed that scientists chose a human or animal cell to produce insulin. If so, it might be surprised to discover that scientists instead used bacterial cells to produce human insulin.

There are many reasons why bacteria play an important role in many genetic engineering experiments. Consider the space required to house larger animals. Bacteria are small and relatively inexpensive to maintain compared to most alternatives. Consider the time required to raise larger animals. Bacteria reproduce much more rapidly. Finally, consider the end-goal. It is easier to over express and isolate molecules from a bacterial cell than it is from specific cells in a multi-cellular host.

18. Ans. d

Related Information - Transmission over an optical fiber cable requires repeaters at distance intervals. The glass fiber requires more protection within an outer cable than copper. For these reasons and because the installation of any new cabling is labor-intensive, few communities have installed optical fiber cables from the phone company's branch office to local customers (known as local loops). A type of fiber known as single mode fiber is used for longer distances; multimode fiber is used for shorter distances.

Fiber optics has several advantages over traditional metal communications lines:

- Fiber optic cables have a much greater bandwidth than metal cables. This means that they can carry more data.
- Fiber optic cables are less susceptible than metal



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cables to interference.

- Fiber optic cables are much thinner and lighter than metal wires.
- Data can be transmitted digitally (the natural form for computer data) rather than analogically.

The main disadvantage of fiber optics is that the cables are expensive to install. In addition, they are more fragile than wire and are difficult to splice.

Fiber optics is a particularly popular technology for local-area networks. In addition, telephone companies are steadily replacing traditional telephone lines with fiber optic cables. In the future, almost all communications will employ fiber optics.

19. Ans. c

Explan - The term is largely believed to have been coined in 1919 by Hungarian engineer Károly Ereky. The wide concept of “biotech” or “biotechnology” encompasses a wide range of procedures for modifying living organisms according to human purposes, going back to domestication of animals, cultivation of plants, and “improvements” to these through breeding programs that employ artificial selection and hybridization. Modern usage also includes genetic engineering as well as cell and tissue culture technologies. The American Chemical Society defines biotechnology as the application of biological organisms, systems, or processes by various industries to learning about the science of life and the improvement of the value of materials and organisms such as pharmaceuticals, crops, and livestock. As per European Federation of Biotechnology, Biotechnology is the integration of natural science and organisms, cells, parts thereof, and molecular analogues for products and services. Biotechnology also writes on the pure biological sciences (animal cell culture, biochemistry, cell biology, embryology, genetics, microbiology, and molecular biology). In many instances, it is also dependent on knowledge and methods from outside the sphere of biology including:

- Bioinformatics, a new brand of computer science
- Bioprocess engineering
- Biorobotics
- Chemical engineering

Conversely, modern biological sciences (including even concepts such as molecular ecology) are intimately entwined and heavily dependent on the methods developed through biotechnology and what is commonly thought of as the life sciences industry. Biotechnology is the research and development in the laboratory using bioinformatics for exploration, extraction, exploitation

and production from any living organisms and any source of biomass by means of biochemical engineering where high value-added products could be planned (reproduced by biosynthesis, for example), forecasted, formulated, developed, manufactured and marketed for the purpose of sustainable operations (for the return from bottomless initial investment on R & D) and gaining durable patents rights (for exclusives rights for sales, and prior to this to receive national and international approval from the results on animal experiment and human experiment, especially on the pharmaceutical branch of biotechnology to prevent any undetected side-effects or safety concerns by using the products).

By contrast, bioengineering is generally thought of as a related field that more heavily emphasizes higher systems approaches (not necessarily the altering or using of biological materials directly) for interfacing with and utilizing living things. Bioengineering is the application of the principles of engineering and natural sciences to tissues, cells and molecules. This can be considered as the use of knowledge from working with and manipulating biology to achieve a result that can improve functions in plants and animals. Relatedly, biomedical engineering is an overlapping field that often draws upon and applies biotechnology (by various definitions), especially in certain sub-fields of biomedical and/or chemical engineering such as tissue engineering, biopharmaceutical engineering, and genetic engineering.

20. Ans. a

Explan - Lead poisoning occurs when lead builds up in the body, often over a period of months or years. Even small amounts of lead can cause serious health problems. At very high levels, lead poisoning can be fatal.

Adults who work with batteries, do home renovations or work in auto repair shops also may be exposed to lead.

While treatment is available for lead poisoning, taking some simple precautions can help protect yourself and your family.

Symptoms

Initially, lead poisoning can be hard to detect - even people who seem healthy can have high blood levels of lead. Signs and symptoms usually don't appear until dangerous amounts have accumulated.

The signs and symptoms of lead poisoning in children may include:

- Developmental delay
- Learning difficulties
- Irritability



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- Loss of appetite
- Weight loss
- Sluggishness and fatigue
- Abdominal pain
- Vomiting
- Constipation
- Hearing loss

Lead poisoning symptoms in newborns: Babies who are exposed to lead before birth may experience:

- Learning difficulties
- Slowed growth

Lead poisoning symptoms in adults: Although children are primarily at risk, lead poisoning is also dangerous for adults. Signs and symptoms in adults may include:

- High blood pressure
- Abdominal pain
- Constipation
- Joint pains
- Muscle pain
- Declines in mental functioning
- Pain, numbness or tingling of the extremities
- Headache
- Memory loss
- Mood disorders
- Reduced sperm count, abnormal sperm
- Miscarriage or premature birth in pregnant women

21. Ans. b

Explain - A geosynchronous orbit is a geocentric orbit that has the same orbital period as the sidereal rotation period of the Earth.

It has a semi-major axis of 42,164 km (26,200 miles).

In the special case of the geostationary orbit, an observer on the ground would not perceive the satellite as moving and would see it as a fixed point in the sky

In the more general case, when the orbit has some inclination and/or eccentricity, the satellite would appear to describe a more or less distorted figure-eight in the sky, and would rest above the same spots of the Earth's surface once per sidereal day.

Most inner moons of planets have synchronous rotation, so their synchronous orbits are, in practice, limited to their leading and trailing Lagrange points.

Objects with chaotic rotations (such as Hyperion) are also problematic, as their synchronous orbits keep changing unpredictably.

If a geosynchronous orbit is circular and equatorial then it is also a geostationary orbit, and will maintain the same position relative to the Earth's surface.

If one could see a satellite in geostationary orbit, it would appear to hover at the same point in the sky, i.e., not exhibit diurnal motion, while one would see the Sun, Moon, and stars traverse the heavens behind it.

22. Ans. a

Related Information - The centre was launched to curb rising menace of cybercrimes.

The research centre will train students in areas of cyber security and enhance their capability to provide solution for issues related with cyber security.

It will also support the government in protecting critical infrastructure and mission critical services. The centre will research on malwares such as botnet and will be setting up malware analysis test bed.

The research centre will train students in areas of cyber security and enhance their capability to provide solution for issues related with cyber security.

23. Ans. a

Explain - Xeno-transplantation is the transfer of living cells, tissues and/or organs from non-human animal species into humans. There is a worldwide shortage of supply of organs for clinical transplantation, and many people die waiting for organs to become available. The development of xeno-transplantation can be seen as serving several purposes: to be a complete substitute for human organs; to supplement human organs, thus easing the current shortage available for transplantation; or to be a "bridge" organ before a "destination" organ can be found.

24. Ans. d

25. Ans. b

Explain - India's first Polar Remotely Operated Vehicle (PROVe) was successfully operationalized for research in North Antarctica on 25 March 2015. PROVe has been indigenously built by National Institute of Ocean Technology (NIOT) under the Union Ministry of Earth Sciences. Union Minister for Earth Sciences Harsh Vardhan made the symbolic launch of the PROVe from the National Institute of Ocean Technology (NIOT) headquarters in Chennai.

The results of PROVe's findings will contribute vastly to mankind's understanding of climate besides enhancing the capability to predict the Monsoon.

What will PROVe do?

- Monsoon prediction and reading of pattern will become easier.
- It will measure parameters like ocean currents,



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temperature and salinity in the Arctic

- It is capable of probing the sea bed under normal temperature and is capable of exploring up to 200 meters in inhospitable and tough regions like the ice clad Antarctica.

PROVe was successfully deployed in Priyadarshini Lake located on the Schirmacher Oasis of Antarctica by ESSO-NIOT. The Priyadarshini Lake is a major source of water for Maitri, India's second base in the Antarctica.

Country's first multi-sensor moored observatory IndARC was successfully deployed in Kongsfjorden Fjord of the Arctic roughly halfway between North Pole and Norway on July 23, 2014.

26. Ans. b

Explan - About 40% of all the drugs used throughout the world have active ingredients extracted from plants and animals. For example quinine is used to treat malaria (from the cinchona tree); Digitalis is used to treat chronic heart trouble (from the foxglove plant, *Cinchona officinalis*); and morphine and cocaine are used to reduce pain; drug for leukemia from *Vinca rosea*, taxol from *Taxus brevifolia* etc; and hundreds of life saving antibiotics.

27. Ans. d

28. Ans. d

29. Ans. d

30. Ans. d

31. Ans. b

Explan - In India, VBDs affecting people include malaria, dengue, Japanese encephalitis, kala-azar, lymphatic filariasis and chikungunya. People suffering from diabetes are more susceptible to VBDs because of the fact that high blood sugar in their bodies (resulting in high susceptibility), and lower levels of immunity, makes them more prone to VBDs.

32. Ans. c

Explan - The properties are:

- Water insoluble and relatively resistant to hydrolytic degradation.
- Good oxygen permeability.
- Good ultra-violet resistance but poor resistance to acids and bases.
- Soluble in chloroform and other chlorinated hydrocarbons.
- Nontoxic.
- Less 'sticky' when melted, making it a potentially good material for clothing in the future.

33. Ans. a

Explan - ADVANTAGES -

- Simpler dosage schedule improves compliance and therefore improves treatment outcomes.

- Reduces inadvertent medication errors.
- Allows for synergistic combinations.
- Eliminates drug shortages by simplifying drug storage and handling, and thus lowers risk of being "out of stock".
- Procurement, management and handling of drugs is simplified.
- Side effects are reduced by using one drug of the combination for this purpose.
- Potential for drug abuse can be minimized by using one drug of the combination for this purpose.

34. Ans. a

Explan - It is all about vitamin A.

35. Ans. b

36. Ans. d

37. Ans. c

Explan - Bacteria, algae and green plants are autotrophs that produce their own food.

38. Ans. a

39. Ans. b

40. Ans. d

41. Ans. b

Explan - Mosquitoes and other blood sucking insects cannot transmit AIDS because the HIV causing AIDS does not replicate inside mosquito, bed bug, flea or other blood sucking insects and the lack of replication of HIV in arthropod cells is due to lack of T antigen on cell surface.

42. Ans. c

43. Ans. a

44. Ans. b

Explan - Dromedary camels aged less than four years might be a major source of Middle East Respiratory Syndrome (MERS) virus, as per a recent study. The findings of the study were published in the journal Emerging Infectious Diseases in June 2015. The research study was carried out by international team who had looked for evidence of current or past MERS infection in more than 800 dromedary camels or Arabian camels. Changes in animal husbandry may reduce the occurrence of human MERS infections.

45. Ans. b

Explan - MADAD is a collaborative effort of the Ministry of External Affairs (MEA) and the Ministry of Overseas Indian Affairs (MOIA) to extend a helping hand to Indians abroad requiring consular assistance.

46. Ans. c

Explan - Carbon dioxide is not ozone depleting gas.

47. Ans. d

48. Ans. d

Explan - Pongamia Pinnata is a viable non-toxic alternative to jatropha for making biodiesel. Being a legume, it fixes nitrogen into the soil and is often used as a windbreak between fields on farms. Bio Diesel fuel can be produced from oilseed plants such as rape seeds, sunflower, canola and or JATROPHA CURCAS.

49. Ans. b

Explan - Graphite is a good conductor of heat and electricity.

50. Ans. c

Explan - Like intravenous immunoglobulin therapy, ZMapp contains neutralizing antibodies that provide passive immunity to the virus by directly and specifically reacting with it.



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