

## WBCS (Main) Exam. Paper – IV Practice Set

### Answers with Explanation

1. (b) Electroencephalography (EEG) is the recording of electrical activity along the scalp. EEG measures voltage fluctuations resulting from ionic current flows in neurons of the brain. Electrocardiography (ECG) is a transthoracic interpretation of the electrical activity of the heart over a period of time detected by electrodes attached to the surface of the skin and recorded external device. Electrooculography (EOG) is a technique of measuring the corneoretinal standing potential existing between the front and the back of the human eye. Electromyography (EMG) is a technique for evaluating physiologic properties of muscles. শ্রীচিওর্স
2. (d) Plague is a deadly infectious disease, caused by the enterobacteria *Yersinia pestis*. Until 2007, plague, yellow fever, and cholera were the three epidemic diseases reported to WHO. AIDS is caused by human immunodeficiency virus. Baldness can be caused by a fungus *Microsporum audouinii*, a common cause of ringworm and associated hair loss. Malaria is mosquito-borne infectious disease of humans caused by protozoa of genus *Plasmodium*.
3. (a) Werner Arber along with American researchers Hamilton Smith and Daniel Nathans, had won the 1978 Nobel Prize in Physiology or Medicine for the discovery of restriction endonucleases. For the first time, Feldmann and Marks had demonstrated the production of transgenic plants without invitro step. They just grew the *Arabidopsis* seeds with the gene containing *Agrobacterium tumefaciens*. Kary Mullis is the inventor of the technique PCR for in vitro synthesis of DNA fragments. Reverse transcriptase was discovered by Howard Temin and independently isolated by David Baltimore in 1970. শ্রীচিওর্স
4. (c) Humans are diploid with 23 pairs of chromosomes. Of this, 22 pairs are somatic and the one pair is sex chromosomes. This particular pair exists as XX in human females and XY in males. The presence of two X chromosomes contributes to the female phenotype while presence of only one Y chromosome is responsible for the human to be male. Females produce only X-type haploid gametes and males produce two types (X and Y) of haploid gametes. Fusion of either X or Y of male gamete with the female gamete determines the sex of the offspring. শ্রীচিওর্স
5. (d) Essential amino acids or indispensable amino acids are those amino acids which cannot be synthesized de novo by any particular organism. In humans also, some amino acids are essential and must be supplied in the diet. The amino acids regarded as essential for humans are phenylalanine, valine, threonine, tryptophan, methionine, leucine, isoleucine, lysine, and histidine.
6. (b) Washing soda is sodium salt of carbonic acid. It occurs as a crystalline heptahydrate, which on heating loses its water to form a white powder monohydrate. This process is called efflorescence.
 
$$\text{Na}_2\text{CO}_3 \cdot 7\text{H}_2\text{O} \xrightarrow{\text{heat}} \text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O} + 6\text{H}_2\text{O}$$
7. (a) Electron –  $9.1 \times 10^{-31}$  kg  
Proton – 1.00728 u  
Neutron – 1.00867 u
8. (d) Formic acid – Ant's sting শ্রীচিওর্স  
Tartaric acid – Tamarind  
Oxalic acid – Spinach  
Citric acid – Orange
9. (c) In  ${}^{90}_{38}\text{Sr}^{2+}$  :  
Atomic number = no. of protons = 38  
Since it has lost  $e^{2+}$  so no. of electrons = 38 – 2 = 36  
Atomic mass = no. of protons + no. of neutrons  
90 = 38 + no. of neutrons  
90 – 38 = no. of neutrons  
52 = no. of neutrons  
Hence, no. of neutrons = 52, no. of protons = 38.
10. (a) These compounds are used in the manufacture of the following products. Cellulose nitrate- Gun powder, Potassium Sulphate- Fertiliser, Potassium salts of fatty acids- Soft soap, Calcium oxide- Glass. শ্রীচিওর্স
11. (a)
12. (a) Diamond, an allotrope of carbon, has very high

refractive because of which it is used as a gem in jewellery. It is used for cutting glass, marble stones and other hard materials and for drilling of rocks. It is a bad conductor of electricity. It is the hardest material known.

13. (b) Isotopes are variants of a particular chemical element: while all isotopes of a given element share the same number of protons and electrons, each isotope differs from the others in its number of neutrons. For example, carbon-12, carbon-13 and carbon-14 are three isotopes of the element carbon with mass numbers 12, 13 and 14 respectively. The atomic number of carbon is 6, which means that every carbon atom has 6 protons, so that the neutron numbers of these isotopes are 6, 7 and 8 respectively.
14. (a) Goldstein discovered proton, Chadwick Neutron, J. J. Thomson-Electron and John Dalton Atomic Theory. অ্যাডভান্স
15. (a) It inactivates/kills the harmful microorganisms in water.
16. (a) Manganese is essential to iron and steel production. At present, steel making accounts 85 to 90% of the total demand, most of the total demand. Manganese is a key component of low-cost stainless steel formulations and certain widely used aluminium alloys. Limestone can be used in constructing buildings. It can be used for making cement and mortar. Limestone is used to make glass and even used to make roads. Bauxite is the mineral ore of aluminium which is used in the manufacture of cans, airplanes, sporting and electronic equipment and home appliances. The Wright Brother's first airplane to fly in 1903 only was able to get off the ground because they modified its engine with aluminium in order to reduce its weight. Without the ability of the strong aluminium, alloys to withstand the huge pressures and stresses involved, high altitude flying would not be conceivable. In fact, aluminium comprises about 80% of an aircraft's unladen weight. অ্যাডভান্স  
The element copper is used extensively as an electrical conductor, for the making of electrical wire.
17. (d) Nickel silver, also known as German silver, is a copper alloy with nickel and often zinc.

Solders are typically made from tin or lead or a combination of both in the ratio of 63:37 respectively.

Calcium hypochlorite, also known as bleaching powder, is a chemical compound with formula  $\text{Ca}(\text{ClO})_2$ . It is widely used for water treatment and as a bleaching agent. This chemical is considered to be relatively stable and has greater available chlorine than sodium hypochlorite (liquid bleach). অ্যাডভান্স

Hypo solution is the abbreviation for sodium thiosulphate or sodium hyposulphite, a chemical used to fix the image on photographic film after it has been developed.

18. (b) Hard water is not suitable for washing clothes with soap and use in boilers.
19. (a) Potassium bromide is a salt used to make photographic papers and plates and for process engraving. Gunpowder, also known since the late 19th century as black powder, is a mixture of sulphur, charcoal, and potassium nitrate (saltpeter)—with the sulphur and charcoal acting as fuels, while the saltpeter works as an oxidizer. The principal use of potassium sulphate is as a fertilizer.  $\text{K}_2\text{SO}_4$  does not contain chloride, which can be harmful to some crops. Potassium sulphate is preferred for these crops, which include tobacco and some fruits and vegetables. A white, acid, crystalline solid or powder,  $\text{KHC}_4\text{H}_4\text{O}_6$ , used in baking powder, in the tinning of metals, and as a component of laxatives. Also called cream of tartar.
20. (c) Sour milk – Lactic acid  
Vinegar and pickel – Acetic acid অ্যাডভান্স  
Soda water – Carbonic acid  
Apple – Malic acid
21. (c) Cerargyrite, also called Horn Silver, gray, very heavy halide mineral composed of silver chloride ( $\text{AgCl}$ ); it is an ore of silver. Tiny particles of silver iodide are sprayed on a cloud from an aeroplane. The particles attract water drops from the cloud. When they form a drop that is large enough, it starts raining. Zinc phosphide is an inorganic compound that is used in pesticide products as a rodenticide. Zinc oxide is also known as philosopher's wool.
22. (a) Quarks have fractional electric charge values—either  $1/3$  or  $2/3$  times the elementary charge. The positron has an electric charge of  $+1e$ , a spin of  $1/2$ , and has the same mass as an electron.

A neutrino is an electrically neutral, weakly interacting elementary subatomic particle with halfinteger spin. All evidence suggest that neutrinos have mass but that their mass is tiny even by the standards of subatomic particles. Their mass has never been measured accurately. Photon has zero mass and rest energy.

23. (c) Petroleum products are usually grouped into three categories: light distillates (LPG, gasoline, naphtha), middle distillates (kerosene, diesel), heavy distillates and residuum (heavy fuel oil, lubricating oils, wax, asphalt). Hence, the correct option would be: Gasoline, kerosene, diesel.

24. (d) Thunderstorms result from the rapid upward movement of warm, moist air. They can occur inside warm, moist air masses and at fronts. As the warm, moist air moves upward, it cools, condenses, and forms cumulonimbus clouds that can reach heights of over 20 km (12.45 miles). The thunderstorms are associated with the cumulonimbus clouds. These clouds normally form on warm sunny days but they can also be found on cold front. But this question is asking about the Thunder i.e. the sound produced. The lightning generates between 100 million and 1 billion volts of electricity and can heat the air to around 50K°F. The rapid expansion causes the shock waves. Thunder happens because the lightning would heat the air at huge temperatures and the air expands so fast that it make a loud clap of thunder.

25. (b) 26. (c)

27. (d) Refractive index of a medium depends on its nature.

Refractive index ( $\mu$ ) is also given by

$$\mu = \frac{\sin i}{\sin r}$$

where  $i$  = angle of incidence

$r$  = angle of refraction

Thus,  $\mu$  depends on the angle of incidence.

Again,  $\mu = \frac{C_0}{c}$  where  $C_0$  is the velocity of light in vacuum and  $c$  is the velocity in a medium. We know that frequency remains constant when light passes from one medium to other, therefore,

$$\mu = \frac{\lambda_0}{\lambda}$$

The colour of light depends on wavelength.  
28. (a) Properties of different types of magnets are; Artificial magnet- short lived, permanent magnetlong lived, Temporary magnet- induced magnet, earth as a magnet- last for infinitely long period.

29. (d)

30. (c) The multiplier for the given units are as follows:  
Angstrom  $10^{-10}$   
Micron  $10^{-6}$   
Nanometer  $10^{-9}$

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Hence, the order in which the lengths of the given units increase is given by Angstrom, Nanometer, Micron.

Therefore, the correct sequence is 1, 3, 2.

31. (c) The unit of acceleration is metre per sec<sup>2</sup>. The unit of electric current is ampere. The unit of work done is joule. The unit of impulse is newton second.

32. (c) The intersected area of magenta and yellowcoloured circles will have red colour. The intersected area of cyan and magenta coloured circles will have blue colour.

Magenta = Red + Blue

Cyan = Blue + Green

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33. (d) A hydrogen-inflated polythene balloon rises to an altitude up in the atmosphere, it will maintain the same size and shape.

34. (c) The free surface of oil is inclined to the horizontal with larger depth at the rear end as the oil tanker is moving forward with uniform acceleration.

35. (d) Sound waves require material medium to travel. On the surface of the moon, there is no atmosphere. The speed of sound is maximum in solids and minimum in gas medium.

36. (c) A diamond sparkles more than a glass imitation cut to the same shape is only the true statement. The refractive index of diamond 2.42 > glass 1.5.

37. (a) The temperature of a metal wire rises when an electric current is passed through it because collision of metal atoms with each other releases heat energy.

38. (b) Because thermal conductivity of copper is greater than glass.

39. (b) Heat to electrical energy conversion occurs in solar cell. Electric to sound occurs in loud speaker. Mass to heat occurs in nuclear reactor. Chemical to heat and light occurs in fuel burning.

শ্রেণিক্রম

40. (d) Revolver was discovered by Colt. Dynamite was discovered by Alfred Nobel. Law of cooling was discovered by Newton and law of pressure by Pascal.
41. (c) The unit of temperature is kelvin, power is measured in watt, pressure in pascal and force in newton.
42. (a) Wavelength is the distance between two consecutive crests or troughs and 1 angstrom =  $10^{-10}$  m, joule is the unit of energy. Intensity of sound is measured in decibel. Frequency is measured in hertz (Hz).
43. (b) অ্যাডভান্স
44. (c) Jaundice is a result of increased bile pigments in the blood. Defects of heart valves leads to stenosis, in which the blood vessels are narrowed abnormally so, there is abnormal blood sounds.  
Highly allergic infection and inflammation of nose is known as Rhinitis.  
Paralysis is the loss of motor functions due to damage to nervous system. অ্যাডভান্স
45. (c) Phobia is a kind of intense fear from something. e.g., hydrophobia, ailurophobia is fear of cats, astraphobia is fear of thunder and lightning, achluophobia is fear of darkness. Neurosis is less severe than mental illness and is normal to overcome worry, fear, anxiety and feeling of insecurity. This can also develop due to maladaptive habits.  
Hypochondria is a condition in which there is undue concern about health by a person about himself. Insomnia is lack of sleep over many nights.
46. (b) Cigarette smoke contains N-nitrosodimethylene and causes accumulation of toxics in lungs and arteries to block the passages.  
Mustard gas, chemically known as Bis (2-chloroethyl) sulphide, blocks lungs and affects respiration as it is a strong mutagen and Carcinogen. Asbestos affects lungs and pleural membranes as it is made up of tiny fibers that enter into lungs when breathed in. Vinylchloride is an organochloride,  $H_2C = CHCl$  is highly toxic, flammable and carcinogenic and lungs are affected. অ্যাডভান্স
47. (a) Osteoporosis is a disease of bones and cartilage in which there is a reduction in bone tissue mass causing weakness of skeletal bones and fragility. It is caused by excessive resorption of calcium and phosphorous from the bones.
48. (a) NBRI – Lucknow, অ্যাডভান্স  
CPRI – Shimla,  
CRRRI – Cuttack,  
CFRI – Dehradun
49. (a) Ribosomes are the sites of protein synthesis in the cytoplasm of the cells. The RNA template sits in between the two subunits of the ribosomes and the peptide synthesis take place. Intracellular digestion occurs via lysosomes. The mitochondria are the sites of cellular respiration and power house of the cells generating ATPs. The nucleus contains all the genetic materials which get expressed to produce a phenotype thus, making nucleus the controller of the cells.
50. (d) Somatic cells undergo mitosis during the cell cycle. The phase in which the cells undergo division is called M-phase. The first stage of this phase is prophase, the second is metaphase in which the chromosomes come and lie at the equatorial plate. This stage is followed by anaphase in which the sister chromatids separate out and go to the poles. The telophase is the last stage when the cell's cytoplasm is divided to give rise to two daughter cells.
51. (a) The dark reactions of photosynthesis occur in the stroma of the chloroplast. The light reactions occur in the thylakoid membranes or the grana of the chloroplasts. The glycolytic pathways occur in the cytoplasm of the cells. Krebs' cycle or tricarboxylic acid or citric acid cycle occurs in the mitochondria to produce energy through oxidation.
52. (a) Living fossils are those organisms whose close relatives are not living on the earth. Cycas is a living fossil. Zamia pygmaea is endemic to Cuba and is the smallest gymnosperm on the earth. Sequoiadendron giganteum is the tallest coniferous gymnosperm known as redwoods. Canada balsam is obtained from the Abies balsamea (a North American fir) also known as Canada balsam. অ্যাডভান্স
53. (b) In sewage treatment tanks, different aerobic bacteria are used to degrade organic wastes. 'Chlorella' is used as a source of providing oxygen to the bacteria. Chlorella is an attractive food source as it is high in protein and other essential nutrients. Dried Chlorella contains around 45% protein, 20% fat, 20% carbohydrate and pretty good amount of vitamins. Chlorella is a potential plant to be

- used in space flight shuttles for continuous oxygen supply. Chlorellin is an antibiotic obtained from chlorella. অ্যাচিভার্স
54. (c) Selaginella bryopteris, a lithophytic plant, is used as a medicinal plant in India and commonly known as 'Sanjeevani' or one that infuses life. It is very much drought hardy and can remain alive for many years without water. Adiantum is the maiden hair fern. Equisetum or horsetail is a living fossil and the only living genus of class Equisetopsida. Dryopteris is commonly known as wood fern or male fern.
55. (a) Benign tumours are those which do not spread from the site of formation and is not cancerous. They can be operated and treated by removal. Malignant tumours are dangerously cancerous as they spread from the place of formation to other tissues. Neoplasm is a malignant tumour. Cancer of epithelial tissues are called carcinomas. Sarcoma is the cancer developed in bone and cartilage tissues. Lymphomas are the cancers of blood-forming haematopoietic cells. অ্যাচিভার্স
56. (b) Entamoeba histolytica causes amoebiasis, the symptoms of which are chronic diarrhoea to fulminant dysentery. Trypanosoma gambiense causes sleeping sickness in which there are fevers, joint pains, numbness poor coordination and trouble in sleeping. Syphilis is a STD, caused by Treponema pallidum, a spirochete bacterium, Pasteurella pestis causes Bubonic plague, in which the lymph nodes are swollen especially in armpit and groin.
57. (a) Agroforestry involves the practice of growing trees with the cultivated crops on the same field. Hydroponics is a scientific technique of growing plants on soil less artificial liquids or water media that contain the nutrients. The scientific study of fruits and cultivation of fruits comes under the branch of biology known as Pomology. Palynology is the scientific study of pollen grains and spores, live as well as fossilized. অ্যাচিভার্স
58. (c) The site of photosynthesis is the thylakoid membranes of the chloroplasts. The entire mineral uptake by the cells is done via the plasma membrane which is selectively permeable for some minerals and not permeable for most of the substances. The cellular respiration to derive out the energy occurs in the mitochondria. Ribosomes act as the sites for the peptide synthesis. The RNA template sits on the two subunits of the ribosomes to carry out translation. অ্যাচিভার্স
59. (a) Pure capsaicin is a white crystalline powder. Capsaicin is a capsaicinoid which belongs to the alkaloid family. It is present in chili peppers. It is beneficial for heart as it has role in controlling cholesterol. Geraniol is a natural antioxidant. Geraniol has been suggested to help prevent cancer. It is found in coriander, lavender, lemon, lime, nutmeg, oranges. Allicin is an antioxidant found in garlic and is effective against cancers. Lycopene is a carotenoid present in tomatoes. It is a very efficient antioxidant, which can neutralize oxygen-derived free radicals.
60. (c) In the flower, the ovules undergo fertilization by fusing the egg with the pollen. These then develop into seeds nestling the small embryo inside. The ovary swells to become the fleshy fruit. The wood in trees is the result of secondary growth of the outer layers of stem by cell divisions. The leaves are the site of photosynthesis and the photosynthates (the sugars are converted into starch) are stored in the form of starch. অ্যাচিভার্স
61. (c) Hugo de Vries introduced the term mutation and developed the mutation theory of evolution. Darwin had given the theory of evolution. One gene one enzyme hypothesis was an idea which said that one gene is responsible for producing one enzyme only. This was proposed by Beadle and Tatum in 1941. The concept of Operon was given by Jacob and Monod in 1961.
62. (a) Cardiologist cures heart diseases. Nephrologist cures kidney. Urologist cures urinary tract ailments. Oculist cures eye.
63. (d) Leprosy is caused by bacteria, Mycobacterium leprae and Mycobacterium lepromatosis. Measles is caused by virus. Kala-ajar is caused by protozoa of genus Leishmania. Athlete's foot is caused by fungi Epidermophyton floccosum, Trichophyton sp. অ্যাচিভার্স
64. (b) Myxedema is case of either hypothyroidism or hyperthyroidism due to defect in endocrine thyroid gland. Nephrosis is disease of nephrons of kidney, which is a part of excretory system. Paralysis is most often caused by damage in the nervous system or spinal cord. Syphilis is a sexually-transmitted disease of the reproductive system.

65. (b) Marasmus is caused by protein deficiency in under five years children. Kwashiorkor is deficiency of proteins, energy malnutrition caused by prolonged starvation. Tuberculosis is caused by Mycobacterium infection. Hepatitis B is a viral diseases. অ্যাডভান্স
66. (c) Night blindness is caused by deficiency of vitamin-A. Deficiency of vitamin D causes rickets. Deficiency of vitamin C causes scurvy. Deficiency of vitamin B causes beri-beri.
67. (a) The causative agent of Anthrax is used as a potent bioweapon in warfare. Thalassaemia is a disease caused by defective genes of haemoglobin. Surrogecy is an intermediate stage in artificial insemination for producing an offspring. The science of altering genes is a branch of biology known as transgenics.
68. (a) Malaria is a mosquito-borne infectious disease of humans caused by parasitic protozoans of genus Plasmodium. Poliomyelitis is caused by poliovirus. Tuberculosis is caused by Mycobacterium tuberculosis. Ringworm is caused by fungi. অ্যাডভান্স
69. (b) Hemophilia is a group of hereditary genetic disorders that impairs the body's ability to control blood clotting or coagulation. It is an X-chromosome-linked disorder and more likely to occur in males. Diabetes is a hormonal disorder in which sugar metabolism is affected. Deficiency of vitamin-D causes rickets in which bones of legs bend.  
Ringworm is fungal lesion like skin infection caused by Trichophyton rubrum, Trichophyton tonsurans, T. interdigitale, Microsporum canis, T. mentagrophytes.
70. (b) 'Filariasis' or Philariasis is a parasitic disease transmitted from black flies and mosquitoes to humans. Wuchereria bancrofti, Brugia malayi, Brugia timori cause 'lymphatic Filariasis'. In malaria, red blood cells are infected. 'Encephalitis' is an acute inflammation of the brain. Some of the most common causes of acute viral encephalitis are rabies virus, herpes simplex, poliovirus, measles virus and J.C. virus. 'Leukemia' or Leukaemia is a type of cancer of bone marrow. অ্যাডভান্স
71. (a) Ginger is an underground stem modification known as rhizome, which is a horizontal underground stem. Corm is an underground modified stem, in a form of short swollen food-storing stem surrounded by protective scale leaves, e.g. colocasia. Tuber, a modified, stem has many nodes and internodes, e.g. potato. Onion is a modified stem in the form of a bulb. অ্যাডভান্স
72. (c) Wine is a fermented drink made from the grapes or sugarcane or other fruits. Beer is an alcoholic beverage produced by the saccharification of starch and fermentation of the resulting sugar. The starch and saccharification enzymes are often derived from malted cereal grains of barley and wheat. Whisky is made from fermented grain mash of barley, malted barley, rye, malted rye, wheat, buckwheat and corn. Rum is made from molasses.
73. (b) Rhizophora constitutes the red mangroves which have respiring roots known as pneumatophores. Fasciculated roots are tuberous roots. Dahlias have fasciculated roots. Climbing roots are developed in Piper betle. Orchids have a characteristic feature of developing epiphytic roots. Epiphytic plants are those plants which develop aerial roots.
74. (a) Mangrove-plants have higher concentration of salts and minerals (solutes, such as proline and sorbitol) in the cells making their osmotic potential higher than the surrounding water in which they grow. This is a type of adaptation that allows water uptake by the plants in spite of growing in salty waters. Some mangroves also pump out excess salt by specialised roots.
75. (a) Indian Space Research Organisation (ISRO) is headquartered in Bengaluru. The Inter-University Centre for Astronomy and Astrophysics (IUCAA) is located in Pune, India. Inter-University Accelaerator Centre (IUAC) is an autonomous research facility of University Grants Commission which is based in New Delhi. Vikram Sarabhai Space Centre (VSSC) is a major space research centre of the Indian Space Research Organisation, focusing on rocket and space vehicles, is located in Thiruvananthapuram, Kerala.
76. (b) Arihant is a class of nuclear-powered ballistic missile submarine. AWACS, abbreviation of Airborne Warning and Control System, is a mobile, long-range surveillance and control centre for air defence, developed by the U.S. Air Force, is mounted on Boeing 707 aircraft.
77. (a)
78. (b) অ্যাডভান্স

79. (a) Devdas – Sharat Chandra Chattopadhyaya  
 Jhansi Ki Rani – Vrindavanlal Verma  
 Tyagpatra – Jainendra Kumar শ্রীচিভর্ষ  
 Chitralkha – Bhagwati Charan Verma
80. (a) The correctly matched pairs are :  
 Vinay Patrika – Tulsidas. Tulsidas, also known as Goswami Tulsidas; 1497 (1532–1623) was a poetsaint, reformer and philosopher renowned for his devotion to the god Rama.  
 Virangana – Maithili Sharan Gupta. Maithilisharan Gupt was one of the most important modern Hindi poets. He is considered one among the pioneers of Khari Boli poetry and wrote in Khari Boli dialect, at a time when most Hindi poets favoured the use of Braj Bhasha dialect.  
 Vish Vriksha – Bankim Chandra Chatterji. Rishi Bankim Chandra Chattopadhyay (27 June 1838 – 8 April 1894) was a Bengali writer, poet and journalist. He was the composer of India's national song Vande Mataram, originally a Bengali and Sanskrit stotra personifying India as a mother goddess and inspiring the activists during the Indian Freedom Movement.  
 Voice of Conscience — V.V. Giri. Varahagiri Venkata Giri, commonly known as V. V. Giri, was the fourth President of India from 24 August 1969 to 23 August 1974. He served as Acting President of India from 3 May 1969 to 20 July 1969, before getting elected.
81. (a) শ্রীচিভর্ষ
82. (d) The correctly matched pairs are :  
 Moon and Six pence – Somerset Maugham. William Somerset Maugham CH was a British playwright, novelist and short story writer. He was among the most popular writers of his era and reputedly the highest paid author during the 1930s.  
 The Moor's Last Sigh – Salman Rushdie. Sir Ahmed Salman Rushdie is a British Indian novelist and essayist. His second novel, Midnight's Children, won the Booker Prize in 1981. Much of his fictions are set in the Indian subcontinent.  
 Portait of India – Ved Mehta. Ved Parkash Mehta is a writer who was born in Lahore, British India.  
 He lost his sight at the age of four to cerebrospinal meningitis. শ্রীচিভর্ষ  
 Rage of Angels – Sidney Sheldon. Sidney Sheldon (February 11, 1917 – January 30, 2007) was an American writer. His TV works spanned a 20-year period during which he created The Patty Duke Show (1963–66), I Dream of Jeannie (1965–70) and Hart to Hart (1979–84), but he became most famous after he turned 50 and began writing best-selling novels, such as Master of the Game (1982), The Other Side of Midnight (1973) and Rage of Angels (1980). He is the seventh best selling fiction writer of all time.  
 All these are names of famous books written by the respective authors.
83. (c) Death Valley – California  
 Edward's Plateau – Texas শ্রীচিভর্ষ  
 Sonaran Desert – Arizona  
 The Everglades – Florida
84. (d) A black body is a theoretical object that absorbs 100% of the radiation that hits it. Therefore it reflects no radiation and appears perfectly black. At a particular temperature the black body would emit the maximum amount of energy possible for that temperature. This value is known as the black body radiation. It would emit at every wavelength of light as it must be able to absorb every wavelength to be sure of absorbing all incoming radiation. শ্রীচিভর্ষ
85. (c) Aspirin (USAN), also known as acetylsalicylic acid., is a salicylate drug, often used as an analgesic to relieve minor aches and pains, as an antipyretic to reduce fever, and as an anti-inflammatory medication. Aspirin was first isolated by Felix Hoffmann, a chemist with the German company Bayer in 1897. Salicylic acid, the main metabolite of aspirin, is an integral part of human and animal metabolism. While in humans much of it is attributable to diet, a substantial part is synthesized endogenously. শ্রীচিভর্ষ
86. (b) Food-grade phosphoric acid (additive E338) is used to acidify foods and beverages such as various colas, but not without controversy regarding its health effects. It provides a tangy or sour taste and, being a mass-produced chemical, is available cheaply and in large quantities. The low cost and bulk availability is unlike more expensive seasonings that give comparable flavors, such as citric acid which is obtainable from citrus, but usually fermented by Aspergillusniger mold from scrap molasses, waste starch hydrolysates and phosphoric acid.
87. (a) Wolffia is a genus of 9 to 11 species which

- include the smallest flowering plants on Earth. Commonly called watermeal or duckweed, these aquatic plants resemble specks of cornmeal floating on the water. Wolffia species are free-floating thalli, green or yellowgreen, and without roots. The flower is produced in a depression on the top surface of the plant body. It has one stamen and one pistil. Individuals often float together in pairs or form floating mats with related plants, such as Lemna and Spirodela species. Most species have a very wide distribution across several continents.
88. (d) A common first sign of tetanus is muscular stiffness in the jaw (lockjaw), followed by stiffness of the neck, difficulty in swallowing, rigidity of abdominal muscles, and spasms.
89. (d) Aquaculture: farming of aquatic organisms such as fish, crustaceans, molluscs and aquatic plants; Floriculture: cultivation of flowering and ornamental plants for gardens and for floristry; Sericulture: rearing of silkworms for the production of raw silk; and Viticulture: production and study of grapes. অ্যাডভান্স
90. (b) Bile is a bitter-tasting, dark green to yellowish brown fluid, produced by the liver that aids the process of digestion of lipids in the small intestine.
91. (b) The 34th session of the International Coordinating Council (ICC) of the Man and the Biosphere (MAB) Programme of the UNESCO held at UNESCO headquarters in Paris, France from 13th to 17th June 2022 approved to add 11 new biosphere reserves in 9 countries to the United Nations Educational, Scientific And Cultural Organization (UNESCO) World Network of Biosphere Reserves.
- i. The Khuvsgul Lake, located in Khuvsgul Province of Mongolia near the Russian borders, is the largest freshwater lake in Mongolia.
- ii. Including the 11 new sites, there are 738 biosphere reserves in 134 countries, including 22 transboundary sites.
92. (d) South Korea launched its first indigenously built space rocket – Korea Satellite Launch Vehicle (KSLV) II, called as “Nuri”, from Naro Space Center, Korea Aerospace Research Institute (KARI) in Goheung, South Jeolla Province, at a launch site in Goheung, Jeollanam-do Province, South Korea. In Korean, the word Nuri means ‘world’.
- i. With this launch, South Korea has become the World’s 10th nation to place a satellite into space with its own technology. অ্যাডভান্স
- ii. Nuri is a 3-stage rocket developed to put a 1.5-ton satellite into the low orbit of 600-800 kilometres above the Earth. Nuri, the 47.2-meter-long, 200-ton space rocket has a maximum diameter of 3.5 meters.
93. (d) The Indian Air Force (IAF) successfully test fired the first ever Extended Range Version of BrahMos Supersonic Cruise Missile (Air launched version) from Sukhoi Su-30 MKI fighter jet on the designated target in Bay of Bengal region.
- i. The range of the Extended range version of BrahMos missile is around 350 kilometres (km) from its original 290 km.
- ii. The BrahMos missile achieved a supersonic speed of 2.8 Mach or almost three times the speed of sound.
94. (c) The Former Finance Secretary Rajiv Kumar assumed charge as 25th Chief Election Commissioner (CEC), replacing the Incumbent Sushil Chandra who retired on May 14, 2022.
- i. Rajiv Kumar’s major task will be to hold and oversee the President and the Vice-President elections, which are due to be conducted in July-August 2022. অ্যাডভান্স
95. (a) RBI and the National Payment Corporation of India (NPCI) launched two landmark initiatives UPI123Pay and DigiSaathi.
- i. DigiSaathi is a 24/7 information Helpline for providing information on digital payment products which are available in English & Hindi that has been set up by NPCI.
- ii. UPI123PAY for feature phones to improve digital payments to a higher level, paving the way for a cashless economy.
- iii. Need for UPI123Pay: Earlier UPI can be accessed through NUUP (National Unified USSD Platform) using the short code of \*99#. But this option is cumbersome and not popular. Considering that there are more than 40 crore feature phone mobile subscribers in the country, UPI123pay will materially improve the options for such users to access UPI.
96. (d) India’s first portable solar rooftop system, was inaugurated at the Swaminarayan Akshardham temple complex, Gandhinagar, Gujarat, under the Ministry of New and Renewable Energy’s initiative to develop renewable energy cities across India.



- i. The 10 PhotoVoltaic (PV) Port System installation has been supported by the German agency Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). শ্রীচিভর্ষ
- ii. The Portable solar rooftop system, designed by GIZ, is a standard plug and play PV system with a minimum 2 KiloWatt peak (kWp) that comes with or without battery storage.
- iii. The PV ports have been manufactured by the New-Delhi based Servotech Power Systems Limited (SPSL), a leading high-end Solar Products manufacturer under the Make in India Project. শ্রীচিভর্ষ
97. (d) The World Bank (WB) has released a report titled 'Migration and Development Brief 36, May 2022: A War in a Pandemic: Implications of the Ukraine crisis and COVID-19 on Global Governance of Migration and Remittance Flows'. In accordance to this, India retained its position as the top recipient of remittances globally in 2021 worth \$89.4 billion as compared to \$82.73 billion in 2020.
- i. It is followed by Mexico at 2nd place and China at 3rd, Philippines (4th), and Egypt (5th).
- ii. The region of South Asia saw 7% gain in remittances to \$157 billion in 2021.
98. (d) India's largest reclining statue of Lord Buddha is being constructed in Bodh Gaya, Bihar. The 100 feet long and 30 feet high statue depicts Lord Buddha in a sleeping posture.
- i. The statue is being built by Buddha International Welfare Mission. The sculptors from Kolkata are building the statue with fiberglass. শ্রীচিভর্ষ
- ii. The construction of the statue was started in 2019 and it will be open for devotees from February 2023. শ্রীচিভর্ষ
99. (a) China successfully launched the 3 astronauts (including 1 woman astronaut) on a 6-month mission to complete the construction of China's Tiangong Space Station, a space station being built by the China Manned Space Agency (CMSA) in the Low Earth Orbit (LEO).
- i. The 3 Chinese astronauts, onboard the Shenzhou-14 spacecraft were lifted off from the Jiuquan Satellite Launch Center in northwest China. About the Tiangong Space Station:
- The construction of China's three-module space station began in April 2021 with the launch of the core module Tianhe – the 1st and biggest of the station's three modules.
  - The space station will operate in low-Earth orbit at an altitude between 340 to 450 kilometres. Following its completion, the station will have a lifespan of 10 years.
100. (d) Oil India Limited (OIL), India's second-largest hydrocarbon explorer and producer, has inaugurated "India's first 99.999 % pure" Green Hydrogen Pilot Plant in Jorhat, Assam, marking the country's first significant step toward a green hydrogen economy. শ্রীচিভর্ষ
- i. The first plant of its sort in India, has an installed capacity of 10 kg hydrogen per day and was commissioned in a record time of 3months at Jorhat pump station in Assam.
- ii. The plant is also the first in India to utilise the Anion Exchange Membrane (AEM) technology.

