

# NDA/NA

National Defence Academy/Naval Academy

## SOLVED PAPER 2021 (II)

### PAPER II : English Language and General Studies

#### Part A (English Language)

**Directions** (Q. Nos. 1-10) *Each item in this section consists of a sentence with an underlined word followed by four words (a), (b), (c) and (d). Select the option that is nearest in meaning to the underlined word.*

1. He is essentially a lowbrow person.  
(a) coarse (b) proud  
(c) passionate (d) pathetic  
⊗ (a) 'Lowbrow' means not highly cultured and lacking in refinement. Hence, 'coarse' is its correct synonym.
2. His nostalgia is deep.  
(a) excitement (b) longing  
(c) happiness (d) ability  
⊗ (b) 'Nostalgia' means a sentimental longing for a period in the past. Hence, option (b) is the correct answer.
3. His truancy is detrimental.  
(a) loyalty (b) integrity  
(c) honesty (d) absenteeism  
⊗ (d) 'Truancy' refers to the problem or situation of children being absent from school regularly without permission. Hence, 'absenteeism' is its correct synonym.
4. He is a maleficent person.  
(a) generous (b) cunning  
(c) criminal (d) friendly  
⊗ (c) 'Maleficent' means working or productive of harm or evil. Hence, 'criminal' is nearest in meaning to maleficent.
5. His solemnity is celebrated.  
(a) greed (b) desire  
(c) trust (d) dignity  
⊗ (d) 'Solemnity' refers to the state of being serious and dignified. Hence 'dignity' is its correct synonym.
6. His bounty is limitless.  
(a) benevolence (b) gallantry  
(c) nepotism (d) chivalry  
⊗ (a) 'Bounty' means generosity. Hence, 'benevolence' is its correct synonym.
7. The Holocaust was experienced by millions.  
(a) celebration (b) destruction  
(c) construction (d) beautiful  
⊗ (b) 'Holocaust' refers to destruction that occurred on a massive scale. Hence, option (b) is the correct answer.

8. His aversion is known to all.  
(a) hospitality (b) hostility  
(c) humility (d) humbleness  
⊗ (b) 'Aversion' refers to a strong dislike or disinclination towards something. Hence, 'hostility' is its correct synonym.
9. To be able to decipher something is wonderful.  
(a) decode (b) encode  
(c) simulate (d) animate  
⊗ (a) 'Decipher' means to convert a coded text or signal into normal language. Hence, 'decode' is its correct synonym.
10. It is the opportune time to think about investment in the real estate sector.  
(a) honorary (b) appropriate  
(c) difficult (d) unsuitable  
⊗ (b) 'Opportune' time means a time that is suitable for doing something. Hence 'appropriate' is its correct synonym.

**Directions** (Q. Nos. 11-20) *Each question in this section has a sentence with three parts labelled (a), (b) and (c). Read each sentence to find out whether there is any error in any part. If you find no error, your responses should be indicated as (d).*

11. Nursery classes (a) / for the children (b) / starts on April every year. (c) / No error (d)  
⊗ (c) Part (c) contains the error. Replace 'on' with 'in' to make the sentence error free.
12. The pollution level is very (a) / high in our city, and (b) / becomes a health hazard. (c) / No error (d)  
⊗ (c) Part (c) contains the error. Replace 'becomes' with 'has become' to make the sentence error free.
13. Indian is a country of linguistic (a) / and cultural diversity with (b) / multiple ethnic and social groups. (c) / No error (d)  
⊗ (d) The given sentence is error free.
14. Why does the lapse rate (a) / effect the tendency (b) / of air to rise ? (c) / No error (d)  
⊗ (b) Part (b) contains the error. Replace 'effect' with 'affect' to make the sentence grammatically correct.

15. The thorax is the upper part (a) / of your body from the neck down (b) / to the bottom of the ribs and diaphragm. (c) / No error (d)  
⊗ (b) Part (b) contains the error. Replace 'from' with 'extending from' to make the sentence error free.
16. The practical uses of astrology (a) / have seldom been seriously (b) / studied outside India. (c) / No error (d)  
⊗ (d) The given sentence is error free and grammatically correct.
17. She collected (a) / some armful of medicines and (b) / poured them down a drain. (c) / No error (d)  
⊗ (c) Part (c) contains the error. Replace 'a' with 'the' to make the sentence error free.
18. In many countries, the United Nations (a) / or other internationally organised (b) / peacekeeping forces are trying to keep the peace. (c) / No error (d)  
⊗ (b) Part (b) contains the error. Replace 'or' with 'and' to make the sentence error free.
19. Early cities rely on food and water (a) / from the surrounding countryside, (b) / but today cities often depend on distant sources. (c) / No error (d)  
⊗ (a) Part (a) contains the error. Replace 'early cities rely' with 'earlier cities relied' to make the sentence grammatically correct.
20. Climate change, whether it is (a) / natural or human-induced, (b) / is stressful for the people. (c) / No error (d)  
⊗ (c) Part (c) contains the error. Replace 'for' with 'to' to make the sentence error free.

**Directions** (Q. Nos. 21-30) *Each question in this section consists of a sentence with an underlined word followed by four words (a), (b), (c) and (d). Select the option that is opposite in meaning to the underlined word.*

21. His opinion is lopsided.

- (a) partial (b) crooked  
(c) unequal (d) balanced

⊗ (d) 'Lopsided' means not equally balanced. Hence, 'balanced' is its correct antonym.

22. His work is praiseworthy.

- (a) admirable (b) condemnable  
(c) commendable (d) creditable

⊗ (b) 'Praiseworthy' means deserving approval and admiration. Hence, 'condemnable' meaning blamable is opposite in meaning to praiseworthy.

23. His deeds had retrograde results .

- (a) progressive (b) negative  
(c) retreating (d) reverse

⊗ (a) 'Retrograde' means to revert to an earlier and inferior conditions. Hence, 'progressive' meaning forward-moving is its correct antonym.

24. He always offers palatable solutions.

- (a) acceptable (b) agreeable  
(c) unacceptable (d) pleasant

⊗ (c) 'Palatable' means acceptable or satisfactory. Hence, 'unacceptable' is its correct antonym.

25. His views on the subject are microscopic.

- (a) broad-based (b) minute  
(c) precise (d) fine

⊗ (a) 'Microscopic' means concerned with minute details. Hence, 'broad-based' is opposite in meaning to 'microscopic'.

26. He is always obdurate in his behaviour towards other people.

- (a) flexible (b) callous  
(c) insensible (d) obnoxious

⊗ (a) 'Obdurate' means stubbornly refusing to change one's opinion. Hence, 'flexible' is its correct antonym.

27. Mohan always had profound respect for Sohan.

- (a) deep (b) extreme  
(c) sincere (d) superficial

⊗ (d) 'Profound' means very great or intense. Hence, 'superficial' is its correct antonym. 'Superficial' means Seeming to have a particular quality, although this is not true or real.

28. We were living in turbulent times.

- (a) destructive (b) unstable  
(c) calm (d) stormy

⊗ (c) 'Turbulent' means involving a lot of sudden changes, arguments or violence. Hence, 'calm' is its correct antonym.

29. Amit is a dogmatic person.

- (a) assertive (b) amenable  
(c) bold (d) rigid

⊗ (b) 'Dogmatic' means of a person completely certain of their bailiffs and expecting other people to accept them. Hence, 'amenable' is its correct antonym as it means willing to accept what someone says or does without arguing.

30. Sachin is very fickle in his behaviour.

- (a) stable (b) capricious  
(c) mercurial (d) vacillating

⊗ (a) 'Fickle' means frequently changing one's loyalties and affections. Hence, 'stable' is its correct antonym.

**Directions (Q. Nos. 31-40)** Each of the following items in this section consists of a sentence, the parts of which have been jumbled. These parts have been labelled P, Q, R and S. Given below each sentence are four sequences namely (a), (b), (c) and (d). You are required to re-arrange the jumbled parts of the sentence and mark your answer carefully.

31. symbolic of peace, and prosperity (P)/the Gupta Empire in India is (Q)/represented through numismatic archaeological (R) / and literary evidences of multiple kinds (S)

The correct sequence should be

- (a) QPRS (b) QSRP  
(c) PSQR (d) RSQP

⊗ (a) QPRS

32. the transportation system so that it (P) / and not just the affluent section of society (Q) / provides mobility to everyone (R) / there are many ways to restructure (S)

The correct sequence should be :

- (a) PQRS (b) RQPS  
(c) SPRQ (d) QRPS

⊗ (c) SPRQ

33. and accurately displays spatial (P) / relationships between landforms and water bodies (Q) / the globe shows Earth's spherical shape (R) / and comparative distance between locations (S)

The correct sequence should be :

- (a) PQRS (b) RPQS  
(c) SPQR (d) QRPS

⊗ (b) RPQS

34. the function of the capillaries (P) / and other material to all the cells in (Q) / is to take nutrients, oxygen (R) / the body and to take away their waste material (S)

The correct sequence should be :

- (a) PRQS (b) RPQS  
(c) SPQR (d) QRPS

⊗ (a) PRQS

35. like mine (P) / even to someone with (Q) / a tin ear (R) / her singing sounded pretty melodious (S)

The correct sequence should be

- (a) PRQS (b) RPQS  
(c) SPQR (d) QRPS

⊗ (d) QRPS

36. The sorry state of affairs in the modern factories (P) / the Government of India (Q) / under the British was pro-capitalist (R) / though it took some half-hearted steps to mitigate (S)

The correct sequence should be :

- (a) PRQS (b) QRSP  
(c) SPQR (d) QPSR

⊗ (b) QRSP

37. of extreme poverty among its people (P) / economic policies was the prevalence (Q)/a major characteristic of British rule in India (R) / and the net result of British (S)

The correct sequence should be :

- (a) PRQS (b) QRSP  
(c) RSQP (d) QPSR

⊗ (c) RSQP

38. you can't judge (P) / very intelligent, but (Q) / a book by its cover (R) / he doesn't look (S)

The correct sequence should be :

- (a) SQPR (b) QRSP  
(c) RSQP (d) QPSR

⊗ (a) SQPR

39. membership and partisanship as well as (P) / can be found in the decline in party (Q) / evidence of a crisis in party politics (R) / in the rise of antiparty groups and movements (S)

The correct sequence should be :

- (a) RQPS (b) QRSP  
(c) RSQP (d) QPSR

⊗ (a) RQPS

40. government, market and voluntary organisations (P) / mixture of contributions from (Q) / the provision of public goods (R) / and services can be regarded as a complex (S)

The correct sequence should be

- (a) RQPS (b) QRSP  
(c) RSQP (d) QPSR

⊗ (c) RSQP

**Directions** (Q. Nos. 41-50) *Given below are some idioms / phrases followed by four alternative meanings for each. Choose the most appropriate answer from among the options (a), (b), (c) or (d).*

- 41. Once-over**  
 (a) To do something quickly  
 (b) To do something elaborately  
 (c) To do something perforce  
 (d) To do something for others
- ⊗ (a) The phrase 'once-over' means to review, inspect or examine something in a quick fashion.  
 Hence, option (a) is the correct answer.
- 42. A bag of bones**  
 (a) An extremely fat person  
 (b) An extremely thin person  
 (c) A wealthy person  
 (d) A healthy person
- ⊗ (b) The idiom 'a bag of bones' means a very thin person or animal.  
 Hence, option (b) is the correct answer.
- 43. Muddy the waters**  
 (a) To spread dirt around  
 (b) To make a situation easy  
 (c) To make one's life happy  
 (d) To make the situation complicated
- ⊗ (d) The idiom 'muddy the waters' means to make a situation more complicated or confusing than it was before.

- 51. Girth of stem of a plant increases due to division of cells in**  
 (a) apical meristem only  
 (b) lateral meristem only  
 (c) apical and intercalary meristem  
 (d) both apical and lateral meristem
- ⊗ (b) The girth of the stem of a plant increases due to the division of cells in lateral meristem only. Lateral meristems are known as secondary meristems because they are responsible for secondary growth or increase in stem girth and thickness.
- 52. Different varieties of the same gene are called**  
 (a) Genotypes (b) Sib pairs  
 (c) Alleles (d) Isomers
- ⊗ (c) Different varieties of the same gene are called alleles because an allele is a variant form of a gene. Some genes have a variety of different forms, which are located at the same position, or genetic locus, on a chromosome.

- 44. To level with**  
 (a) To be honest  
 (b) To be on a plain  
 (c) To cheat someone  
 (d) To take revenge
- ⊗ (a) The phrase 'to level with' someone means to tell someone the truth, especially when it may be unpleasant. Hence, 'To be honest' gives its correct meaning.
- 45. Show your hand**  
 (a) To tell people about the past  
 (b) To tell people about the future  
 (c) To tell people about them  
 (d) To tell people about your plans
- ⊗ (d) The idiom 'show your hands' means to allow people to know about your intentions.  
 Hence, option (d) is the correct answer.
- 46. To pull up**  
 (a) To lift heavy weights  
 (b) To check oneself  
 (c) To shorten the distance  
 (d) Too short of destination
- ⊗ (b) The phrase 'pull up' means to life cense someone to stop ore pause: check. So, 'To check' oneself given its correct meaning.
- 47. Be out of action**  
 (a) To get punishment  
 (b) To get reward

- (c) To become dysfunctional  
 (d) To become superlative
- ⊗ (c) The idiom 'be out of action' means broken or not working. Hence, option (c) given its correct meaning.
- 48. Learning from the school of hard knocks**  
 (a) Learning things from experience  
 (b) Learning things from others  
 (c) Learning things from environment  
 (d) Learning things through difficult experiences
- ⊗ (d) The idiom 'leaning form the school of hard knacks' means leaning thing through difficult experiences.
- 49. Raise some hackles**  
 (a) To annoy  
 (b) To make someone happy  
 (c) To do a great task  
 (d) To sit idle
- ⊗ (a) The idiom 'raise some hackles' means to annoy or upset someone.  
 Hence, option (a) is the correct answer.
- 50. A man of letters**  
 (a) An excellent artist  
 (b) A scholar in literature  
 (c) An outstanding sportsman  
 (d) A known novelist
- ⊗ (b) 'A man of letters' means a man, usually a writer, who knows a lot about literature. Hence, 'A Scholar in literature gives its correct meaning.

## Part B (General Studies)

- Alleles contribute to the organism's phenotype, which is the outward appearance of the organism. Some alleles are dominant or recessive.
- 53. Which one of the following viruses used to be responsible for highly infectious disease smallpox?**  
 (a) Adenovirus (b) Variola virus  
 (c) Aichi virus (d) Coxsackie virus
- ⊗ (b) Variola virus was used to be responsible for the highly infectious disease smallpox.  
 The disease is spread through person-to-person contact, most often from inhalation of air droplets expelled through the infected person. The disease was eradicated worldwide in 1976 through vaccination.
- 54. Buoyancy is a/an**  
 (a) upward pressure  
 (b) downward pressure  
 (c) downward force  
 (d) upward force
- ⊗ (d) Buoyancy or upthrust, is an upward force exerted by a fluid that opposes the weight of a partially or fully immersed object. In a column of fluid, pressure increases with depth as a result of the weight of the overlying fluid.
- 55. Weight and mass of an object are defined with Newton's laws of motion. Which among the following is true?**  
 (a) Weight is a constant of proportionality  
 (b) Mass is a constant of proportionality  
 (c) Mass is not a constant of proportionality  
 (d) Weight is a universal constant.
- ⊗ (b) The weight of an object is defined as the force of gravity on the object and may be calculated as the mass times the acceleration of gravity,  $w = mg$ . Since the weight is a force, its SI unit is the newton. Thus mass is a constant of proportionality.

**56. Fundamental laws of physics require**

- (a) conservation of energy and non-conservation of charge
- (b) conservation of charge and non-conservation of linear momentum
- (c) conservation of charge and non-conservation of energy
- (d) conservation of energy, momentum and charge

- ⊙ (d) Fundamental laws of physics require conservation of energy, momentum and Charge. With respect to classical physics, conservation laws include conservation of energy, mass (or matter), linear momentum, angular momentum, and electric charge. Most conservation laws are exact, or absolute, in the sense that they apply to all possible processes.

**57. Work is said to be one Joule when a force of**

- (a) 4 N moves an object by 25 cm
- (b) 2 N moves an object by 1 m
- (c) 1 N moves an object by 1 cm
- (d) 1 N moves an object by 50 cm

- ⊙ (a) One joule is defined as the amount of work done when a force of one newton is exerted through a distance of one meter. Thus force of 4 N moves an object by 25 cm resulting in 1 joule of work.

**58. A uniform motion of a car along a circular path experiences**

- (a) a change in speed due to a change in its direction of motion
- (b) a change in velocity due to a change in its direction of motion
- (c) a change in momentum due to no change in its direction of motion
- (d) a constant momentum due to a change in its direction of motion

- ⊙ (b) A uniform motion of a car along with a circular path experiences a change in velocity due to a change in its direction of motion.

Since velocity is a vector, changes in direction constitute changes in velocity. A change in velocity is known as acceleration. The change in velocity due to circular motion is known as centripetal acceleration.

**59. Three equal resistors are connected in parallel configuration in a closed electrical circuit. Then the total resistance in the circuit becomes**

- (a) one-third of the individual resistance
- (b) two-third of the individual resistance
- (c) equal to the individual resistance
- (d) three times of the individual resistance

- ⊙ (a) One-third of the individual resistance because if three or more resistors each with the same value are connected in parallel, then the equivalent resistance will be equal to  $\frac{R}{n}$  where  $R$  is the value of the resistor and  $n$  is the number of individual resistances in the combination.

**60. Rutherford's alpha-particle ( $\alpha$ ) scattering experiment was responsible for the discovery of which one of the following?**

- (a) Electron
- (b) Proton
- (c) Atomic Nucleus
- (d) Neutron

- ⊙ (c) Rutherford's alpha-particle experiment was responsible for the discovery of Atomic Nucleus. Ernest Rutherford's most famous experiment is the gold foil experiment. A beam of alpha particles was aimed at a piece of gold foil. Most alpha particles passed through the foil, but a few were scattered backward. This showed that most of the atom is empty space surrounding a tiny nucleus.

**61. What is the maximum number of electrons in the M-Shell?**

- (a) 6
- (b) 8
- (c) 18
- (d) 32

- ⊙ (c) Maximum number of electrons in the M-Shell is 18. Each shell has a fixed number of electrons. The formula to determine the number of electrons in a shell is  $2(n)^2$ .

For the M shell principle, the quantum number is 3.

So, the maximum number of electrons is  $= 2(3)^2$

Maximum number of electrons = 18.

**62. Chlorine occurs in nature in two isotopic forms of masses 35 u and 37 u in the ratio of 3 : 1 respectively. What is the average atomic mass of the Chlorine atom?**

- (a) 36.1 u
- (b) 35.5 u
- (c) 36.5 u
- (d) 35.1 u

- ⊙ (c) The average atomic mass for an element is calculated by summing the masses of the element's isotopes, each multiplied by its natural abundance on Earth.

$$\begin{aligned} \text{Average atomic mass} &= \frac{P_1x_1 + P_2x_2}{P_1 + P_2} \\ &= \frac{(35 \times 1) + (37 \times 3)}{3 + 1} = 36.5 \text{ u} \end{aligned}$$

**63. Which one of the following elements' isotopes is used in the treatment of cancer?**

- (a) Iodine
- (b) Sodium
- (c) Cobalt
- (d) Uranium

- ⊙ (c) Cobalt therapy is the medical use of gamma rays from the radioisotope cobalt-60 to treat conditions such as cancer. Beginning in the 1950s, cobalt-60 was widely used in external beam radiotherapy (teletherapy) machines, which produced a beam of gamma rays that was directed into the patient's body to kill tumor tissue.

**64. To protect steel and iron from rusting, a thin layer of which one of the following metals is applied?**

- (a) Magnesium
- (b) Zinc
- (c) Aluminium
- (d) Lead

- ⊙ (b) Zinc metal present on the surface of iron and steel forms a thin protective layer of basic zinc carbonate due to the reaction between zinc, oxygen,  $\text{CO}_2$  and moisture in the air. The standard reduction potential of Zinc is less than iron, or Zinc is more reactive than Iron. Hence, Iron will not undergo corrosion.

**65. Cinnabar is an ore of which one of the following?**

- (a) Copper
- (b) Zinc
- (c) Mercury
- (d) Manganese

- ⊙ (c) Cinnabar is a toxic ore of mercury, composed of mercury sulfide ( $\text{HgS}$ ). It is the only important ore of mercury. It has a bright red color that has caused people to use it as a pigment, and carve it into jewelry and ornaments for thousands of years in many parts of the world.

**66. Imagine a current-carrying straight conductor with magnetic field of lines in anti-clockwise direction. Then the direction of current is determined by**

- (a) the Right-Hand Thumb rule and it would be in the downward direction.
- (b) the Left-Hand Thumb rule and it would be in the downward direction.
- (c) the Right-Hand Thumb rule and it would be in the upward direction.
- (d) the Left-Hand Thumb rule and it would be in the upward direction.

- ⊙ (c) The right-hand thumb rule is used to find the direction of the magnetic field around a current carrying a straight conductor. Thus, a current-carrying straight conductor with the magnetic field of lines in the anti-clockwise direction would be in the upward direction according to the right-hand thumb rule.

**67. The device used to produce electric current is known as**

- (a) motor
- (b) generator
- (c) ammeter
- (d) galvanometer

- ⊗ (b) The device used to produce electric current is called a Generator. Electric generator, also called a dynamo, is any machine that converts mechanical energy to electricity for transmission and distribution over power lines to domestic, commercial, and industrial customers. Generators also produce the electrical power required for automobiles, aircraft, ships, and trains.
- 68.** Myopia is a defect in human vision where an image of a
- (a) nearby object is focused beyond the retina.  
 (b) nearby object is focused before the retina.  
 (c) distant object is focused before the retina.  
 (d) distant object is focused beyond the retina.
- ⊗ (c) Nearsightedness (myopia) is a common vision condition in which you can see objects near to you clearly, but objects farther away are blurry. It occurs when the shape of your eye causes light rays to bend (refract) incorrectly, focusing images in front of your retina instead of on your retina.
- 69.** Tyndall effect is a phenomenon of
- (a) scattering of light by the colloidal particles  
 (b) refraction of light by the colloidal particles  
 (c) dispersion of light by dust particles  
 (d) refraction of light by dust particles
- ⊗ (a) Tyndall effect, also called Tyndall phenomenon, scattering of a beam of light by a medium containing small suspended particles. For e.g., smoke or dust in a room, which makes visible a light beam entering a window. The effect is named for the 19th-century British physicist John Tyndall, who first studied it extensively.
- 70.** Twinkling of stars is primarily due to the atmospheric
- (a) refraction (b) reflection  
 (c) polarisation (d) dispersion
- ⊗ (a) The twinkling of a star is due to the atmospheric refraction of starlight. The starlight, on entering the earth's atmosphere, undergoes refraction continuously before it reaches the earth. The atmospheric refraction occurs in a medium of gradually changing refractive index.
- 71.** Dingko Singh, an Asian Games gold medallist, who died recently, was associated with which one of the following games?
- (a) Swimming (b) Boxing  
 (c) Archery (d) Gymnastics
- ⊗ (b) Dingko Singh was an Indian boxer who won the gold medal at 1998 Asian Games in Bangkok. He was from the North-eastern Indian state of Manipur. He was awarded the Padma Shri by the Government of India in 2013.
- 72.** Who among the following is the lone Indian Cricketer included in the ICC Hall of Fame special inductions to mark the inaugural ICC World Test Championship Final?
- (a) Dilip Vengsarkar  
 (b) Ravi Shastri  
 (c) Mohinder Amarnath  
 (d) Vinoo Mankad
- ⊗ (d) Vinoo Mankad is the lone Indian Cricketer included in the ICC Hall of Fame special inductions to mark the inaugural ICC World Test Championship Final. The BCCI commemorated Vinoo Mankad's contribution to Indian cricket, naming the domestic Under-19 One day tournament as the Vinoo Mankad Trophy.
- 73.** Which one of the following nations is not a permanent member of G7?
- (a) India (b) Canada  
 (c) France (d) Italy
- ⊗ (a) India is not the permanent member of G7. The Group of Seven is an inter-governmental political forum consisting of Canada, France, Germany, Italy, Japan, the United Kingdom and the United States.
- 74.** Operation Olivia, an initiative to protect Olive Ridley turtles, is undertaken by
- (a) Indian Navy  
 (b) Indian Coast Guard  
 (c) Ministry of Environment Forest and Climate Change  
 (d) Ministry of Earth Sciences
- ⊗ (b) Operation Olivia, an initiative to protect Olive Ridley turtles, is undertaken by Indian Coast Guard. Operation Olivia was started by the Indian Coast Guard (ICG), first in early 1980s. This operation helps in protecting Olive Ridley turtles every year when they start nesting along Odisha coast for breeding in months of November to December.
- 75.** Who among the following is the winner of French Open 2021 Men's Singles Final?
- (a) Novak Djokovic  
 (b) Rafael Nadal  
 (c) Stefanos Tsitsipas  
 (d) Daniil Medvedev
- ⊗ (a) Novak Djokovic is the winner of the French Open 2021 Men's Singles Final. Novak Djokovic defeated Stefanos Tsitsipas in the final, 6–7, 2–6, 6–3, 6–2, 6–4 to win the Men's Singles tennis title at the 2021 French Open. He is from Serbia and is currently (as of November, 2021) the No.1 Ranked tennis player in the world.
- 76.** Economist Rebeca Grynspan, who recently became the first woman to be appointed as the head of the United Nations Conference on Trade and Development (UNCTAD), hails from
- (a) Germany (b) Poland  
 (c) Costa Rica (d) Mexico
- ⊗ (c) Economist Rebeca Grynspan, who recently became the first woman to be appointed as the head of the United Nations Conference on Trade and Development (UNCTAD), hails from Costa Rica. UNCTAD is a permanent intergovernmental body established by the United Nations General Assembly in 1964. Its headquarters are located in Geneva, Switzerland. It also have offices in New York and Addis Ababa.
- 77.** 'Belt and Road Initiative' is a foreign policy initiative of
- (a) China (b) USA  
 (c) Canada (d) Japan
- ⊗ (a) Belt and Road Initiative' is a foreign policy initiative of China. It is also known as One Belt One Road or OBOR and is a global infrastructure development strategy adopted by the Chinese government in 2013 to invest in nearly 70 countries and international organizations.
- 78.** Which one of the following is the theme of the International Day of Yoga 2021?
- (a) Yoga at home and yoga with family  
 (b) Yoga for climate action  
 (c) Yoga for well-being  
 (d) Yoga for peace.
- ⊗ (c) Yoga for well-being is the theme of the International Day of Yoga 2021. The International Day of Yoga has been celebrated annually on 21st June since 2015, following its inception in the United Nations General Assembly in 2014. Yoga is a physical, mental and spiritual practice which originated in India.
- 79.** Kenneth Kaunda, who died recently at the age of 97, was the former President of
- (a) Brazil (b) Mexico  
 (c) Zambia (d) South Sudan
- ⊗ (c) Kenneth Kaunda, who died recently at the age of 97, was the former President of Zambia. He was the first

- President of Zambia from 1964 to 1991. He was at the forefront of the struggle for independence from British rule. Zambia, in southern Africa, is a landlocked country of rugged terrain and diverse wildlife, with many parks and safari areas.
- 80.** The maiden Indian Navy - European Union Naval Force (IN-EUNAVFOR) Exercise (2021) was conducted in
- (a) Gulf of Mannar  
(b) Gulf of Aden  
(c) Gulf of Khambhat  
(d) Gulf of Aqaba
- ⊗ (b) Indian Navy - European Union Naval Force (IN-EUNAVFOR) Exercise (2021) was conducted in Gulf of Aden. Along with Indian Navy, other naval forces are from Italy, Spain and France. The naval exercise included advanced air defence and anti-submarine exercises, tactical manoeuvres, Search & Rescue, and other maritime security operations.
- 81.** The pH value of Milk of Magnesia is approximately
- (a) Zero (b) 7  
(c) 10 (d) 14
- ⊗ (c) pH value of Milk of Magnesia is approximately 10. It is a base and is used to neutralize the excess acid in the stomach.
- 82.** Which one of the following compounds is used in 'black and white' photography?
- (a) AgF (b) AgBr  
(c) AgCl (d) Ag<sub>2</sub>SO<sub>4</sub>
- ⊗ (b) AgBr (Silver Bromide) is used in black and white photography. Its use in black and white photography is an example of Photochemical reaction. Silver chloride is sensitive to light and breaks down to bromide form metallic silver, which appears black.
- 83.** What is the number of water molecules present in a Ferrous Sulphate crystal?
- (a) 1 (b) 3  
(c) 5 (d) 7
- ⊗ (d) 7 water molecules are present in a Ferrous Sulphate crystal known as the water of crystallization. The colour in ferrous sulphate is due to the presence of water molecule in it.
- 84.** What is the colour of the precipitate obtained by passing CO<sub>2</sub> gas through lime water?
- (a) Green (b) Blue  
(c) White (d) Brown
- ⊗ (c) White colour precipitate is obtained by passing CO<sub>2</sub> (carbon dioxide) gas through lime water. Carbon dioxide reacts with limewater (a solution of calcium hydroxide, Ca(OH)<sub>2</sub>, to form a white precipitate (appears milky) of calcium carbonate, CaCO<sub>3</sub>. Adding more carbon dioxide results in the precipitate dissolving to form a colourless solution of calcium hydrogencarbonate.
- 85.** Which one of the following pairs of elements is liquid at room temperature and at normal pressure?
- (a) Gallium and Bromine  
(b) Mercury and Bromine  
(c) Gallium and Mercury  
(d) Gallium and Caesium
- ⊗ (b) The two liquid elements at room temperature and at normal pressure are Mercury (symbol Hg and atomic number 80) and Bromine (symbol Br and atomic number 35). Mercury is the only metal that is a liquid at room temperature.
- 86.** Which one of the following methods can be used to separate anthracene from a mixture of salt and anthracene?
- (a) Distillation (b) Sublimation  
(c) Evaporation (d) Chromatography
- ⊗ (b) Sublimation is the conversion between the solid and the gaseous phases of matter, with no intermediate liquid stage. Thus, Sublimation can be used to separate anthracene from a mixture of salt and anthracene.
- 87.** Shoots of plant show upward movement and it can be designated to be
- (a) Negatively phototropic  
(b) Positively chemotropic  
(c) Positively hydrotropic  
(d) Negatively geotropic
- ⊗ (d) The tendency of plant stems and other parts to grow upwards. This is called negative geotropism because the plant is growing away from the force of gravity. A negative geotropism is a turning away from the earth, such as by a plant stem that grows upward.
- 88.** Which one of the following statements about the process of photosynthesis is correct ?
- (a) Chemical energy is converted into light energy.  
(b) Carbon dioxide is oxidised to form carbohydrate.  
(c) Water molecule splits into hydrogen and oxygen.  
(d) Light energy is directly used to split water.
- ⊗ (d) Photosynthesis is a process used by plants and other organisms to convert light energy into chemical energy that, through cellular respiration, can later be released to fuel the organism's activities. Here, light energy is directly used to split water.
- 89.** How are evergreen plants with woody stems having naked seed classified?
- (a) Angiosperms  
(b) Monocotyledons  
(c) Pteridophytes  
(d) Gymnosperms
- ⊗ (d) Gymnosperms are woody plants, either shrubs, trees, or, rarely, vines (some gnetophytes). They differ from flowering plants in that the seeds are not enclosed in an ovary but are exposed (naked seeds) within any of a variety of structures, the most familiar being cones.
- 90.** Which one of the following tissues is known as basic packing tissue and found" in xylem and phloem?
- (a) Collenchyma (b) Parenchyma  
(c) Sclerenchyma (d) Vessels
- ⊗ (b) Parenchyma forms the bulk of plant ground tissue, where they may be specialised to function in photosynthesis, storage, or transport. Parenchyma is integral to vascular tissue, where it provides a route of exchange for materials within and between the xylem and the phloem.
- 91.** Which one from among the following planets is largest in size?
- (a) Earth (b) Venus  
(c) Mars (d) Mercury
- ⊗ (a) Size of the planets in order from smallest to largest is Mercury, Mars, Venus, Earth, Neptune, Uranus, Saturn, and Jupiter. Thus, Earth is the bigger in size as compared to Mercury, Mars and Venus.
- 92.** Match List I with List-II and select the correct answer using the codes given below the lists :
- | List I<br>(Place) | List II<br>(Feature)                |
|-------------------|-------------------------------------|
| A. Mumbai         | 1. Queen of the Arabian Sea         |
| B. Visakhapatnam  | 2. Biggest port of India            |
| C. Chennai        | 3. Land-locked harbour              |
| D. Kochi          | 4. Oldest port on the Eastern Coast |

### Codes

	A	B	C	D		A	B	C	D
(a)	2	4	3	1	(b)	2	3	4	1
(c)	1	3	4	2	(d)	1	4	3	2

- ⊗ (b) The correct matching is A-2,B-3,C-4,D-1.

Mumbai Port is India's largest port by size and shipping traffic. Located in West Mumbai on the western coast of India, the Mumbai Port is situated in a natural harbor.

Visakhapatnam port is the land locked port in India and the only major port of Andhra Pradesh. It is India's third largest state-owned port by volume of cargo handled and largest on the Eastern Coast.

Chennai is the oldest port on the eastern coast of India. It is formerly known as Madras Port, is the second largest container port of India, behind Mumbai's Nhava Sheva. The port is the largest one in the Bay of Bengal.

Kochi port is known as the 'Queen of Arabian Sea' as it was an important trade center for spices on the western coast of India from the 14th century.

- 93.** Which one of the following is a crater lake in India?

(a) Lonar lake  
(b) Sambhar lake  
(c) Chilika lake  
(d) Vembanad lake

- ⊗ (a) Lonar Lake, also known as Lonar crater, is a notified National Geo-heritage Monument situated in the state of Maharashtra and is a crater lake. It was created due to a meteorite. It is the only major hoverback in the basalt.

- 94.** Fine-grained bed of ephemeral lake in a desert is also known as

(a) Playa (b) Oasis  
(c) Drumlin (d) Natural levee

- ⊗ (a) Playa is a fine-grained bed of ephemeral lake in a desert. A playa is a dry, vegetation-free, flat area at the lowest part of an undrained desert basin. It is a location where ephemeral lakes form during wet periods, and is underlain by stratified clay, silt, and sand, and commonly, soluble salts.

- 95.** Which one of the following factors does not affect the distribution of groundwater?

(a) Amount of precipitation  
(b) Rate of evaporation  
(c) Ability of the ground surface to allow water to infiltrate into the groundwater system  
(d) Distance from the sea

- ⊗ (d) The factors affecting the occurrence and distribution of ground water includes eight criteria; land use, soil, slope, rainfall, elevation, lithology, lineament density and drainage density.

Thus amount of precipitation (rainfall), Rate of evaporation and the infiltration of the water to the ground (drainage density) are relevant factors. Distance from sea has no bearing on distribution of ground water.

- 96.** The Constitution (35th Amendment) Act of 1974 is related to which one of the following States?

(a) Mizoram  
(b) Sikkim  
(c) Nagaland  
(d) Arunachal Pradesh

- ⊗ (b) 35th amendment to the constitution is related to the state of sikkim. It gives effect to the wishes of the people of Sikkim for strengthening Indo-Sikkim co-operation and inter-relationship, the Bill seeks to amend the Constitution to provide for the terms and conditions of association to Sikkim with the Union.

- 97.** Which one of the following best describes the electoral system of India?

(a) First-Past-the-Post System  
(b) Proportional Representation  
(c) Mixed System  
(d) General Ticket

- ⊗ (a) First past the post system is the electoral system of India. In a first-past-the-post electoral system, voters cast their vote for a candidate of their choice, and the candidate who receives the most votes wins (even if the top candidate gets less than 50%, which can happen when there are more than two popular candidates).

- 98.** Which one of the following is a non-justiciable right?

(a) Right to adequate livelihood  
(b) Right against exploitation  
(c) Right of accused  
(d) Right to life and personal liberty

- ⊗ (a) Right to adequate means of livelihood under Article 39 is a non-justiciable right mentioned in part IV as Directive principal of state policy. Right against exploitation (Article 23), Right of accused (Article 20) and Right to life and personal liberty (Article 21) are all fundamental rights enshrined in part III of the Constitution and are justiciable in nature under Article 32 of the Indian Constitution.

- 99.** Which one of the following is not a writ?

(a) Mandamus (b) Habeas Corpus  
(c) Certiorari (d) Severability

- ⊗ (d) Severability is not a writ. There are 5 writs mentioned under Article 32 viz, Habeas Corpus; Mandamus; Prohibition; Certiorari; Quo-Warranto. Under these Writs, Judiciary can protect the rights of the aggrieved parties.

- 100.** Which one of the following is not a part of Fundamental Rights?

(a) Right to education  
(b) Right to establish educational institutions by minorities  
(c) Right to be conferred with titles  
(d) Right against untouchability

- ⊗ (c) Right to be conferred with titles is not a fundamental rights as Article 18(1) abolishes all titles. It prohibits the State to confer titles on anybody whether a citizen or a non-citizen.

Military and academic distinctions are, however, exempted from the prohibition.

- 101.** Which one of the following is not a function of the Constitution of India?

(a) To ensure participation of good people in politics.  
(b) To guarantee a set of rights to citizens.  
(c) To define the power of the different organs of government.  
(d) To create conditions for a just society.

- ⊗ (a) To ensure participation of good people in politics is not a function of the constitution of India as it provides everyone an opportunity as a freedom to participate in democratic politics.

Rights of the citizens are mentioned in Part III, Separation of powers of executive, judiciary and legislature is also defined in the constitution and Directive principles of state policy mentions provisions for a just society.

- 102.** Which one of the following statements about biodiversity is not correct?

(a) The term 'biodiversity' was coined by Walter G. Rosen in 1986.  
(b) The term 'biodiversity hotspots' was coined by Norman Myers in 1988.  
(c) The regions having richest biodiversity are called 'biodiversity hotspots'.  
(d) More than 100 hotspots of biodiversity are identified in the world.

- ⊗ (d) Statement (d) is incorrect. There are 36 biodiversity hotspots in the world. These regions have very high level of species richness or high level of biodiversity concentration. The term biodiversity was given by Walter G. Rosen in 1986, while 'Biodiversity Hotspot' term was coined by Norman Myers in 1988.
- 103.** The Earth's atmosphere is mainly heated by which one of the following?  
 (a) Short wave solar radiation  
 (b) Reflected solar radiation  
 (c) Long wave terrestrial radiation  
 (d) Scattered solar radiation
- ⊗ (c) Earth's atmosphere is mainly heated by Long wave terrestrial radiation. The insolation received by the earth is in the form of shortwaves. The earth after being heated itself becomes a radiating body and it radiates energy to the atmosphere in the long waveform.
- 104.** Which one of the following is the correct sequence of layers as we move from the Earth's surface upwards?  
 (a) Troposphere, Stratosphere, Thermosphere, Mesosphere  
 (b) Troposphere, Stratosphere, Mesosphere, Thermosphere  
 (c) Thermosphere, Mesosphere, Stratosphere, Troposphere  
 (d) Stratosphere, Mesosphere, Troposphere, Thermosphere
- ⊗ (b) Moving upward from ground level, the correct sequence of atmospheric layers are the troposphere (upto 12 km), stratosphere (located between 12-50 km), mesosphere (located between 50-80 km), thermosphere (80-700 km) and exosphere (located between 700-10000 km).
- 105.** Which one of the following is not a soil forming factor?  
 (a) Parent material  
 (b) Topography  
 (c) Climate  
 (d) Human habitation
- ⊗ (d) Human habitation is not a soil forming factor. The whole soil, from the surface to its lowest depths, develops naturally as a result of five factors. The five factors are: 1. parent material, 2. relief or topography, 3. organisms (including humans), 4. climate, and 5. time.
- 106.** Which one of the following best describes the Lithosphere?  
 (a) Upper and lower mantle  
 (b) Crust and core  
 (c) Crust and upper mantle  
 (d) Lower mantle and core
- ⊗ (c) The lithosphere includes the crust and, below, the uppermost layer of the mantle; it floats on the weaker asthenosphere. The lithosphere is the outer solid shell of the Earth. As the cooling surface layer of the Earth's convective system, the lithosphere thickens over time.
- 107.** Which one of the following countries has the maximum time difference from Greenwich Mean Time (GMT) ?  
 (a) India (b) Nepal  
 (c) Sri Lanka (d) Bhutan
- ⊗ (d) Bhutan (GMT+6) has the maximum time difference from the Greenwich Mean Time. India (GMT+5:30), Nepal (GMT +5:45) and Sri Lanka (GMT+5:30) are all behind Bhutan and closer to GMT.
- 108.** Which one of the following is not a feature of the Constitution of India?  
 (a) It provides a set of basic rules.  
 (b) It specifies the power of the Government.  
 (c) It is the supreme law of the land.  
 (d) It specifies the supremacy of the judiciary.
- ⊗ (d) Primacy of judiciary is not one of the provisions of the Indian constitution. It provides a set of rights in Part III of the constitution, it also provides a basic set of rules in the form separation of powers between different organs of the government and is the supreme law of the land and nothing in contravention of the constitution can be done in the country.
- 109.** Which one of the following statements about the Attorney General of India is not correct?  
 (a) He has the right of audience only in the Supreme Court of India.  
 (b) He shall receive such remuneration as the President may determine.  
 (c) He shall be qualified to be appointed as a Judge of the Supreme Court.  
 (d) He shall give advice to the Government of India on all legal matters.
- ⊗ (a) Statement (a) is not correct. The Attorney General for India is the Indian government's chief legal advisor, and is its principal Advocate before the Supreme Court of India. The Attorney General has the right of audience in all Courts in India as well as the right to participate in the proceedings of the Parliament, though not to vote.
- 110.** Who among the following described the Directive Principles of State Policy as the novel feature of the Constitution of India?  
 (a) Jawaharlal Nehru  
 (b) Rajendra Prasad  
 (c) S.N. Mukherjee  
 (d) B.R. Ambedkar
- ⊗ (d) Dr. B.R. Ambedkar described the Directive Principles of State Policy as the novel feature of the Constitution of India. Directive Principle of State Policy ("DPSP") are a set of social and economic obligations imposed on the Government (Union & State) to establish a welfare society.
- 111.** Cornea in human eye  
 (a) is a light sensitive screen.  
 (b) is a muscular diaphragm.  
 (c) contains blood vessels.  
 (d) is composed of proteins and cells.
- ⊗ (d) Cornea in human eye is composed of protein and cells. The cornea is made up of cellular and acellular components. The cellular components include the epithelial cells, keratocytes, and endothelial cells. The acellular component includes collagen and glycosaminoglycans. The epithelial cells are derived from epidermal ectoderm.
- 112.** Power of a lens of focal length 25 cm is  
 (a) + 2.5 Dioptre (b) + 3 Dioptre  
 (c) + 4 Dioptre (d) + 5 Dioptre
- ⊗ (c) Power of a lens of focal length 25 cm is +4 Dioptre.  
 First we will convert the focal length in meters.  
 $\Rightarrow 25 \text{ cm} = 0.25 \text{ m}$   
 Now, substituting the value of focal length in the formula of power of lens we get  

$$P = 10.25 \text{ m}^{-1}$$

$$\Rightarrow P = 4 \text{ m}^{-1}$$
 m<sup>-1</sup> is also expressed as diopters or D  
 As it is a convex lens so its power is positive. Thus, the power of the lens is +4D.
- 113.** What is the total number of chambers in the stomach of domestic animals like cattle, buffalo, goat and sheep ?  
 (a) Four (b) Two  
 (c) One (d) Three
- ⊗ (a) There are four chambers in stomach of domestic animals like cattle, buffalo, goat and sheep. Ruminant stomachs have four compartments: the rumen, the reticulum, the omasum and the abomasum.

- 114.** Intestinal bacteria are main source of which one of the following vitamins?  
 (a) Vitamin E (b) Vitamin C  
 (c) Vitamin B<sub>12</sub> (d) Vitamin A
- ⊗ (c) Intestinal bacteria are main source of Vitamin B<sub>12</sub>. Vitamin B<sub>12</sub> is readily absorbed in the last part of the small intestine (ileum), which leads to the large intestine. However, to be absorbed, the vitamin must combine with intrinsic factor, a protein produced in the stomach.
- 115.** Which one of the following hormones is responsible for the development of female sexual characters?  
 (a) Prolactin (b) Estrogen  
 (c) Oxytocin (d) Progesterone
- ⊗ (b) Estrogen is a hormone responsible for development of female sexual characters. It acts on organs in the body (including the breast and uterus) and as a chemical messenger in the brain, controlling key aspects of the reproductive system, including childbirth and lactation, and aspects of human behaviour.
- 116.** Spherical mirror formula relating an object distance 'u', image distance 'v' and focal length of mirror 'f' may be applied to a plane mirror when  
 (a) focal length goes to infinity.  
 (b) focal length goes to zero.  
 (c) image distance goes to zero.  
 (d) image distance goes to infinity.
- ⊗ (a) Spherical mirror formula relating an object distance u, image distance v and focal length of mirror f may be applied to a plane mirror when focal length goes to infinity. For plane Mirror focal length is infinite. Thus power = 1/focal length results in power being Zero.
- 117.** Nuclear energy is generated by  
 (a) nuclear fission and its expression was proposed by Einstein.  
 (b) nuclear fission and its expression was proposed by Rutherford.  
 (c) nuclear fusion and its expression was proposed by Bohr.  
 (d) nuclear fusion and its expression was proposed by Heisenberg.
- ⊗ (b) Nuclear energy is generated by nuclear fission and its expression was proposed by Rutherford. A nuclear reactor is driven by the splitting of atoms, a process called fission, where a particle (a 'neutron') is fired at an atom, which then fissions into two smaller atoms and some additional neutrons.

- 118.** Reverberation is a phenomenon associated with a  
 (a) multiple refraction of sound.  
 (b) multiple reflection of sound.  
 (c) single refraction of sound.  
 (d) single reflection of sound.
- ⊗ (b) Reverberation is a phenomenon associated with a multiple reflection of sound. Reverberation is the phenomenon of persistence of sound after it has been stopped as a result of multiple reflections from surfaces such as furniture, people, air, etc. These reflections build up with each reflection and decay gradually as they are absorbed by the surfaces of objects in the space enclosed.
- 119.** Which among the following is true for propagation of sound waves?  
 (a) Sound can travel in vacuum and it is a transverse wave in air.  
 (b) Sound cannot travel in vacuum and it is a longitudinal wave in air.  
 (c) Sound can travel in vacuum and it is a longitudinal wave in air.  
 (d) Sound cannot travel in vacuum and it is a transverse wave in air.
- ⊗ (b) Statement (b) is true. Sound cannot travel in vacuum and it is a longitudinal wave in air. Sound propagates through air or other mediums as a longitudinal wave, in which the mechanical vibration constituting the wave occurs along the direction of propagation of the wave.
- 120.** A tennis ball is thrown in the vertically upward direction and the ball attains a maximum height of 20 m. The ball was thrown approximately with an upward velocity of  
 (a) 8 m/s (b) 12 m/s  
 (c) 16 m/s (d) 20 m/s
- ⊗ (d) In this question  
 $H(\text{max}) = 20\text{m}$   
 and  $g = 10\text{ m/s}^2$ .  
 According to formula  
 $\text{Height}(\text{max}) = \frac{u^2}{g}$   
 Hence, the answer will be 20 m/s.
- 121.** An object of mass 2000 g possesses 100 J kinetic energy. The object must be moving with a speed of  
 (a) 10.0 m/s (b) 11.1 m/s  
 (c) 11.2 m/s (d) 12.1 m/s
- ⊗ (a) In this question,  
 Mass (M) = 2000 g  
 Kinetic energy (K) = 100 J

According to formula,

$$K = \frac{1}{2}mv^2$$

$$100 = \frac{1}{2} \times 2000 \times v^2$$

$$100 = 1000 \times v^2$$

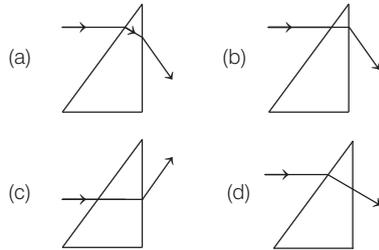
$$v^2 = 100$$

$$v = 10.0\text{ m/s}$$

Hence, the correct answer is 10.0 m/s

- 122.** Which one of the following ions is not iso-electronic with F<sup>-</sup>?  
 (a) O<sup>2-</sup> (b) Na<sup>+</sup>  
 (c) Ne (d) N<sup>-</sup>
- ⊗ (d) N negative is not iso-electronic with F<sup>-</sup> because Isoelectronic species are known as atoms or ions that have the same number of electrons. In isoelectronic species, there the number of electrons would be equal but the elements would be different. In other words, ions and atoms which are having equal numbers of electrons are called the isoelectronic species.
- 123.** What is the total number of covalent bonds in methanol?  
 (a) 3 (b) 4  
 (c) 5 (d) 6
- ⊗ (c) There are total number of 5 covalent bonds in methanol as carbon is attached to 3 H and 1 OH with 4 covalent bonds. O and H in OH are bonded with 1 covalent bond. So there are total 5 covalent bonds.
- 124.** Which one of the following is the chemical formula of Plaster of Paris?  
 (a) CaSO<sub>4</sub> ·  $\frac{1}{2}$ H<sub>2</sub>O  
 (b) CaSO<sub>4</sub> · 2H<sub>2</sub>O  
 (c) CaSO<sub>4</sub> · 5H<sub>2</sub>O  
 (d) CaSO<sub>4</sub> · 4H<sub>2</sub>O
- ⊗ (a) Plaster of paris is calcium sulphate hemihydrate. Its chemical formula is: CaSO<sub>4</sub> ·  $\frac{1}{2}$ H<sub>2</sub>O. It is prepared by heating gypsum to a temperature of 100°C in a kiln; it loses 3/4th of its water of crystallisation and forms plaster of paris.
- 125.** The unit of the ratio between thrust and impulse is same as that of  
 (a) frequency  
 (b) speed  
 (c) wavelength  
 (d) acceleration
- ⊗ (a) Thrust is force. Impulse is the integral of a force, F, over the time interval, t, for which it acts.  
 Thus the ratio of thrust i.e F and Impulse would give time inverse which is equivalent to Frequency.

**126.** Which one of the following figures correctly shows the path of a ray of light through a glass prism?



- ⊙ (a) Figure a correctly shows the path of a ray of light through a glass prism as it shows the rays moving towards normal while going from rarer to denser medium and away from normal while moving from denser to rarer medium.

**127.** When a light beam falls on a triangular glass prism, a band of colours is obtained. Which one of the following statements is correct in this regard?

- (a) Red light bends the most, as the refractive index of glass for red light is greatest.  
 (b) Red light bends the most, as the refractive index of glass for red light is lowest.  
 (c) Violet light bends the most, as the refractive index of glass for violet light is greatest.  
 (d) Violet light bends the most, as the refractive index of glass for violet light is lowest.
- ⊙ (c) Each beam of light, with its own particular wavelength (or color), is slowed differently by the glass. The light waves are refracted as they enter and leave the prism. The shorter the wavelength of the light, the more it is refracted. Violet light is refracted the most as it has the shortest wavelength causing the coloured light to spread out to form a spectrum.

**128.** The image of an object formed by a plane mirror is

- (a) erect, real and larger.  
 (b) erect, virtual and same size.  
 (c) inverted, virtual and same size.  
 (d) inverted, real and smaller.
- ⊙ (b) The image formed by a plane mirror is always virtual (meaning that the light rays do not actually come from the image), erect (upright), and of the same shape and size as the object it is reflecting.

A virtual image is a copy of an object formed at the location from which the light rays appear to come.

**129.** Which one of the following is not a conservative force?

- (a) Frictional force  
 (b) Electric force  
 (c) Gravitational force  
 (d) Spring force
- ⊙ (a) Frictional forces are not conservative forces because the amount of work done by friction depends on the path. One can associate a potential energy with a conservative force but not with a non-conservative force. A conservative force is one for which the work done is independent of path.

**130.** A negative work is done when an applied force  $F$  and the corresponding displacement  $S$  are

- (a) perpendicular to each other.  
 (b) parallel to each other.  
 (c) anti-parallel to each other.  
 (d) equal in magnitude.
- ⊙ (c) A negative work is done when an applied force and the corresponding displacement  $S$  are anti-parallel to each other. The work  $W$  that a force  $F$  does on an object is the product of the magnitude  $F$  of the force, times the magnitude  $d$  of the displacement, times the cosine of the angle  $\theta$  between them. In symbols,  $W = fd \cos \theta$ .  
 So, if angle is 180 degree,  $W$  will be negative.

**131.** Which of the following statements about the Indian Councils Act of 1861 is/are correct?

1. It enlarged the Governor General's Council for the purpose of making laws.
2. The Governor General was not authorised to increase the number of members.

Select the correct answer using the codes given below:

- (a) Only 1                      (b) Only 2  
 (c) Both 1 and 2            (d) Neither 1 nor 2
- ⊙ (a) Statement 1 is correct. Indian Councils Act of 1861 enlarged the Governor General's Council for the purpose of making laws. For the executive functions of the Council, a fifth member was added. Now there were five members for home, military, law, revenue, and finance. (A sixth member for public works was added in 1874.)

**132.** Which one of the following statements about Tattvabodhini Patrika is correct?

- (a) It promoted a systematic study of India's past in the Bengali language.

- (b) It promoted a systematic study of India's past through Sanskrit sources.  
 (c) It promoted a systematic study of India's past through Persian sources.  
 (d) It promoted a systematic study of India's past through Western sources.

- ⊙ (a) Statement a is correct. Tattvabodhini Patrika promoted a systematic study of India's past in the Bengali language. On 6 October 1839 Debendranath Tagore established Tattvaranjini Sabha which was shortly thereafter renamed the Tattvabodhini (Truth-seekers) Sabha. The objective of Tattvabodhini Sabha was to encourage religious inquiries and disseminate the essence of Upanishads.

**133.** In which one of the following years did the British demarcate a large area of land as Damin-i-koh for settling the Santhals?

- (a) 1810                      (b) 1793  
 (c) 1885                      (d) 1832

- ⊙ (d) It was in the year 1832 that the British demarcated a large area of land as Damin-i-Koh for settling the Santhals. Damin-i Koh is in the area of Sahebganj, Pakur, and Godda districts in the Jharkhand. British persuaded the local tribe of Rajmahal Hills i.e. Santhals to live in the foothills of Rajmahal by giving land to them. "Damin-i-Koh" is a Persian term that means 'skirts of the hills'.

**134.** The Tropic of Cancer does not pass through which one of the following States?

- (a) Manipur                      (b) West Bengal  
 (c) Gujarat                      (d) Jharkhand

- ⊙ (a) The tropic of cancer does not pass through the state of Manipur. The Tropic of Cancer passes through eight states in India: Gujarat (Jasdan), Rajasthan (Kalinjarh), Madhya Pradesh (Shajapur), Chhattisgarh (Sonhat), Jharkhand (Lohardaga), West Bengal (Krishnanagar), Tripura (Udaipur) and Mizoram (Champhai).

**135.** Which of the following pairs of crop and product is/are correctly matched?

1. Food crop                      Ragi
2. Cash crop                      Jute
3. Plantation crop              Coconut

Select the correct answer using the codes given below:

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

- ⊙ (c) All are correctly matched.

'Ragi' also known as Finger Millet, is a robust, popular food crop and marvelous grain crop in India. It is called dryland crops. Jute is also known as the golden fiber and is India's major cash crop. Jute fiber is obtained from the inner bark of the jute plant. It is used in making gunny bags, mats, ropes, yarn, carpets and other artifacts.

The term plantation crop refers to those crops which are cultivated on an extensive scale in contiguous areas, owned and managed by an individual or a company. The crops include tea, coffee, rubber, cocoa, **coconut**, arecanut, oil palm, palmyrah and cashew.

**136.** Which one of the following coalfields is not located in Jharkhand?

- (a) Jharia (b) Ramgarh  
(c) Deogarh (d) Umaria

⊗ (d) Umaria Coalfield is located in Umaria district in the Indian state of Madhya Pradesh in the valley of the Umrer River, a tributary of the Son River.

**137.** Which one of the following is the longest parallel of latitude?

- (a) Tropic of Cancer  
(b) Tropic of Capricorn  
(c) Arctic Circle  
(d) Equator

⊗ (d) Equator is the longest parallel of latitude. The Equator is at 0°, and the North Pole and the South Pole are at 90° north and 90° south, respectively. The Equator is the longest circle of latitude and is the only circle of latitude which also is a great circle.

**138.** The periodic rise and fall of ocean water in response to gravitational forces is called

- (a) Current (b) Waves  
(c) Tides (d) Tsunami

⊗ (c) The periodic rise and fall of ocean water in response to gravitational forces is called Tides. Tides are long-period waves that move through the oceans in response to the forces exerted by the moon and sun. Tides originate in the oceans and progress toward the coastlines where they appear as the regular rise and fall of the sea surface.

**139.** Which of the following statements about the first Indian Factory Act passed in 1881 is/are correct?

- The Act dealt primarily with the problem of child labour.
- The Act laid down that children between 7 years and 12 years of age would not work for more than 9 hours a day.

Select the correct answer using the code given below:

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

⊗ (c) Both 1 and 2 are correct. In 1875, a committee was appointed to inquire the conditions of all factories. After effect of this committee, factory act 1881 was adopted. The act prohibited the employment of children under the age of 7. Children between the ages of 7-12 were to work for a maximum of 9 hours. It was passed during viceroyship of Lord Rippon.

**140.** Which of the following statements about Mahatma Gandhi's anti-untouchability campaign is/are correct?

- The All India Harijan Sevak Sangh was founded for this purpose.
- The campaign was to root out untouchability, since it did not enjoy the sanction of the Hindu Shastras.

Select the correct answer using the codes given below:

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

⊗ (a) Statement 1 is correct. In 1932, Gandhi founded the Harijan Sevak Sangh as part of his efforts to eradicate the concept of untouchability from India's caste system.

Statement 2 is incorrect-Untouchability did not enjoy the sanction of shastras as it is based on the caste-based system mentioned as varna system in Rig Veda dividing society into four classes.

**141.** The founders of the Paramhansa Mandali founded in Maharashtra believed in which one of the following?

- Social distancing along caste lines
- Glorification of caste system
- Forbidding widow remarriage
- One God and in breaking caste rules

⊗ (d) The founders of the Paramhansa Mandali founded in Maharashtra believed in One God and in breaking caste rules.

Paramahansa Mandali was a secret socio-religious group, established in 1849, in Bombay and is closely related to Manav Dharma Sabha which was founded in 1844. It was started by Durgaram Mehtaji, Dadoba Pandurang, and a group of his friends.

**142.** Which one of the following statements about the ishtahars issued 'during the Revolt of 1857 is correct?

- They glorified the Muslim rule in India.
- They glorified the co-existence of different communities under the Mughal Empire.
- They glorified the message of Islam.
- They glorified the role of Queen Victoria.

⊗ (b) Statement b is correct. Ishtahars glorified the co-existence of different communities under the Mughal Empire. During the revolt only a few proclamations and 'ishtahars' (notification) were issued by rebel leaders to propagate their ideas and persuade people to join the revolt. Proclamation issued by rebel leaders appealed to all sections of the population irrespective of cast and creed. The rebellion was seen as a war in which both Hindus and Muslims were equally to lose or gain. It was remarkable that during the uprising, the religious division between Hindus and Muslims was hardly noticeable despite the attempt of the British government.

**143.** During the Industrial Revolution, who among the following designed the 'flying shuttle loom'?

- Samuel Crompton
- Edmund Cartwright
- John Kay
- Richard Arkwright

⊗ (c) John Kay was an English inventor whose most important creation was the flying shuttle, which was a key contribution to the Industrial Revolution. Through this machine one person could operate a shuttle across a very wide loom, which greatly increased the rate of cloth production.

**144.** Match List I with List II and select the correct answer using the codes given below the lists :

List I (Dam)	List II (State)
A. Hirakud	1. Gujarat
B. Panchet	2. Bihar
C. Kosi	3. Odisha
D. Ukai	4. Jharkhand

**Codes**

- A B C D            A B C D  
(a) 3 4 2 1        (b) 3 2 4 1  
(c) 1 2 4 3        (d) 1 4 2 3

⊗ (a) The correct matching is A-3, B-4, C-2, D-1.

Hirakud Dam Project is a multipurpose scheme intended for flood control, irrigation and power generation. The dam is built across river Mahanadi at about 15 km upstream of Sambalpur town in the state of Odisha.

Panchet dam is built across the Damodar River in Dhanbad District's Panchet area in Jharkhand.

Koshi High Dam, is a multipurpose project proposed to be constructed on the Saptakoshi River of Nepal. The project is primarily aimed to control floods in south-east Nepal and northern Bihar of India.

Ukai dam is the largest multipurpose project so far completed in Gujarat state. The Ukai dam is located across Tapi River near Ukai village of Fort-Songadh taluka in Surat district.

**145.** Which one of the following features is the result of erosion and deposition work of a river?

- (a) Pothole (b) Oxbow lake  
(c) Levee (d) Rapid

- ⊗ (a) Pothole is the result of erosion and deposition work of a river. Pothole is a cylindrical, bowl-shaped, or irregular hollow that is usually deeper than wide. It is formed in the rocky bed of a stream by either the grinding action of sediment whirled around by stream eddies or the force of fast flowing water. Potholes usually have spirally grooved surfaces.

**146.** Which one of the following is not a feature of agriculture in India?

- (a) Subsistence agriculture  
(b) Pressure of population on agriculture  
(c) Dependence upon Monsoon  
(d) Predominance of cash crops

- ⊗ (d) Predominance of cash crops is not a feature of agriculture in India.

Contrary to staple and food crops, cash crops form a small part of Indian agriculture and are entirely sold and exported. Indian agriculture is subsistence-based, dependent on Monsoon rains and 1.25 billion people are dependent on only 2.4 percent of arable land in the world.

**147.** Which one of the following is not a specified Sub-Mission of the National Livestock Mission?

- (a) Livestock development  
(b) Pig development in North-Western region  
(c) Fodder and feed development  
(d) Skill development, technology transfer and extension

- ⊗ (b) Pig development in the north-western region is not a specified Sub-Mission of the National Livestock Mission. National Livestock Mission scheme is implemented with the following three Sub-Missions: Sub-Mission on Breed Development of Livestock & Poultry, Sub-Mission on Feed and Fodder development, Sub-Mission on Extension and Innovation.

**148.** Who among the following wrote the famous text 'A Discourse on Political Economy'?

- (a) Montesquieu (b) Voltaire  
(c) Rousseau (d) Adam Smith

- ⊗ (c) Jean-Jacques Rousseau wrote the famous text 'A Discourse on Political Economy' in 1775. A revolutionary and controversial work, this book is a classic of political theory and a key source of democratic ideals.

**149.** Which of the following statements about the resolution adopted in the Karachi session of the Indian National Congress with regard to fundamental rights and economic policy is/are correct?

1. It was opposed by Ambalal Sarabhai.
2. Its 20 points included demands for civil liberties and adult suffrage.

Select the correct answer using the codes given below :

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

- ⊗ (b) Option 2 is correct. The Karachi Resolution was passed by the Indian National Congress at its 1931 Karachi session.

Elections on the basis of Universal Adult Franchise and Basic civil rights of freedom of speech, Freedom of Press, Freedom of assembly, Freedom of association were included in the 20 points put forward in the resolution.

**150.** Which of the following statements about the Law Commission headed by Lord Macaulay is/are correct ?

1. It attempted to codify the laws.
2. It was opposed to uniform system of Courts.

Select the correct answer using the codes given below:

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

- ⊗ (a) Option 1 is correct. Lord Macaulay headed the first such Law Commission established in 1834 under the Charter Act of 1833. It recommended codification of the Penal Code, the Criminal Procedure Code, and a few other matters.

The statement (2) is incorrect as it supported the idea of uniform system of courts.