

Time: 1hr 40min

Total Marks: 400

Important Instructions:

1. This Test contains 100 items (questions) Each item comprises four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case, you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **ONLY ONE** response for each item.
2. You have to mark all your responses **ONLY** on the separate Answer Sheet provided.
3. All items carry equal marks.
4. Before you proceed to mark in the Answer Sheet the response to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per instructions.
5. Penalty for wrong answers:

THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY A CANDIDATE IN THE OBJECTIVE TYPE QUESTION PAPERS.

- (i) There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, one-third of the marks assigned to that question will be deducted as penalty.
- (ii) If a candidate gives more than one answer, it will be treated as a wrong answer even if one of the given answers happens to be correct and there will be same penalty as above to that question.
- (iii) If a question is left blank, i.e., no answer is given by the candidate, there will be no penalty for that question.

1. Which one from among the following planets is largest in size?
(a) Earth (b) Venus
(c) Mars (d) Mercury
2. Match List I with List II and select the correct answer using the code given below the lists:
List I (Place) List II (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
Code:
A B C D
(a) 2 4 3 1
(b) 2 3 4 1
(c) 1 3 4 2
(d) 1 4 3 2
3. Which one of the following is a crater lake in India?
(a) Lonar Lake (b) Sambhar Lake
(c) Chilika Lake (d) Vembanad Lake
4. Fine-grained bed of ephemeral lake in a desert is also known as
(a) Playa (b) Oasis
(c) Drumlin (d) Natural levee
5. 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
6. 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
7. 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
8. 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

9. Which one of the following is **not** a writ?
 (a) Mandamus (b) Habeas Corpus
 (c) Certiorari (d) Severability
10. 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
11. 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.
12. 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.
13. 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
14. 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
15. Which one of the following is **not** a soil forming factor?
 (a) Parent material
 (b) Topography
 (c) Climate
 (d) Human habitation
16. 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
17. 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
18. 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.
19. 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.
20. 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
21. 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 code given below:
 (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

22. 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.
23. 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
24. The Tropic of Cancer does **not** pass through which one of the following States?
- (a) Manipur (b) West Bengal
 (c) Gujarat (d) Jharkhand
25. 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 code given below:
- (a) 1 only (b) 2 and 3 only
 (c) 1, 2 and 3 (d) 3 only
26. Which one of the following coalfields is **not** located in Jharkhand?
- (a) Jharia (b) Ramgarh
 (c) Deogarh (d) Umaria
27. Which one of the following is the longest parallel of latitude?
- (a) Tropic of Cancer
 (b) Tropic of Capricorn
 (c) Arctic Circle
 (d) Equator
28. The periodic rise and fall of ocean water in response to gravitational forces is called
- (a) Current (b) Waves
 (c) Tides (d) Tsunami
29. Which of the following statements about the first Indian Factory Act passed in 1881 is/are correct?
1. The Act dealt primarily with the problem of child labour.
2. 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) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2
30. Which of the following statements about Mahatma Gandhi's anti-untouchability campaign is/are correct?
1. The All India Harijan Sevak Sangh was founded for this purpose.
 2. The campaign was to root out untouchability, since it did not enjoy the sanction of the Hindu shastras.
- Select the correct answer using the code given below:
- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2
31. The founders of the *Paramhansa Mandali* founded in Maharashtra believed in which one of the following?
- (a) Social distancing along caste lines
 (b) Glorification of caste system
 (c) Forbidding widow remarriage
 (d) One God and in breaking caste rules
32. Which one of the following statements about the *ishtahars* issued during the Revolt of 1857 is correct?
- (a) They glorified the Muslim rule in India.
 (b) They glorified the co-existence of different communities under the Mughal Empire.
 (c) They glorified the message of Islam.
 (d) They glorified the role of Queen Victoria.
33. During the Industrial Revolution, who among the following designed the 'flying shuttle loom'?
- (a) Samuel Crompton
 (b) Edmund Cartwright
 (c) John Kay
 (d) Richard Arkwright
34. Match List I with List II and select the correct answer using the code given below the lists:
- | | |
|---------------------|------------------------|
| <i>List I (Dam)</i> | <i>List II (State)</i> |
| A. Hirakud | 1. Gujarat |
| B. Panchet | 2. Bihar |
| C. Kosi | 3. Odisha |
| D. Ukai | 4. Jharkhand |

Code:

A B C D

(a) 3 4 2 1

(b) 3 2 4 1

(c) 1 2 4 3

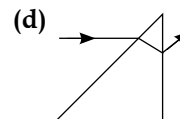
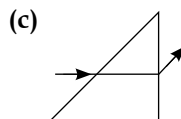
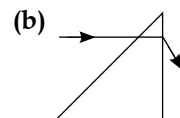
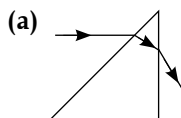
(d) 1 4 2 3

35. 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
36. 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
37. 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
38. Who among the following wrote the famous text *'A Discourse on Political Economy'*?
- (a) Montesquieu (b) Voltaire
(c) Rousseau (d) Adam Smith
39. 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 code given below:
- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2
40. 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 code given below:
- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2
41. 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
42. 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
43. Which one of the following nations is **not** a permanent member of G7?
- (a) India (b) Canada
(c) France (d) Italy
44. 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
45. Who among the following is the winner of the French Open 2021 Men's Singles Final?
- (a) Novak Djokovic (b) Rafael Nadal
(c) Stefanos Tsitsipas (d) Daniil Medvedev
46. 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
47. 'Belt and Road Initiative' is a foreign policy initiative of
- (a) China
(b) United States of America
(c) Canada
(d) Japan

48. 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
49. Kenneth Kaunda, who died recently at the age of 97, was the former president of
(a) Brazil
(b) Mexico
(c) Zambia
(d) South Sudan
50. 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
51. The pH value of Milk of Magnesia is approximately
(a) Zero (b) 7
(c) 10 (d) 14
52. Which one of the following compounds is used in 'black and white' photography?
(a) AgF (b) AgBr
(c) AgCl (d) Ag₂SO₄
53. What is the number of water molecules present in a Ferrous Sulphate crystal?
(a) 1 (b) 3
(c) 5 (d) 7
54. What is the colour of the precipitate obtained by passing CO₂ gas through lime water?
(a) Green (b) Blue
(c) White (d) Brown
55. 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
56. 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
57. 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
58. 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.
59. How are evergreen plants with woody stems having naked seed classified?
(a) Angiosperms (b) Monocotyledons
(c) Pteridophytes (d) Gymnosperms
60. 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
61. 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.
62. Different varieties of the same gene are called
(a) Genotypes (b) Sib pairs
(c) Alleles (d) Isomers
63. 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
64. Buoyancy is a/an
(a) upward pressure
(b) downward pressure
(c) downward force
(d) upward force
65. 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.
66. 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.
67. 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.
68. 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.
69. 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.
70. Rutherford's alpha-particle (α) scattering experiment was responsible for the discovery of which one of the following?
(a) Electron (b) Proton
(c) Atomic Nucleus (d) Neutron
71. What is the maximum number of electrons in the M-Shell?
(a) 6 (b) 8
(c) 18 (d) 32
72. 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
73. Which one of the following elements' isotopes is used in the treatment of cancer?
(a) Iodine (b) Sodium
(c) Cobalt (d) Uranium
74. 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
75. Cinnabar is an ore of which one of the following?
(a) Copper (b) Zinc
(c) Mercury (d) Manganese
76. 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.
77. The device used to produce electric current is known as
(a) motor (b) generator
(c) ammeter (d) galvanometer
78. 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.
79. 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.
80. Twinkling of stars is primarily due to the atmospheric
(a) refraction (b) reflection
(c) polarization (d) despersion
81. 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.
82. Power of a lens of focal length 25 cm is
 (a) +2.5 Dioptre (b) +3 Dioptre
 (c) +4 Dioptre (d) +5 Dioptre
83. 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
84. Intestinal bacteria are main source of which one of the following vitamins?
 (a) Vitamin E (b) Vitamin C
 (c) Vitamin B₁₂ (d) Vitamin A
85. Which one of the following hormones is responsible for the development of female sexual characters?
 (a) Prolactin (b) Estrogen
 (c) Oxytocin (d) Progesterone
86. 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.
87. 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.
88. 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.
89. 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.
90. 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
91. 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
92. Which one of the following ions is **not** iso-electronic with F⁻?
 (a) O²⁻ (b) Na⁺
 (c) Ne (d) N⁻
93. What is the total number of covalent bonds in methanol?
 (a) 3 (b) 4
 (c) 5 (d) 6
94. Which one of the following is the chemical formula of Plaster of Paris?
 (a) $\text{CaSO}_4 \cdot \frac{1}{2}\text{H}_2\text{O}$
 (b) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
 (c) $\text{CaSO}_4 \cdot 5\text{H}_2\text{O}$
 (d) $\text{CaSO}_4 \cdot 4\text{H}_2\text{O}$
95. The unit of the ratio between thrust and impulse is same as that of
 (a) frequency (b) speed
 (c) wavelength (d) acceleration
96. Which one of the following figures correctly shows the path of a ray of light through a glass prism?



97. 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.
98. 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.
99. Which one of the following is **not** a conservative force?
- (a) Frictional force
 - (b) Electric force
 - (c) Gravitational force
 - (d) Spring force
100. 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.

Answers

Q No	Answer Key	Topic Name	Chapter Name
1	(a)	Planets	Solar System
2	(b)	Ports	Static GK
3	(a)	Lakes	Important Lakes of India
4	(a)	Landforms	Landforms and their Evolution
5	(a)	Ground Water	Water
6	(b)	Amendments	Amendments in Indian Constitution
7	(a)	Election	Election and Representation
8	(a)	Fundamental Rights	Justiciable Rights
9	(d)	Writs	Writs Issued by Supreme Court
10	(c)	Fundamental Rights	Fundamental Rights
11	(a)	Functions of Constitution	Constitution
12	(d)	Biodiversity	Biodiversity and Conservation
13	(c)	Radiation	Solar Radiation, Heat Balance and Temperature
14	(b)	Air	Layers of Atmosphere
15	(d)	Types of Soils	Soils
16	(c)	Major Domains of Earth	Lithosphere
17	(d)	GMT	Time Zones
18	(d)	Features of Indian Constitution	Constitution
19	(a)	Attorney General of India	Attorney General of India
20	(d)	Directive Principles of State Policy	Directive Principles of State Policy
21	(a)	Indian Council Act	Acts
22	(a)	Journal	A General Survey of Socio-Cultural Reform Movement
23	(d)	Santhals	Colonialism and the Countryside
24	(a)	Tropic of Cancer	Tropic of Cancer
25	(c)	Types of Crops	Crops
26	(d)	Coalfields	Static GK
27	(d)	Circles of latitude	Latitudes and longitudes
28	(c)	Tide	Water
29	(c)	Labour Legislations	Survey of British Policies in India
30	(c)	Socio-Religious Reform Movement	Reforms
31	(d)	Survey of Socio-Cultural Reform Movements	Reforms
32	(b)	Revolt of 1857	The Revolt of 1857 And Its Representations
33	(c)	Industrial Revolution	Towards Modernisation
34	(a)	Dams	Static Gk
35	(b)	Features of River	Our Changing Earth

Q No	Answer Key	Topic Name	Chapter Name
36	(d)	Agriculture	Agriculture
37	(b)	Government Scheme	Current Affairs
38	(c)	Books and Author	Current Affairs
39	(b)	Karachi Session	Sessions of Congress
40	(a)	Law Commission	Development of Judiciary in British India
41	(b)	Sports	Current Affairs
42	(d)	Sports	Current Affairs
43	(a)	G7	Current Affairs
44	(b)	Project Olivia	Current Affairs
45	(a)	French Open	Current Affairs
46	(c)	Famous Personalities	Current Affairs
47	(a)	Project	Current Affairs
48	(c)	Important day	Current Affairs
49	(c)	Famous Personalities	Current Affairs
50	(b)	Navel Exercise	Current Affairs
51	(c)	pH Scale	Acids, Bases and Salts
52	(b)	Applications of Redox Reactions	Redox Reactions
53	(d)	Water of Crystallization	Coordination Compounds
54	(c)	Reaction of CO ₂	Compounds of Carbon
55	(b)	Classifications of Elements	Periodic Table
56	(b)	Separation of Mixtures	Analytical Techniques
57	(d)	Plant Movements	Plant growth & Development
58	(d)	Photosynthesis	Photosynthesis
59	(d)	Gymnosperms	Plant kingdom
60	(b)	Permanent tissues	Plant Anatomy
61	(d)	Meristem	Plant Anatomy
62	(c)	Genotype	Genetics
63	(b)	Communicable Disease	Human Diseases
64	(d)	Buoyancy	Mechanical Properties of Fluids
65	(c)	Mass	Gravitation
66	(b)	Fundamental Laws	Physical World
67	(a)	Force	Laws of Motion
68	(b)	Circular Motion	Laws of Motion
69	(a)	Equivalent Resistance	Current Electricity
70	(c)	Rutherford's Atomic Model	Structure of Atom
71	(c)	Concept of Shell and Subshells	Structure of Atom
72	(b)	Atomic and Molecular Mass	Some Basic Concepts of Chemistry
73	(c)	Uses of Radioisotopes	Nuclear Reactions and Radioactivity
74	(b)	Rusting	Redox Reactions
75	(c)	Ores and Minerals	Metallurgy

Q No	Answer Key	Topic Name	Chapter Name
76	(c)	Direction of Magnetic Field	Magnetic Effect of Electric Current
77	(b)	Generator	Alternating Current
78	(c)	Eye	Neural Control
79	(a)	Tyndall Effect	Ray Optics
80	(a)	Atmospheric Refraction	Ray Optics
81	(d)	Eye	Neural Control
82	(c)	Power of Lens	Ray Optics
83	(a)	Stomach	Digestive System
84	(c)	Intestine	Digestive System
85	(b)	Female Sex Hormones	Human Reproduction
86	(a)	Plane Mirror	Ray Optics
87	(a)	Nuclear Fission	Nuclei
88	(b)	Sound	Waves
89	(b)	Sound	Waves
90	(d)	Motion in a Straight Line	Motion
91	(a)	Kinetic Energy	Work, Energy and Power
92	(d)	Isoelectric Species	Structure of Atom
93	(c)	Types of Bonds	Chemical Bonding
94	(a)	Plaster of Paris	Some Important Chemical Compounds
95	(a)	Units	Units and Measurements
96	(a)	Refraction through Glass Prism	Ray Optics
97	(c)	Refraction through Glass Prism	Ray Optics
98	(b)	Plane Mirror	Ray Optics
99	(a)	Friction	Laws of Motion
100	(c)	Work	Work, Energy and Power

Answers with Explanation

1. Option (a) is correct.

Explanation:

- Earth – 3,959mi (6,371km) radius.
- Venus – 3,760mi (6,052km) radius
- Mars – 2,106mi (3,390km) radius
- Mercury – 1,516mi (2,440km) radius

2. Option (b) is correct.

Mumbai Port – It is India's second oldest port (1873), Kolkata being the oldest (1870). It is also the largest port of India by size. It is spread over 400 square kilometres.

Visakhapatnam Port – It is the only major port of Andhra Pradesh. It is an all-weather and a landlocked port. It was established in 1933.

Chennai Port – It was formerly known as Madras Port. It is the third oldest port of India. It was established in year 1881. It is the oldest port on Eastern Coast.

Kochi – It is called as the "Queen of the Arabian Sea". It is a major port city located on the Malabar Coast bordering the Laccadive Sea, which is a part of the Arabian Sea.

3. Option (a) is correct.

Explanation:

Lonar Lake

- It located at Lonar in Buldhana district of Maharashtra.
- It is also known as Lonar crater.
- It is a notified National Geo-heritage Monument. A geographical area of national importance and heritage, as notified by the Geological Survey of India (GSI).
- It is also known as saline and soda lake.
- The crater is considered to be the result of a meteorite impact. It contains water which is both saline and alkaline.

4. Option (a) is correct.

Explanation:

Playas

- Playas are shallow basins in deserts that periodically fill with rainwater.

- The water in playas is retained only for short duration due to evaporation and quite often the playas contain good deposition of fine-grained sediment and salts. The playa plain which is covered up by salts is called alkali flats.
- Other names for playas – pan, flat and dry lake, ephemeral ponds or lakes

5. Option (a) is correct.

Explanation:

Following are the factors affecting the distribution of groundwater:-

1. Precipitation

The most important factor controlling infiltration is the amount and characteristics of precipitation that falls as rain or snow.

Precipitation infiltrates into the ground often seeps into streambeds over an extended period, thus a stream will often continues to flow when it has not rained for a long time and where there is no direct runoff from recent precipitation.

2. Infiltration

It is defined as the flow of water from ground into the subsurface. It is meters per unit time of water entering into the soil regardless of the types or values of forces or gradients.

3. Baseflow

The water in streams has a sustained flow, even during periods of lack of rain.

4. Soil characteristic

Soils, such as clays, absorb less water at a slower rate than sandy soils.

5. Soil saturation

Like a wet sponge, soil already saturated from previous rainfall cannot absorb much more so more rainfall will become surface runoff.

6. Land cover

land covers have a crucial impact on infiltration and rainfall runoff.

Vegetation can slow the movement of runoff. It allow more time for rain water to seep into the ground.

7. The slope of the land

Water falling on steeply-sloped land runs off more quickly and infiltrates less with respect to water falling on flat land.

8. Evapotranspiration

Plants need this shallow groundwater to grow, and, by the process of evapotranspiration, water is returned back into the atmosphere.

Thus, Distance from the sea is not a direct factor affecting the distribution of groundwater.

6. Option (b) is correct.

Explanation:

35th Constitutional Amendment Act of 1974

- After the lapse of British paramountcy in 1974, Sikkim became a 'protectorate' of India. As a result of this, the Indian Government assumed responsibility for the external affairs, defence and communications of Sikkim.
- Sikkim expressed its desire for greater association with India in 1975. Thus, the 35th Constitutional Amendment Act (1974) was enacted by parliament.
- 35th Amendment laid down a set of conditions that made Sikkim an "Associate State", a special designation not used by any other state. A month later, the 36th Amendment repealed the 35th Amendment, and made Sikkim a full state, adding its name to the First Schedule of the Constitution.
- However, Sikkim became the full-fledged state (22nd state) of India only after the enactment of the 36th Constitutional Amendment Act (1975).

7. Option (a) is correct.

Explanation:

The First Past the Post (FPTP) system

- It is the system in which the candidate who is ahead of others, who crosses the winning post first of all, is considered as the winner. This method is also called the Plurality System and the territorial representation system.
- The constitution of India has adopted the system of territorial representation (First-past-the-post system) for the election of members to the Lok Sabha.
- However, in the case of Rajya Sabha, the Constitution has adopted the system of proportional representation.

Under the FPTP System

- Every member of the legislature represents a geographical/territorial area known as a constituency. The whole country is divided into 543 constituencies.
- Each constituency elects one representative and the candidate who secures the maximum number of votes in that constituency is declared elected.

8. Option (a) is correct.

Explanation:

- The Fundamental Rights are justiciable in nature. They are enforceable by the courts for their violation.
- On the other hand, the Directive Principles are non-justiciable in nature. They are not enforceable by the courts for their violation.
- The purpose of Directive Principles is to promote the notion of social and economic democracy. They seek to develop "welfare state" in India.
- The Directive Principles of State Policy are categorised into three broad categories, viz, socialistic, Gandhian and liberal-principles.
- Right to Adequate Livelihood is a Directive Principle and falls under the category of socialistic principles.
- Article 39 of DPSP states about the right to adequate means of livelihood for all citizen.

9. Option (d) is correct.

Explanation:

The Supreme Court is empowered by Constitution of India to issue writs.

The following are the writs issued by Supreme Court for the enforcement of the fundamental rights of an aggrieved person:

1. Habeas Corpus
2. Mandamus
3. Prohibition
4. Quo Warranto
5. Certiorari

10. Option (c) is correct.

Explanation:

List of Fundamental Rights

Article 21A: Right to elementary education.

Article 30: Right of minorities to establish and administer educational institutions.

Article 17: Abolition of untouchability and prohibition of its practice

Article 18: Abolition of titles except military and academic.

11. Option (a) is correct.

Explanation:

Functions of Constitution of India

- To Provide a set of basic rules
- To specify/mention who has the power to make decisions in a society. It determines how the government will be constituted.
- To put some limits on what a government can impose on its citizens.
- To allow the government to fulfil the aspirations of a society and create conditions for a just society
- To specify certain fundamental rights for citizens in order to limit the power of government.

12. Option (d) is correct.

Explanation:

Biodiversity is the occurrence of wide variety of organisms on earth. Biodiversity term was coined by Walter G. Rosen in 1986. Biodiversity is nowadays conserved in biodiversity hotspots. Hotspot term was coined by Norman Myers in 1988. Biodiversity Hotspots are the areas having richest biodiversity along with high degree of endemism. Worldwide there are total 36 Hotspots are identified. In India, there are total 4 Hotspots are present.

13. Option (c) is correct.

Explanation:

Terrestrial Radiation

The insolation (amount of solar radiation) received by the Earth is in the form of **short waves** and heats up its surface. The Earth becomes a radiating body after being heated itself and **it radiates energy to the atmosphere in long wave form**. This energy heats up the atmosphere from below and this process is known as terrestrial radiation.

The **long wave radiation** is then absorbed by the atmospheric gases particularly by carbon dioxide and the other green house gases and this is how the atmosphere of Earth gets heated up.

14. Option (b) is correct.

Explanation:

Layers of earth's atmosphere

1. **Troposphere** (lowest part of the atmosphere)
2. **Stratosphere** (above the troposphere lies the stratosphere)
3. **Mesosphere** (third layer of the atmosphere)
4. **Thermosphere** (fourth layer of atmosphere, helps in radio transmission)
5. **Exosphere** (upper most layer of the atmosphere)

15. Option (d) is correct.

Explanation:

Soil is the mixture of organic materials and debris of rock which develop on the surface of Earth.

The major factors affecting the formation of soil are

- Relief or topography
- Parent material
- Climate
- Vegetation and other life-forms.
- Time

16. Option (c) is correct.

Explanation:

The rigid/solid outer part of the Earth which consist of the crust and upper mantle is called lithosphere.

Lithosphere is divided into-

- Oceanic lithosphere: huge water bodies
- Continental lithosphere: large landmasses

17. Option (d) is correct.

Explanation:

- Bhutan has the maximum difference of 6 hours and 0 minutes from Greenwich Mean Time.
- India is 5 hours 30 minutes ahead of Greenwich Mean Time.

18. Option (d) is correct.

Explanation:

Features of India Constitution

- Constitution of India is considered as supreme law of the land. Any laws made by the state or union government which is violating any of the provisions of the Constitution will be considered void.

- It provides for basic set of rules in order to allow minimal coordination amongst the members of a society.
 - The constitution has specified the powers of government. It checks the arbitrary power of government and has set some limits on what a government can impose on its citizens by introducing fundamental rights.
 - Indian constitution provides for judicial review. Judicial review does not mean supremacy of the judiciary, but of the Constitution.
19. **Option (a) is correct.**
Explanation:
 Attorney General of India
- The Attorney General of India is the highest law officer in the country.
 - Article 76 has provided for the office of the Attorney General.
 - The Attorney General has the right of audience in all courts established in the territory of India.
 - He has the right to speak and take part in the proceedings of either House or any joint sitting of both the Houses.
 - He is appointed by the president.
 - He must be a person who is qualified to be appointed as a judge of the Supreme Court.
 - The remuneration of the AG is not fixed by the Constitution.
 - The President of India determines the remuneration of the Attorney General.
 - He can give advice to the Government of India only on such legal matters which are referred to him by the president.
20. **Option (d) is correct.**
Explanation:
 Directive Principles of State Policy are included in the Part IV of the Constitution from Articles 36 to 51.
 The Directive Principles of State Policy is a 'novel feature' of the Indian Constitution, according to Dr. B.R. Ambedkar.
21. **Option (a) is correct.**
Explanation:
 Provisions of the Indian Councils Act 1861
- The Governor-General's Council was enlarged for legislative purposes. The additional members were to be between 6 and 12 (nominated by the Governor-General). They were authorised to increase the members.
 - Out of these, at least half of the additional members were to be non-official either British or Indian. They were to be appointed for a period of 2 years.
22. **Option (a) is correct.**
Explanation:
 Tattvabodhini (truth-searching) Patrika was established by Debendranath Tagore on 16 August 1843.
 It get published in Bengali and was devoted to the systematic study of India's past with a rational outlook and to the propagation of Raja Ram Mohan's ideas.
23. **Option (d) is correct.**
Explanation:
 The Santhals were given land and persuaded to settle in the foothills of Rajmahal Hills (Jharkhand)
 By 1832 a large area of Rajmahal Hills was demarcated as *Damin-i-Koh* (or simply Damin) by British. This area was declared to be the land of the Santhals.
24. **Option (a) is correct.**
Explanation:
 The Tropic of Cancer passes through eight states in India.
1. Gujarat
 2. Rajasthan
 3. Madhya Pradesh
 4. Chhattisgarh
 5. Jharkhand
 6. West Bengal
 7. Tripura
 8. Mizoram
25. **Option (c) is correct.**
Explanation:
 Food crops – Wheat, Rice, Ragi, Corn, millets
 Plantation crops - tea, coffee, rubber, coconut
 Cash crop - jute, oilseeds, and tobacco
26. **Option (d) is correct.**
Explanation:
List of coalfields in Jharkhand:
- Jharia coalfield

- Ramgarh Coalfield
- Deogarh Coalfield

Umaria Coalfield: It is located in Umaria district in Madhya Pradesh.

27. **Option (d) is correct.**

Explanation:

The Equator

- It is an imaginary line that divides the Earth into two hemispheres, i.e., the Northern Hemisphere and the Southern Hemisphere.
- It is also the circle that is equidistant from the North Pole and South Pole.
- All the parallel circles from the equator up to the poles are called parallels or circles of latitudes. Latitudes are measured in degrees.
- The Equator is the longest of all the parallels or circles of latitude.

28. **Option (c) is correct.**

Explanation:

- The rhythmic/periodic rise and fall of ocean water twice in a day is called a tide.
- Tides are caused by the strong gravitational pull exerted by the sun and the moon on the surface of earth.
- The water of the Earth which is closer to the moon gets pulled due to the moon's gravitational force and results in high tide.
- The Sun, the Moon and the Earth are in the same line during the full moon and new moon days, during these days the tides are highest. These tides are called spring tides.

29. **Option (c) is correct.**

Explanation:

The Indian Factory Act, 1881

- It dealt mainly with the problem of child labour (between 7 and 12 years of age).
- It prohibited employment of children under 7 years of age.
- It restricted working hours to 9 hours per day for children.
- It made a provision of granting children a holiday of four days in a month.

30. **Option (c) is correct.**

Explanation:

- Gandhi always had in mind the goal of eradicating untouchability completely.
- His ideas were based on the grounds of reasons and humanism.

- He argued that the Shastras did not endorse untouchability and, even if they did, they should be disregarded because truth cannot be contained inside the pages of a book.

- In 1932, he founded the All-India Harijan Sangh for this purpose.

31. **Option (d) is correct.**

Explanation:

Paramahansa Mandali

- It was a secret socio-religious group which was founded in 1840 in Bombay.
- The Mandali was started by Durgaram Mehtaji, Dadoba Pandurang and a group of his friends.
- The founders of this Mandali believed in one God and they were primarily interested in breaking caste rules.
- The members used to eat food cooked by people of lower caste and they also advocated women's education and widow remarriage.

32. **Option (b) is correct.**

Explanation:

The vision of unity during Sepoy Mutiny or revolt of 1857

- The rebel proclamations in 1857 repeatedly requested to all sections of the population, irrespective of their caste and creed to unite, rise and exterminate the firangis
- The ishtahars (notification) remembered the pre-British Hindu-Muslim past and glorified the coexistence of different communities under the Mughal Empire.
- The proclamation issued in Bahadur Shah's name urged people to fight under the standards of both of Muhammad and Mahavir.

33. **Option (c) is correct.**

Explanation:

The flying shuttle loom was designed by John Kay in 1733. This loom made it possible to weave broader fabrics in less time and consequently called for more yarn than could be supplied at the current rate of spinning.

34. **Option (a) is correct.**

Explanation:

Hirakud Dam: It is located in Sambalpur, Odisha. It is built across the Mahanadi River and is the longest earthen dam in the world.

Panchet Dam: It is located in Dhanbad District, Jharkhand and is built across the Damodar River.

Kosi Dam: It is also known as Saptakosi High Dam. It is constructed on the Saptakoshi River of Nepal. Its objective was to control floods in south-east Nepal and northern Bihar.

Ukai Dam: It is the largest reservoir of Gujarat. It is constructed across the Tapi River and is also known as Vallabh Sagar.

35. **Option (b) is correct.**

Explanation:

The river twists and turns as it enters the plain, forming huge bends known as meanders. The ends of meander loop come closer and closer due to constant erosion and deposition along the sides of meander.

Consequently in due course of time, the meander loop cuts off from the river and forms a cut-off lake which is known as ox-bow lake.

36. **Option (d) is correct.**

Explanation:

The following are the important features of agriculture in India:

- Subsistence agriculture
- Pressure of population on agriculture
- Dependence on Monsoon
- Predominance of food crops
- Seasonal pattern
- Importance of animals

37. **Option (b) is correct.**

Explanation:

The National Livestock Mission (NLM) scheme

- It is being implemented in the country since 2014. The scheme aims towards the, entrepreneurship development, employment generation and increase in per animal productivity

Sub-missions of NLM are:

- Breed Development of Livestock and Poultry
- Feed and Fodder Development
- Innovation and Extension.

38. **Option (c) is correct.**

Explanation:

- The book "Discourse on Political Economy" was written by Jean-Jacques Rousseau

- The contains the permanent classic of political theory and is a key source of democratic belief.

39. **Option (b) is correct.**

Explanation:

A special session of the Congress was held at Karachi in March 1931 to endorse the Gandhi-Irwin Pact. Six days prior the session Bhagat Singh, Sukhdev and Rajguru were executed.

Two resolutions were adopted in the Karachi Session

- One on Fundamental Rights
 - Other on National Economic Programme
- The resolution had 20 points agenda which included:
- Elections on the basis of Universal Adult Franchise
 - Basic civil rights of freedom of speech
 - Right to form associations, among others

40. **Option (a) is correct.**

Explanation:

A Law Commission was set up in 1833 under the chairmanship of Lord Macaulay for codification of Indian laws.

As a result of this commission, following codes were prepared

- Civil Procedure Code (1859)
- Indian Penal Code (1860)
- Criminal Procedure Code (1861)

41. **Option (b) is correct.**

Explanation:

- Ngangom Dingko Singh was an Indian Boxer from Manipur.
- He had won the gold medal at 1998 Asian Games held in Bangkok.
- He was awarded the Padma Shri in 2013 by Government of India.
- He died after a long battle with liver cancer.

42. **Option (d) is correct.**

Explanation:

Vinoo Mankad

- He was an Indian cricketer.
- He had appeared in 44 Test matches for India between 1946 and 1959.
- Mankading (run-out) in cricket is named after him.

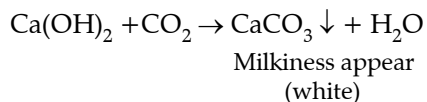
- In June 2021, he was inducted into the ICC Cricket Hall of Fame ahead of the 2021 ICC World Test Championship final.
43. **Option (a) is correct.**
Explanation:
Group of Seven (G7)
- It comprises seven countries - Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.
 - It is not based on any treaty and does not have permanent secretariat or office.
 - Its presidency rotates annually among the member states and for 2022 Germany is holding the presidency.
 - Several democratic countries – India, Spain, Indonesia and Poland participate as observers.
44. **Option (b) is correct.**
Explanation:
- The Indian Coast Guard's Operation Olivia aims to conserve the Olive Ridley turtle population during its breeding season, which runs from December to May.
 - It takes place off the coast of Odisha which is the primary habitat range of the turtles.
45. **Option (a) is correct.**
Explanation:
2021 French Open
- Novak Djokovic defeated Stefanos Tsitsipas in the final to win the men's singles tennis title at the 2021 French Open. It was his second French Open title.
46. **Option (c) is correct.**
Explanation:
 Rebeca Grynspan
- She is a Costa Rican economist.
 - Since 13 September 2021, she is serving as Secretary General of the United Nations Conference on Trade and Development (UNCTAD).
 - She was also the Vice President of Costa Rica from 1994 to 1998.
47. **Option (a) is correct.**
Explanation:
 Belt and Road Initiative
- It was formerly known as One Belt One Road
- It is a global infrastructure development strategy adopted in 2013 by the Chinese government.
 - It aims to invest in nearly 70 countries and international organizations.
48. **Option (c) is correct.**
Explanation:
 International Yoga Day 2021
- It is celebrated every year on June 21. It has been celebrated since 2015.
 - Theme for 2021 - Yoga for well-being
49. **Option (c) is correct.**
Explanation:
 Kenneth David Kaunda served as the first President of Zambia from 1964 to 1991. He passed away on 14 June 2021.
50. **Option (b) is correct.**
Explanation:
- The 2021 maiden IN – EUNAVFOR Joint Naval Exercise was held in the Gulf of Aden.
 - Along with India Navy, other naval forces from Italy, Spain and France also participated.
51. **Option (c) is correct.**
Explanation:
 Milk of magnesia is an aqueous solution of $Mg(OH)_2$.
 $Mg(OH)_2$ is a weak base which does not dissociate 100% into the solution, due to which aqueous solution contains less number of $-OH$ ions. $Mg(OH)_2$ being base having pH greater than 7.0.
 As number of $-OH$ ions in the solution are less in number
 \therefore pH is less. Hence the correct option will be 10
52. **Option (b) is correct.**
Explanation:
 In photographic plate, AgBr is used which is a photo sensitive compound. On exposure to sunlight AgBr get dissociated to form greyish black Ag and Br_2
- $$2AgBr \xrightarrow{h\nu} 2Ag + Br_2$$
53. **Option (d) is correct.**
Explanation:
 Ferrous sulphate crystal contains seven number of water molecule which are known as water of crystallization. It is also known

as Ferrous sulphate heptahydrate or green vitriol. The colour of ferrous sulphate is green in colour and the green colour is due to the presence of water of crystallisation.

54. **Option (c) is correct.**

Explanation:

Lime water is an aqueous solution of calcium hydroxide $[\text{Ca}(\text{OH})_2]$. On passing CO_2 gas through lime water, milkiness appear due to the formation of calcium carbonate $[\text{CaCO}_3]$.



55. **Option (b) is correct.**

Explanation:

Both mercury and Bromine are liquid in state at normal temperature and pressure.

Mercury is a denser liquid and Bromine is reddish brown coloured liquid.

56. **Option (b) is correct.**

Explanation:

A mixture of salt and anthracene can be easily separated by sublimation. Sublimation is a process in which a volatile substance can be easily separated in the form of vapours via heating.

Among salt and anthracene is a sublimable substance which directly converted form solid to gas on heating.

57. **Option (d) is correct.**

Explanation:

Phototropism is the movement of plant parts towards or against light source.

Chemotropism is movement towards or against chemical source.

Hydrotropism is movement towards or against water source.

Geotropism is movement towards or against gravity.

Positive tropism is the movement towards the source and negative tropism is the movement against the source.

So the movement of shoots of plant in upward direction is negatively geotropic as it is against the gravity movement.

58. **Option (d) is correct.**

Explanation:

Photosynthesis is the biochemical process of synthesis of carbohydrates using the raw

materials like CO_2 and H_2O in the presence of sunlight with the help of chlorophyll.

In photosynthesis, CO_2 is reduced to carbohydrates and water molecule is splitted in the presence of sunlight. In the water splitting complex, H^+ ions are obtained and it is used for the reduction purpose and simultaneously O_2 is released as a by - product.

59. **Option (d) is correct.**

Explanation:

Gymnosperms are the woody plants having vascular tissues like xylem and phloem for the conduction of water and food, respectively and also they bear seeds without flowers i.e. naked seeds. So in the gymnosperms, ovules are not enclosed by any ovary wall and remain exposed, both before and after fertilization.

Angiosperms are vascular plants with xylem and phloem. These are seed bearing flowering plants. Angiosperm are further classified into monocots and dicots.

60. **Option (b) is correct.**

Explanation:

Parenchyma is type of simple permanent tissue found in plants. Parenchyma cells are variable in shape with intercellular spaces. It is a major packing tissue present in plants which supports the organs of plants and fills the gaps between other tissues.

Parenchyma is also present in xylem as xylem parenchyma and also present in phloem as phloem parenchyma. It also helps in radial conduction of water, storage of food and other plant metabolites.

61. **Option (b) is correct.**

Explanation:

Plant growth is indefinite as it keeps on growing through meristems. The primary growth results in the increase in length due to the activity of apical and intercalary meristems. The secondary growth results in the increase of girth due to the activity of lateral meristems. Lateral meristem includes vascular cambium and cork cambium. The vascular cambium is present in between the vascular bundles and divide to add new layers of secondary tissues like secondary xylem and secondary phloem. Due to the addition of these new layers, the girth of plant increases.

62. **Option (c) is correct.**

Explanation:

Different varieties of same gene are called alleles.

The Genotype is the genetic constitution of an organism.

Sib pairs is a technique used in genetics to discover the diseases with an unclear mode of inheritance and has been used successfully in studies of other complex disorders.

Isomers are the chemical compounds which have same empirical formula but differ in arrangement of their atoms.

63. **Option (b) is correct.**

Explanation:

Variola virus causes small pox. Small pox is a contagious and deadly disease. It shows symptoms like fever, and appearance of flat, red spots on whole upper body which turns into small blisters filled with clear fluid and after sometime it gets filled with pus.

There is currently no cure, but only a vaccine could have prevented it.

64. **Option (d) is correct.**

Explanation:

When an object is immersed in a fluid, fluid exerts pressure on all the surface of the object. As fluid pressure increase with depth, the pressure exerted by the fluid is more at the bottom surface of object than that at top surface. This extra upward force is the reason behind buoyancy.

65. **Option (b) is correct.**

Explanation:

Mass of an object is the amount of matter present in it. Mass does not depend upon geography, time or any external force and can be treated as a constant. While weight is the result of action of gravity on object, it changes with change in gravity.

According to Newton's second law,

$$F = \frac{dp}{dt} \text{ or } \frac{d(mv)}{dt}$$

$$F = m \frac{dv}{dt} + v \frac{dm}{dt}$$

As discussed above mass for non relativistic motion is constant $\frac{dv}{dt} = 0$.

$$\Rightarrow F = m \frac{dv}{dt}$$

$$\text{Or } F \propto \frac{dv}{dt}$$

66. **Option (d) is correct.**

Explanation:

Fundamental laws of physics require conservation of energy, momentum and charge.

Kirchhoff's law requires conservation of energy and charge. Newton's 2nd law can be expressed using conservation of momentum while all the thermodynamic principles are based on conservation of energy (mass+ energy).

67. **Option (a) is correct.**

Explanation:

Work done, $W = Fs$

(a) $F = 4 \text{ N}, s = 0.25 \text{ m}; W = 4 \times 0.25 = 1 \text{ N}$

(b) $F = 2 \text{ N}, s = 1 \text{ m}; W = 2 \times 1 = 2 \text{ N}$

(c) $F = 1 \text{ N}, s = 0.01 \text{ m}; W = 1 \times 0.01 = 0.01 \text{ N}$

(d) $F = 1 \text{ N}, s = 0.50 \text{ m}; W = 1 \times 0.5 = 0.5 \text{ N}$

68. **Option (b) is correct.**

Explanation:

When an object undergoes circular motion, speed remains same but its direction changes continuously. Due to change in direction of speed its velocity changes at every point.

Since, momentum depends upon velocity, so it also changes.

69. **Option (a) is correct.**

Explanation:

For parallel connection,

$$\frac{1}{R_{\text{eq}}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$$

$$\frac{1}{R_{\text{eq}}} = \frac{1}{R} + \frac{1}{R} + \frac{1}{R} = \frac{3}{R} \quad (\because R_1 = R_2 = R_3 = R)$$

$$R_{\text{eq}} = \frac{R}{3}$$

70. **Option (c) is correct.**

Explanation:

Rutherford's α -scattering experiment is mainly responsible for the discovery of nucleus. The experiment concluded that, in an atom positive charge remains concentrated at the center which is called atomic nucleus and the volume occupied by the nucleus is very

small compared to the volume occupied by an atom.

71. **Option (c) is correct.**

Explanation:

According to Bohr's atomic model, electrons revolve around the nucleus in a circular orbit whose energy is fixed.

The number of orbit are assigned as

Name of shell	=	K	L	M	N
Number	=	1	2	3	4

According to principal Quantum number (n), the maximum number of electrons in an orbit = $2n^2$

Here for M – shell, the value of n = 3

$$\begin{aligned} \text{So maximum no. of electrons in M – shell} &= 2 \times (3)^2 \\ &= 18 \end{aligned}$$

72. **Option (b) is correct.**

Explanation:

Formula used

Average atomic mass

$$= \frac{\sum \% \text{abundance} \times \text{atomic mass}}{\sum \% \text{abundance}}$$

Here atomic mass of Cl = 35 and 37

% abundance of Cl = 3 and 1

So Average atomic mass of chlorine atom

$$\begin{aligned} &= \frac{3 \times 35 + 37 \times 1}{3 + 1} = \frac{105 + 37}{4} \\ &= 35.5 \end{aligned}$$

73. **Option (c) is correct.**

Explanation:

Cobalt – 60 is mainly used in the treatment of cancer.

74. **Option (b) is correct.**

Explanation:

To protect iron from rusting, electroplating of iron takes place. The electroplating of that metal takes place on iron which is more reactive than it. For electroplating electrolytic cell is formed in which zinc is made as anode while iron act as cathode. On passing electricity, from anode Zn moves towards cathode and layer of Zn is deposited at iron.

75. **Option (c) is correct.**

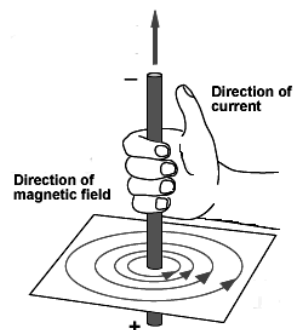
Explanation:

Cinnabar is sulphide ore of mercury whose molecular formula is HgS.

76. **Option (c) is correct.**

Explanation:

To find the direction of magnetic field or current, we use right hand thumb rule. So options (b) and (d) are incorrect. If we curl our fingers in the direction of magnetic field lines, direction of thumb will represent the direction of current, which is upward as shown in figure.



77. **Option (b) is correct.**

Explanation:

Generator converts mechanical energy into electrical energy (current), while motor consumes electrical energy and produces mechanical energy.

Ammeter and galvanometer are the current measuring instruments.

78. **Option (c) is correct.**

Explanation:

Myopia or near-sightedness occurs when light rays coming from a distant object, converge before the retina. Hence, we get blurred image of distant objects.

79. **Option (a) is correct.**

Explanation:

Tyndall effect takes place when light is scattered by the colloidal particles. Due to this scattering, path of light becomes visible.

80. **Option (a) is correct.**

Explanation:

Twinkling of stars is an atmospheric phenomenon. Due to varying refractive index of layers of atmosphere a light ray coming from a star undergoes multiple refractions. Hence, stars appear to twinkle.

81. **Option (d) is correct.**

Explanation:

Cornea is a transparent layer covering the front part of an eye. It covers pupil, iris and anterior chamber.

Light enters an eye through cornea.

Cornea is composed of protein and cells. It does not contain blood vessels.

82. **Option (c) is correct.**

Explanation:

$$\text{Power of lens, } P = \frac{1}{f}$$

$$P = \frac{1}{0.25 \text{ m}} = +4 \text{ D}$$

83. **Option (a) is correct.**

Explanation:

Ruminant animals generally contains four chambers stomach which is called as compound stomach. Animals like cattles, sheep, deer, goat, has four chambered stomach while, camel has 3 chambered stomach. Four chambers of stomach are rumen, reticulum, omasum and abomasum.

Out of these four chambers, abomasum is the true stomach.

84. **Option (c) is correct.**

Explanation:

Intestine harbours numerous friendly bacteria which produces Vit -B₁₂ and Vit - K. These are symbiotic bacteria.

85. **Option (b) is correct.**

Explanation:

Estrogen is a female sex hormone which helps in the development of female sexual characters. Estrogen makes the female body more feminine by making their hips and pelvis wider, development of breast and uterus. Estrogen is also responsible for the production of hairs in armpits and groin areas.

86. **Option (a) is correct.**

Explanation:

$$\text{From mirror formula, } \frac{1}{f} = \frac{1}{u} + \frac{1}{v}$$

$$\text{When } f = \infty, \quad \frac{1}{\infty} = \frac{1}{u} + \frac{1}{v}$$

$$\Rightarrow \quad 0 = \frac{1}{u} + \frac{1}{v}$$

$$\Rightarrow \quad v = -u$$

We can clearly see, object and image are equidistant. Here, -ve sign indicates both object and image are at opposite side, which is the case for a plane mirror.

Hence, we can say, a plane mirror is a spherical mirror with infinite focal length.

87. **Option (a) is correct.**

Explanation:

In nuclear fission reaction, a heavy nucleus splits into two or more than two smaller and stable nuclei, releasing very high amount of energy. Its expression ($E = \Delta mc^2$) was proposed by the Albert Einstein. The expression also holds true for nuclear energy released in nuclear fusion reaction.

88. **Option (b) is correct.**

Explanation:

Reverberation is the persistence of sound even after original sound has lapsed. It occurs due to multiple reflection of sound wave and as a result the brain treats the reflected waves as a continuous wave.

89. **Option (b) is correct.**

Explanation:

Sound wave is a mechanical wave, which needs medium to travel. Hence, it cannot travel through vacuum.

In sound wave disturbance in the medium occurs in the direction of propagation of wave, hence sound is longitudinal in nature.

90. **Option (d) is correct.**

Explanation:

$$\text{Maximum height attained, } H = \frac{u^2}{2g}$$

$$20 = \frac{u^2}{2 \times 10}$$

$$\Rightarrow \quad u^2 = 400$$

$$\Rightarrow \quad u = \pm 20 \text{ m/s}$$

91. **Option (a) is correct.**

Explanation:

$$\text{Here, } m = 2 \text{ kg, KE} = 100 \text{ J, } v = ?$$

$$\text{KE} = \frac{1}{2} m v^2$$

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

$$\Rightarrow \quad v^2 = 100$$

$$\Rightarrow \quad v = 10 \text{ m/s}$$

92. **Option (d) is correct.**

Explanation:

Isoelectronic species are those species in which number of electrons are same.

Here, in F^- number of electrons are 10.

Elenents	Atomic No	Species	Number of e^-
O	8	O^{2-}	$8 + 2 = 10$
Na	11	Na^+	$11 - 1 = 10$
Ne	10	Ne	10
N	7	N^-	$7 + 1 = 8$

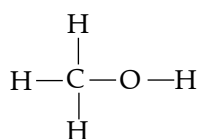
Here, N^- do not have similar electrons than F^- . It is not an isoelectronic species.

93. **Option (c) is correct.**

Explanation:

The molecular formula of methanol is CH_3OH

The structural formula of methanol is as follows—



From the structure, it is clear that the number of covalent bond in methanol = 5

Short cut \Rightarrow number of covalent bond = (Total number of atom) - 1

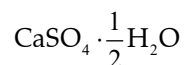
In methanol, total number of atoms = 6

So number of covalent bond = $6 - 1 = 5$

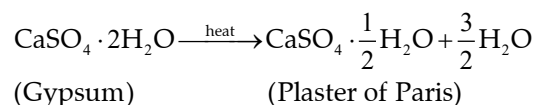
94. **Option (a) is correct.**

Explanation:

The chemical formula of plaster of Paris =



It is also known as calcium sulphate semihydrate. Plaster of Paris can be obtained by heating gypsum.



95. **Option (a) is correct.**

Explanation:

$$\frac{\text{Thrust}}{\text{Impulse}} = \frac{F}{F \times t} = \frac{1}{t}, \text{ this is the unit of frequency.}$$

Hence option (a) is correct.

96. **Option (a) is correct.**

Explanation:

A ray of light does not travel straight after it strikes on a prism surface, unless it strikes perpendicularly. In options (b) and (c) light is traveling straight inside a prism and in option (d), it is coming out from prism without deviation. So options (b), (c) and (d) are wrong.

As light enters into denser medium, it moves closer to normal, while it moves away from the normal when it enters into rare medium. This is happening in option (a), hence it is correct.

97. **Option (c) is correct.**

Explanation:

Refractive index of prism for a particular light

$$\propto \frac{1}{\text{wavelength}}$$

Since wavelength of violet light is least, refractive index for violet light is maximum. Hence, it will deviate most while red color will deviate the least.

98. **Option (b) is correct.**

Explanation:

A plane mirror always forms a virtual and erect image of same size, and at the same distance as object.

99. **Option (a) is correct.**

Explanation:

Work done under the action of a conservative force depends only upon initial and final position of an object, and is independent of the path. Friction is a surface phenomenon, so it is not a conservative force.

100. **Option (c) is correct.**

Explanation:

Work done by an object, $W = FS \cos \theta$

If $90^\circ < \theta < 270^\circ$, then $\cos \theta < 0$, which means W is negative.

When both F and S are antiparallel, angle between them is 180° ($\cos 180^\circ = -1$) which means work done is negative in this case.