NDA / NA

National Defence Academy / Naval Academy

GENERAL ABILITY TEST

II

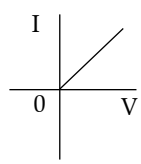
QUESTION PAPER 2023

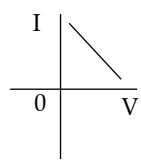
Time : 1 hr 40 min **Total Marks: : 400**

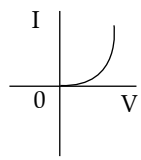
Instructions

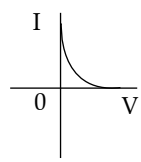
1. *This Test Booklet contains **100** items (questions). Each item comprises four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **ONLY ONE** response for each item.*
2. *You have to mark all your responses **ONLY** on the separate Answer Sheet provided. See directions in the Answer Sheet.*
3. ***All** items carry equal marks.*
4. *Before you proceed to mark in the Answer Sheet the response to the 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. The streaming of light beams coming from the Sun through trees is said to have suggested that light travels in straight line. The particles on the path of light beams are visible to us because
   (a) dust particles in the air reflect light into our eyes
   (b) dust particles in the air scatter light into our eyes
   (c) dust particles in the air refract light into our eyes
   (d) dust particles in the air polarize light into our eyes
2. The flash of lightning is seen before the thunderstorm is heard. It verifies that
   (a) sound travels much faster than light
   (b) light travels much faster than sound
   (c) light and sound both travel with same speed
   (d) intensity of flash of lightning is very high during thunderstorm
3. The potential difference between the two end terminals of an electric heater is 220 V and the current through it is 0.5 A. What would be the current through the heater if the potential difference across the terminals of the heater is reduced to 120 V ?
   (a) 1.0 A (b) 0.5 A
   (c) 0.27 A (d) 0.7 A
4. The heating element in an electric iron is usually made of
   (a) Constantan (b) Tungsten
   (c) Nichrome (d) Copper
5. Sita, 1·5 m high, stands before a plane mirror fixed on a wall to view her full image. What should be the minimum height of the plane mirror so that Sita can view her image fully?
   (a) 0·50 m (b) 0·35 m
   (c) 0·75 m (d) 0·25 m
6. Galvanization is a method of protecting iron from rusting by coating with a thin layer of
   (a) Gallium (b) Aluminum
   (c) Zinc (d) Silver
7. Which one of the following alloys contains a non-metal as one of its constituent?
   (a) Brass (b) Bronze
   (c) Amalgam (d) Steel
8. Buckminster fullerene, which looks like a football, is an allotropic form of
   (a) Phosphorus (b) Sulfur
   (c) Carbon (d) Tin
9. Which one of the following graphs correctly represents the current (I) voltage (V) variation for a rectangular piece of a semiconductor wafer?

(a) 

(b) 

(c) 

(d) 

10. The green plants in a terrestrial ecosystem absorbs sunlight that falls on their leaves and convert it into food energy. The percentage of solar radiation absorbed by all green plants for the process of photosynthesis is about
(a) 1% (b) 5%
(c) 8% (d) 10%

11. Consider the following reaction:
$Fe_2O_3(s) + 2Al(s) \rightarrow 2Fe(s) + Al_2O_3(s)$
Which of the following statements about the given reaction is NOT correct?
(a) It is an example of displacement reaction
(b) It is highly endothermic reaction
(c) Fe_2O_3 acts as oxidizing agent .
(d) This reaction is applicable to joining of railway tracks .

12. Match List I with List II and select the correct answer using the code given below the Lists :

List I (Chemical process)	List II (Reaction)
A. Electrolysis of water	1. Double displacement reaction
B. Burning of coal	2. Combination reaction
C. Iron nail immersed in copper sulphate solution	3. Decomposition reaction
D. Addition of barium chloride solution to aluminium sulphate solution	4. Displacement reaction

Code:

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

13. Which one of the following processes involves chemical reaction?
(a) Evaporation of petrol
(b) Dissolution of salt in water
(c) Storing of oxygen gas under pressure in a gas cylinder
(d) Burning of magnesium ribbon in aIr

14. Which one of the following metals does NOT react with cold water to liberate hydrogen gas ?
(a) Potassium (b) Iron
(c) Calcium (d) Sodium

15. Consider the following reaction:
$2HgO \xrightarrow{\Delta} 2Hg + O_2$
The respective state of HgO, Hg and O_2 in the above reaction is
(a) Liquid, solid, gas (b) Solid, solid, gas
(c) Liquid, solid, liquid (d) Solid, liquid, gas

16. The two important features of sexual reproduction in higher organisms that create genetic diversity in offspring are
(a) Mitosis and fertilization
(b) Meiosis and fertilization
(c) Mitosis and binary fission
(d) Meiosis and conjugation

17. Eukaryotic cells are much more complex as compared to prokaryotes. Which one of the following structures is exclusively present in a eukaryoticcell ?
(a) Cell wall
(b) Plasma membrane
(c) Nucleic acid
(d) Mitochondria

18. An important cause of tooth decay by the bacterium *Streptococcus* mutans is because of their ability to attach to teeth surface by producing slime layer from
(a) Sugar (b) Alcohol
(c) Saliva (d) Teichoic acid

19. In angiosperms, pollen grain germinates to produce two male gametes. Which one of the following functions is carried out by these gametes?
(a) Both the gametes fuse with a single egg cell
(b) Both the gametes fuse with two different egg cells
(c) One gamete fuses with the egg cell and the other one eventually degenerate
(d) One gamete fuses with the egg cell and the other one fuses with a diploid secondary nucleus

20. In a sexually reproducing organism, which one of the following statements is appropriate both for the parent and offspring?
(a) Chromosome number increases but DNA content remains constant
(b) Both chromosome number and DNA content remains constant
(c) Chromosome number decreases but DNA content remains constant
(d) Both chromosome number and DNA content decreases

21. Relationship between a flower and honey-bee will help the flower for/in
(a) Faster development
(b) Pollination
(c) Quick germination of pollen
(d) Increase in size

22. Which one of the following was NOT a way in which kings in ancient India attempted to claim a higher status?
(a) Identifying with a variety of deities
(b) Assuming pompous titles

(c) Imposing high taxes
(d) Conquests and annexation of territories

23. Which one of the following statements about the Bhakti movement is NOT correct?
(a) The Bhakti movement avoided traditions that promoted diversity
(b) In northern India, the Bhakti movement revolved around the worship of Rama and Krishna
(c) The Bhakti movement relied on the devotion of God, both with and without attributes
(d) While Tulsidas represented the tradition of devotion with attributes, Sant Kabir followed the path of devotion without attributes

24. The 'Reign of Terror' in revolutionary France referred to
(a) Bands of revolutionaries moving around to terrorize people who did not participate in the revolution
(b) The royal forces punishing people who participated in the revolution
(c) Trial and beheading persons considered enemies of the republic by the revolutionary tribunal
(d) The general atmosphere of insecurity perceived by people after the beheading of the king

25. In which one of the following ways did the First World War Not impact Europe?
(a) From a continent of creditors it turned into a continent of debtors
(b) Soldiers came to be placed higher in social status than civilians
(c) Popular support decreased for conservative dictatorship which had come into being recently
(d) National honor occupied center stage in the public sphere

26. "...the immediate ending of British rule in India is an urgent necessity..." was a resolution of
(a) Non Co-operation Movement
(b) Quit India Movement
(c) Individual Movement
(d) Civil Disobedience Movement

27. Which one among the following pairs of mine and mineral is NOT correctly matched?
(a) Bailadila : Iron Ore
(b) Zawar : Zinc
(c) Ghatsila : Copper
(d) Kudremukh : Bauxite

28. Which one of the following is the usual unit of measurement for Air Pressure used in India ?
(a) Centimeter (b) Millibar
(c) Milligram (d) Milliliter

29. Which one of the following is the oldest era in Geological. Geological History determining the age of various rock types?
(a) Precambrian (b) Mesozoic
(c) Cenozoic (d) Paleozoic

30. A geographical grid has :
1. Lines that run east to west around the globe to mark latitude
2. Lines that run north to south from north pole to south pole indicate longitude

Which of the statements given above is/ are correct?
(a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

31. In which one of the following layers of the atmosphere all weather phenomena occur?
(a) Mesosphere (b) Troposphere
(c) Thermosphere (d) Stratosphere

32. In which one of the following states 'Roopkund' lake located?
(a) Kerala (b) Manipur
(c) Himachal Pradesh (d) Uttarakhand

33. Ram records the odometer readings of his car for the distance covered from 2000 km at the start of his journey and 2400 km at the end of the journey after 8 hours. What is the average speed of the car?
(a) 50 km/h (b) 60 km/h
(c) 70 km/h (d) 80 km/h

34. Ms. Rani decides to convert her AC generator into a DC generator. Which one of the following she would need to use?
(a) A split-ring type commutator
(b) Slip rings and brushes
(c) A stronger magnetic field
(d) A rectangular wire loop

35. Ramesh cannot see distinctly objects kept beyond 2 m. This defect can be corrected by using a lens of power
(a) + 0.5 D (b) –0.5 D
(c) + 0.2 D (d) –0.2 D

36. Which of the following statements are correct about the electrical resistance and resistivity of a wire?
1. Both quantities depend on the area of cross-section of the wire
2. Both depend on the temperature
3. Resistance of the wire is directly proportional to the resistivity of the wire
4. Resistivity of the wire is directly proportional to the length of the Wire

Select the correct answer using the code given below:
(a) 1 and 2 (b) 1 and 3
(c) 2 and 3 (d) 2 and 4

37. A liquid is heated up to a certain temperature. Which one of the following situation would correspond to the boiling of the liquid?
(a) When atmospheric pressure becomes equal to the vapor pressure
(b) When atmospheric pressure becomes less than the vapor pressure
(c) When atmospheric pressure becomes higher than the vapor pressure

(d) When vapor pressure becomes equal to the air pressure

38. Which one of the following is NOT an example of an organic compound?
(a) Ammonium cyanate
(b) Marsh gas
(c) Urea
(d) Cane sugar

39. Which one of the following acid isused by goldsmith for cleaning of gold and silver articles ?
(a) Sulphuric acid (b) Nitric acid
(c) Hydrochloric acid (d) Phosphoric acid

40. What is the action of litmus on ethanol?
(a) Litmus is neutral towards ethanol
(b) Ethanol turns blue litmus to red; confirming acidic nature of ethanol
(c) Ethanol turns red litmus to blue; confirming basic nature of ethanol
(d) Ethanol decolorizes litmus through bleaching action

41. Which one of the following metal is NOT an essential component in stainless steel ?
(a) Iron (b) Nickel
(c) Chromium (d) Tin

42. Match List I with List II and select the correct answer using the code given below the Lists:

List I (Process)	**List II (Separation method)**
A. Separation of acetone and water from their mixture	1. Chromatography
B. Separation of water and kerosene oil from their mixture	2. Centrifugation
C. Separation of cream from milk	3. Distillation
D. Separation of pigments from plant extract	4. Separating Funnel

Code:

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

43. Which one of the following is NOT a requirement for photosynthesis ?
(a) Chlorophyll (b) CO_2
(c) Water (d) O_2

44. In flowering plants, DNA content of the parent plant gets halved during
(a) Seed germination
(b) Fruit formation
(c) Flower bud formation
(d) Pollen formation

45. Which one of the following is the correct sequence during sexual reproduction in Angiosperms ?
(a) Egg → zygote → embryo → seed
(b) Embryo → egg → zygote → seed
(c) Egg → embryo → zygote → seed
(d) Egg → seed → zygote → embryo

46. Which one of the following combinations of events represents the correct sequence during reproduction in flowering plans ?
(a) Ovule → fruit; egg → embryo; zygote → seed; ovary → egg
(b) Embryo → egg; ovary → fruit; ovule → zygote; zygote → seed
(c) Ovary → fruit; zygote → egg; embryo → ovule; seed → fruit
(d) Egg → zygote; zygote → embryo; ovule → seed; ovary → fruit

47. The book 'Nation First: The Golden Saga of 82 Years' is the history of which one of the following organizations?
(a) Indo-Tibetan Border Police
(b) Border Security Force
(c) Central Reserve Police Force
(d) Central Industrial Security Force

48. Consider the following statements regarding Sanchi and its archaeological findings:
1. When Sanchi was discovered in 1818, three of its four gateways were still standing, the fourth was lying on the spot where it had fallen
2. Animals depicted at Sanchi include elephants, horses, monkeys and cattle.
Which of the statements given above is/ are correct?
(a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) Neither 1 nor 2

49. Which Five Year Plan of India focused on rapid industrialization based growth process?
(a) First Five Year Plan
(b) Second Five Year Plan
(c) Fifth Five Year Plan
(d) Seventh Five Year Plan

50. *Chandimangala*, a sixteenth century text, was composed by
(a) Hema Saraswati
(b) Madhav Kandali
(c) Tukaram
(d) Mukundaram Chakrabarti

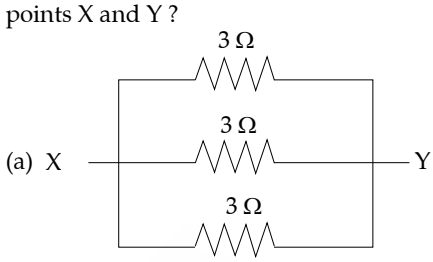
51. Consider the following statements regarding the royal center in Vijayanagara Empire:
1. The royal center was located in the south-western part of the settlement
2. It included over 60 temples
3. About 30 building complexes at the site have been identified as palaces
Which of the statements given above is/ are correct?
(a) 1 only (b) 2 only
(c) 1, 2 and 3 (d) 1 and 2 only

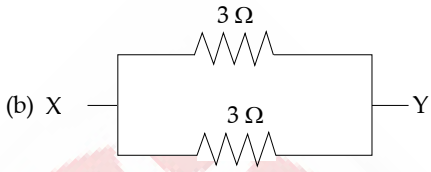
52. Which one of the following statements is NOT correct?
    (a) Area wise Madhya Pradesh is the fourth largest state in India
    (b) Hornbill festival is celebrated in Nagaland
    (c) Gujarat state contribute 7·9 percent share to the National GDP
    (d) Telangana is situated in the Deccan plateau in the central stretch of Indian peninsula
53. Which one of the following soils is ideal for growing cotton ?
    (a) Regur soil (b) Laterite soil
    (c) Desert soil (d) Mountainous soil
54. Where is the Central Institute of Buddhist Studies situated ?
    (a) Leh (b) Kullu
    (c) Ahnora (d) Gangtok
55. Consider the. following statements about physical features of India:
    1. The southern point of the Peninsular Plateau is formed by the Nilgiri Hills where the Eastern and the Western Ghats meet
    2. The Cardamom Hills may be regarded as a continuation of the Eastern Ghats

    Which of the statements given above is/are correct?
    (a) 1 only (b) 2 only
    (c) Both 1 and 2 (d) Neither 1 nor 2
56. Which one of the following is the narrow belt parallel to the Shivalik foothills where streams and rivers coming from the mountains deposit heavy materials of rocks and boulders ?
    (a) Tarai (b) Bhangar
    (c) Bhabar (d) Khadar
57. Which of the following statements about the Suez Canal is/ are correct?
    1. Suez is a man-made navigation canal
    2. Suez links the Mediterranean Sea and the Red Sea
    3. The economic significance of Suez 'Canal is less than that of Panama Canal

    Select the correct answer using the code given below :
    (a) 1 only (b) 1 and 2 only
    (c) 2 and 3 only (d) 1, 2 and 3
58. An iron nail sinks in water whereas an iron ship floats. Which of the following statements is correct in this regard?
    1. Average density of ship is greater than that of the water
    2. Average density of iron nail is greater than that of the water
    3. Average density of the ship is less than that of the water
    4. Average density of the ship is equal to that of the water

    Select the correct answer using the code given below :
    (a) 1 and 2 (b) 2 and 3
    (c) 2 and 4 (d) 1 and 4
59. Which of the following arrangement of resistors offers minimum effective resistance between points X and Y ?

    (a) 

    (b) 

    (c) 

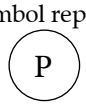
    (d) 

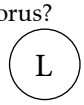
60. What will happen if a collection of positive and negative charges are passed at a high speed through a magnetic field which is perpendicular to the direction of motion of the charges? (Assume that both kind of charges are NOT going to recombine)
    (a) Both kind of charges will stop moving
    (b) Positive charges and negative charges will separate out
    (c) Positive charges will stop but negative charges will continue moving uninterrupted
    (d) Both kind of charges will keep moving uninterrupted
61. The motion of a particle of mass m is described by the relation, $y = ut - 1/2\ gt^2$, where u is the initial velocity of the particle. The force acting on the particle is
    (a) $F = m\ (du/dt)$ (b) $F = mg$
    (c) $F = m(dy/dt)$ (d) $F = -mg$
62. A block of wood (dimensions: 40 cm × 20 cm × 10 cm) is kept on a tabletop in three different positions: (a) with its side of dimensions 20 cm × 10 cm; (b) with its side of dimensions 10 cm × 40 cm; and (c) with its side of dimensions 40 cm × 20 cm. The pressure exerted by the wooden block on the tabletop in these positions is represented by P_A, P_B and P_C respectively. The pressure follows the trend
    (a) $P_A > P_B > P_C$
    (b) $P_A < P_B < P_C$
    (c) $P_A = P_B = P_C$
    (d) $P_A < P_B = P_C$

63. Which one of the following metals can be extracted using carbon as reducing agent?
(a) Zinc (b) Silver
(c) Gold (d) Aluminum

64. Which among the following is NOT true with respect to colloidal solution?
(a) Particles are uniformly distributed throughout the solution
(b) Colloidal solution is homogenous in nature
(c) They show Tyndal effect
(d) They do not settle down when kept undisturbed

65. Kerosene and petrol mixture can be best separated by
(a) Sublimation
(b) Separating funnel
(c) Fractional distillation
(d) Compressing and cooling

66. As proposed by Dalton, which of the following symbol represents phosphorus?
(a) 

(b) 

(c) 
(d) 

67. Which among the following statements with respect to carbon is/are correct?
1. Carbon forms the basis for all living organisms and many things we use
2. Carbon shows tetra-valency and the property of catenation
3. Carbon forms covalent bonds with itself and other elements
4. Carbon forms compounds containing triple and tetra bonds between carbon atoms

Select the correct answer using the code given below:
(a) 1 only (b) 1 and 2 only
(c) 1, 2 and 3 (d) 2 and 4

68. Consider the following statements :
1. Terracotta models of the plough have been found at sites in Cholistan and at Banawali (Haryana).
2. There is evidence of a plowed field at Kalibangan associated with the mature phase of the Harappan civilization.
3. The plowed field at Kalibangan had two sets of furrows crossing at right angles to each other suggesting two different crops were grown together in it.

Which of the statements given above are correct?
(a) 1, 2 and 3 (b) 2 and 3 only
(c) 1 and 3 only (d) None of the above

69. Which of the following statements about the technological innovations during the Industrial Revolutions are correct?
1. Mule was the nickname for a machine invented in 1779, that allowed the spinning of strong and fine yarn.
2. Water Frame, invented in 1769 by Richard Arkwright, made it possible to weave pure cotton clothes.
3. Power loom, invented by Edmund Cartwright in 1787, could be used to weave any kind of materials.

Select the correct answer using the code given below :
(a) 1 and 2 only (b) 1, 2 and 3
(c) 2 and 3 only (d) 3 only

70. Who among the following is known as the architect of Indian planning?
(a) V.E.R.Y Rao
(b) Sukhamoy Chakravarty
(c) P. C. Mahalanobis
(d) John Mathai

71. Which one of the following Ashokan Minor Rock Edicts, contains the personal name of the king - Ashoka ?
(a) Maski (b) Bahapur
(c) Bairat (d) Sahasram

72. Arrange the following in correct chronological order
1. Charak Samhita
2. Bharata's Natyashastra
3. Sangam Literature
4. Ashtadhyayi

Select .the correct answer using the code given below:
(a) 1 - 3 - 4 - 2 (b) 2 - 4 - 1 - 3
(c) 4 - 3 - 1 - 2 (d) 3 - 1 - 2 - 4

73. Which one of the following is NOT an example of Fold Mountain?
(a) Mt. Fuji (b) Alps
(c) Andes (d) Rockies

74. Which one of the following is an organic soil?
(a) Aridisols (b) Histosols
(c) Oxisols (d) Vertisols

75. The North-south and East-west Road Corridors of India cross each other at which of the following cities?
(a) Bhopal (b) Itarsi
(c) Gwalior (d) Jhansi

76. Which one of the following climatic regions of the world have a typical characteristic of seasonal reversal of wind?
(a) British type Climate
(b) Mediterranean Climate
(c) China type Climate
(d) Monsoon Climate

77. Which one of the following statements is NOT correct?
(a) Bokaro steel plant is located in Damodar river basin

(b) Jamshedpur steel plant is located on the confluence of Damodar and Barakar
(c) Salem steel plant is located on the bank of Kaveri River
(d) Bhilai steel plant obtains water from Tandula reservoir

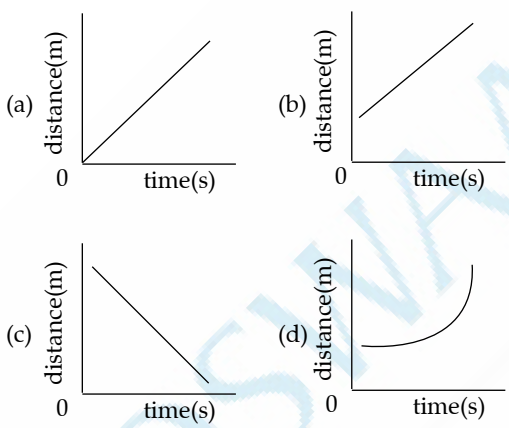
78. How many of the following pairs of specialized agriculture and its products are correctly matched?
1. Apiculture : Honey
2. Sericulture : Silk
3. Silviculture : Forestry
4. Viticulture : Grapes

Select the correct answer using the code given below:
(a) 4 (b) 3
(c) 2 (d) 1

79. Which one of the following crops is generally benefited by the rain caused by western disturbances in India?
(a) Rice (b) Wheat
(c) Bajra (d) Cotton

80. Which one of the following pairs of city and industry is NOT correctly matched?
(a) Saharanpur : Paper industry
(b) Chanderi : Cotton textile industry
(c) Bhadohi : Carpet industry
(d) Raniganj : Iron and steel industry

81. Which one of the following graphs represents the equation of motion $v = u + at$; where all quantities are non-zero and symbols carry their usual meanings?



82. Which one of the following statements is true for sound waves propagating in air?
(a) Sound is an electromagnetic wave and transverse in nature
(b) Sound is a mechanical wave and longitudinal in nature
(c) Sound is a mechanical wave and transverse in nature
(d) Sound is an electromagnetic wave and longitudinal in nature

83. A 100 g sphere is moving at a speed of 20 m/s and collides with another sphere of mass 50 g. If the second sphere was at rest prior to the collision and the first sphere comes at rest immediately after the collision, considering the collision to be elastic, the speed of the second sphere would be
(a) 10 m/s (b) 20 m/s
(c) 30 m/s (d) 40 m/s

84. Which one of the following optical phenomena supports that the light is a transverse wave?
(a) Refraction (b) Diffraction
(c) Interference (d) Polarization

85. How many of the following materials can be attracted by a magnet?
1. Plastic 2. Carbon
3. Aluminium 4. Stainless Steel

Select the correct answer using the code given below:
(a) 1 (b) 2
(c) 3 (d) None

86. Consider the following statements with reference to the Bhoodan Movement:
1. Vinoba Bhave organized 'The Sarvodaya Samaj' to take up the work of non-violent transformation in India
2. Jayaprakash Narayan withdrew from active politics to join the Bhoodan Movement in 1953
3. In the wake of the Bhoodan Movement the first donation of land was made in the village of Pochampalli in Telangana

How many of the statements given above is/are correct?
(a) 1 (b) 2
(c) 3 (d) None

87. Which among the following statements regarding the election of non permanent members to the United Nations Security Council is/are correct?
1. Five members corning from Africa and Asia, one from Eastern Europe, two from Latin America and two from Western Europe and other states
2. Six members are elected each year by the General Assembly for two year term

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

88. Which one of the following provisions of the Constitution of India deals with District Planning Committee?
(a) 243ZD (b) 243ZB
(c) 243ZE (d) 243ZC

89. Consider the following statements about Attorney-General in India:
1. She/he is the first law officer of the Government of India
2. She/he has a right to speak in any House of Parliament without any right to vote

3. She/he is appointed by the President of India
4. She/he is a whole-time counsel for the Government in the court of law

How many of the statements given above is/are correct?

(a) 1 (b) 2
(c) 3 (d) 4

90. Which one among the following states was NOT impacted by the Land Boundary Agreement Treaty between India and Bangladesh (2015) ?

(a) West Bengal (b) Assam
(c) Tripura (d) Arunachal Pradesh

91. The 480 MW Phukot Karnali Hydro Electric Project is situated in

(a) Thailand (b) Indonesia
(c) Nepal (d) Bhutan

92. Consider the following statements about a river: This river originates in the Hindu Kush mountain range and flows into Hamoun wetlands after covering a long stretch of about 1,100 km. There have been serious conflicts between two neighboring nations regarding the sharing of water from this river. Identify the river from the following:

(a) Mekong (b) Tarim
(c) Indus (d) Helmand

93. Match List I with List II and select the correct answer using the code given below the Lists:

List I (Bilateral Exercise)	**List II (Participating Country)**
A. Garuda Shakti	1. India and Japan
B. Nomadic Elephant	2. India and Sri Lanka
C. Mitra Shakti	3. India and Mongolia
D. Dharma Guardian	4. India and Indonesia

Code:

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

94. Consider the following statements about gallantry awards in India:

1. Post-independence, first three gallantry awards were instituted on 26th January, 1950
2. The first three gallantry awards were Ashoka Chakra Class-I, Ashoka Chakra Class-II and Ashoka Chakra Class-III

Which of the statements given above is/are correct?

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

95. Consider the following statement about Centralized Laboratory Network (CLN):

1. CLN works to test vaccines which can be used during pandemic
2. India is a member of CLN
3. CLN is a part of the Coalition for Epidemic Preparedness Innovations (CEPI)

Which of the statements given above is/are correct?

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

96. Consider the following statements about Kavach, the automatic train protection system:

1. It is designed and developed by Research Design and Standard Organisation (RDSO) in collaboration with Railway Technical Research Institute (RTRI), Japan
2. The trials of Kavach were facilitated by the Southern Railway
3. Kavach is a state-of-the-art electronic system with Safety Integrity Level-4 (SIL-4)

Which of the statements given above is/are correct?

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

97. The Nova Kakhovka dam, which was in news recently, is situated in

(a) Belarus (b) Turkey
(c) Ukraine (d) Poland

98. Aaron Finch, who recently retired from international cricket, was captain of the men's cricket team of which one of the following countries?

(a) South Africa (b) Australia
(c) England (d) New Zealand

99. Which one of the following is the name of the dashboard launched recently by the Reserve Bank of India to assess and monitor the progress of financial inclusion by capturing relevant parameters?

(a) Pragya (b) Antardrishti
(c) Divyachakshu (d) Antargyan

100. 'Sengol', installed in the new Parliament building of India, was seen as a symbol of the path of service, duty and nation in which Empire of the past?

(a) Gupta Empire (b) Shunga Empire
(c) Pandyan Empire (d) Chola Empire

Answers			
Q No	**Answer Key**	**Topic Name**	**Chapter Name**
1	(b)	Scattering of Light	Light
2	(b)	Speed of Light	Light
3	(a)	Power	Electric Current
4	(c)	Heating Effect of Current	Electric Current
5	(c)	Plane Mirror	Ray Optics
6	(c)	Methods to Protect Comoi	Metal and Non Metal
7	(d)	Alloys	Metal and Non Metal
8	(c)	Allopope	Organic Compound
9	(c)	V I Characteristics	Semiconductors
10	(a)	Photosynthesis	Photosynthesis in Plants
11	(b)	Types of Chemical Reaction	Chemical Reaction
12	(c)	Types of Chemical Reaction	Chemical Reaction
13	(d)	Physical and Chemical Change	Chemical Reaction
14	(b)	Reactivity Series	Metal and Non Metal
15	(d)	Physical State	Chemical Reaction
16	(b)	Sexual Reproduction	Reproduction in Organisms
17	(d)	Cell and its Organelles	Cell and its Organelles
18	(a)	Microphone	Human Health and Diseases
19	(d)	Male Reproductive Cell	Reproduction in Plants
20	(b)	Genetic Variation	Reproduction in Organisms
21	(b)	Pollination	Reproduction in Organisms
22	(c)	Ancient Indian History	The Ancient Indian King and their High Status
23	(a)	Medieval Indian History	Bhakti Movement
24	(c)	The French Revolution	Reign of Terror
25	(c)	The First World War	Nationalism in India
26	(b)	Modern Indian History	The Quit India Movement
27	(d)	Ore and Minirals	Metal and Non Metal
28	(b)	Pressure	Fluid Mechanics
29	(a)	Geological History	Precambrian Era
30	(c)	Latitude, Longitude and Time	Geographical Grid
31	(b)	Earth's Atmosphere	Troposphere Layer
32	(d)	Lakes and Rivers	Lakes and Rivers
33	(a)	Speed	Kinematics
34	(a)	Generator	Electromagnetic Induction
35	(b)	Power of Lens	Optics
36	(b)	Resistance	Electric Current
37	(a)	Bioling Point	Solution
38	(a)	Organic Compound	Carbon and its Compound

39	(b)	Unra of Acid	Acid, Base and Salt
40	(a)	Litmus Test	Acid, Base and Salt
41	(d)	Alloys	Metals and Non-Matals
42	(c)	Techniques of Sepration	Organic Compound
43	(d)	Photosynthesis	Photosynthesis in Plants
44	(d)	Pollern Grains	Reproduction in Plants
45	(a)	Reproduction in Plants	Reproduction in Plants
46	(d)	Reproduction in Flowering Plants	Reproduction in Plants
47	(c)	Defence	Paramilitary Force Related Books
48	(c)	Indian Art and Culture	Cultural Developments of India- Stupas and Sculptures
49	(c)	Five Year Plan	Planning in India
50	(d)	History of Medieval India	Important Poets Related to Bengali Language
51	(c)	An Imperial Capital: Vijayanagara	The Vijayanagara Empire
52	(a)	Population of India and Different States	Population of India and Different States
53	(a)	Classification of Soils	Classification of Soils- Regur Soil
54	(a)	What, Where and How	Central Institute of Buddhist Studies
55	(a)	Physical Feature of India	Physical Feature of India
56	(c)	Physical Feature of India	Mountain Ranges of India- Shivalik Foothills
57	(b)	International Water ways	Important Waterway -The Suez Canal
58	(b)	Density of water	Density of Water
59	(a)	Combination of Resistors	Electric Current
60	(d)	Force on Charge in Magnetic Field	Moving Charge and Magnetism
61	(d)	Newton's Second Law	Newton's Law of Motion
62	(a)	Pressure	Fluid
63	(a)	Reactivity Series	Metal and Non Metals
64	(b)	Colloidal Solution	Surface Chemistry
65	(c)	Fractional Distillation	Refining
66	(d)	Symbols of Atoms	Basic Concept of Chemistry
67	(c)	Science and Technology	Carbon Dating System
68	(a)	Ancient Indian History	The Indus Valley Civilisation
69	(a)	World History- 19th Century Europe	The Industrial Revolution in Britain
70	(c)	Indian Economy-Five Year Plan	Five year Plan- P.C. Mahalanobis
71	(a)	Maurya Dynasty	Important Inscription Rock Edicts Related to the King Ashoka
72	(c)	Ancient Indian History	Some Ancient History Book and their Author Names
73	(a)	Earth's Crust- Types of Mountains	Fold Mountains
74	(b)	pH of Soil	Organic Chemistry
75	(d)	Some Important Corridors in India for Tansportation	North-South and East-West Road Corridors of India
76	(d)	Climate Region of the World	Monsoon

77	(b)	Steel Plant and their Location	Steel Plant and their Location
78	(a)	Agriculture	Different Branch of Agriculture for Specialization
79	(b)	Indian Climate	Monsoon Rain- Western Disturbance
80	(d)	Iron and Steel Industry of India	Iron and Steel Industry of India with their Location in the Map
81	(d)	Graph	Kinematics
82	(b)	Types of Wave	Sound Wave
83	(d)	Linear Mometum	Work, Energy & Power
84	(d)	Polarisation	Light
85	(d)	Magnetic Material	Magnetism
86	(c)	After Independence- Some Movement	The Bhoodan Movement
87	(a)	International Organisation-The United Nations	The United Nations -Security Council
88	(a)	Indian Constitution	Indian Constitution Part-IX Municipal Cooperation
89	(c)	Indian Constitution	Indian Constitution Part-V the Attorney General of India
90	(d)	India and its Neighbor Country Relations	Land Boundary Agreement Treaty – 2015
91	(c)	India and its Neighbor Country Relations	Hydroelectric Project in Nepal
92	(d)	World Important Rivers	Asia continent - Hindu Kush Mountain Range River System
93	(b)	India Bilateral Exercise	List of Bilateral Exercise India with Some Countries
94	(a)	Government of India-Awards	List of Gallantry Awards
95	(d)	Centralized Laboratory Network	India and other Members of this Network
96	(b)	Science and Technology	Automatic Train Protection (ATP) System.
97	(c)	World Important Dams Name Lists	The Nova Kakhovka Dam
98	(b)	Sports	International Cricket
99	(b)	Economy-Indian Monetry System	Role of Reserve Bank of India
100	(d)	South -India Empire	Chola Dynasty

NDA / NA
National Defence Academy / Naval Academy

GENERAL ABILITY TEST

II

SOLVED PAPER

2023

ANSWERS WITH EXPLANATION

1. Option (b) is correct.
Explanation:
The dust particle on the path of light is visible because of scattering of light.

2. Option (b) is correct.
Explanation:
Speed of sound in air = 340 m/s
Speed of light in air = 3×10^8 m/s
Thus the lightening is seen first and then the sound is heard.

3. Option (a) is correct.
Explanation:
P = VI
$= 220\ V \times 0.5\ A = 110\ W$
Now,
$\Rightarrow \quad 110 = 120 \times I$
$\Rightarrow \quad I = \frac{110}{120} = 0.9\ A \approx 1A$

4. Option (c) is correct.
Explanation:
The heating element in an electric iron is usually made up of Nichrome. Nichrome is an alloy which is made up of 80% of Nickel and 20% Chromium.

5. Option (c) is correct.
Explanation:
In order to see the full image, the size of mirror required is just half of the height of object.
Therefore the minimum height of the plane mirror required is $h = \frac{1.5}{2} = 0.75$ m

6. Option (c) is correct.
Explanation:
During Galvanization more reactive metal like zinc is coated on the surfaced iron. So this more reactive metal undergoes corrosion in comparison to iron.

7. Option (d) is correct.
Explanation:
Steel contain carbon non-metal.
Steel = Fe = 72 %, Cr = 17-19%, Ni = 7-9 % with carbon.
Brass = Cu = 66%, Zn = 34%
Bronze = Cu = 88%, Sn = 12%
Amalgam = Ag = 67 – 74%, Sn = 25 – 28%, Cu = 6%, Zn = 2%, Hg = 3%.

8. Option (c) is correct.
Explanation:
Allotropy is the property of element due to which element exist is different form but have same chemical properties and different physical properties. Carbon has three allotrops Graphite, Diamond and Fullerene.

9. Option (c) is correct.
Explanation:
The current flowing through the semiconductor is not linearly proportional to the voltage. In forward bias the current increases by increasing the voltage in parabolic way.

10. Option (a) is correct.
Explanation:
Green plants utilize approximately 1% of the solar radiation they absorb through their leaves for the process of photosynthesis. This critical reaction relies on the absorption of sunlight. Carbon dioxide is taken in by the plant through stomata, commonly found on the underside of the leaves, while water is absorbed through its roots. The fraction of solar radiation utilized for photosynthesis is approximately 1%.

11. Option (b) is correct.
Explanation:
$Fe_2O_3(s) + 2Al(S) \rightarrow 2Fe(s) + Al_2(O_3)$, ΔH = –ve
- This reaction is highly exothermic reaction .
- Aluminium displace Fe, so in an example of displacement reaction.
- Fe_2O_3 undergoes reduction, so it acts an Oxidizing Agent.
- Due to Highly exothermic nature it is applicable to joining of railways tracks.

12. Option (c) is correct.
Explanation:
Burning of coal
$C + O_2 \rightarrow CO_2$ Combination reaction
$B \rightarrow 2$
Electrolysis of water
$$H_2O \xrightarrow{Electrolysis} H_2(g) + \frac{1}{2}O_2(g)$$
Decomposition reaction

$A \rightarrow 3$

Iron nail Immersed in Copper Sulphate Solution

$Fe + CuSO_4(al) \rightarrow FeSO_4(al) + Cu(s)$

Displacement reaction

$C \rightarrow 4$

$3BaCl_2(al) + Al_2SO_4 \rightarrow 3BaSO_4(al) + 2AlCl_3$

Double displacement reaction

$D \rightarrow 1$

$A \rightarrow 3, B \rightarrow 2, C \rightarrow 4, D \rightarrow 1$

13. Option (d) is correct.

Explanation:

Chemical reaction represents chemical change taking place during reaction

Burning of Magnesium Ribbon

$$Mg + \frac{1}{2}O_2 \rightarrow MgO$$

Evaporation of petrol, dissolution of salt in water storing of oxygen gas under pressure in a gas cylinder represents physical changes.

14. Option (b) is correct.

Explanation:

Iron does not react with cold water to produce H_2. However it reacts with hot water to produce H_2. Ca, K, Na being strong reducing agents reacts with water to produce H_2.

15. Option (d) is correct.

Explanation:

$2HgO(s) \xrightarrow{\Delta} 2Hg(l) + O_2(g)$

$HgO \rightarrow$ Solid State

$Hg \rightarrow$ Liquid State

$O_2 \rightarrow$ Gas State

16. Option (b) is the correct.

Explanation:

Meiosis contributes to genetic diversity by rearranging and recombining genetic material within an organism, while fertilization combines genetic material from two separate parents. These fundamental biological processes, along with the potential occurrence of mutations, collectively generate the genetic variation observed in sexually reproducing organisms. This genetic diversity plays a vital role in enabling organisms to adapt to shifting environments and drive the evolutionary processes that occur over extended periods.

17. Option (d) is the correct.

Explanation:

Mitochondria are exclusive to eukaryotic cells, just like other membrane-bound structures such as the nucleus and the Golgi apparatus (which will be discussed further later on). One prevalent theory explaining the evolution of eukaryotic cells suggests that mitochondria may have originally been independent prokaryotic cells that established a symbiotic relationship by residing within other cells.

18. Option (a) is the correct.

Explanation:

Streptococcus mutans, the bacterium responsible for tooth decay, forms a slimy layer primarily from dietary sugars, especially sucrose. This sticky biofilm adheres to teeth, providing a breeding ground for harmful bacteria. As these bacteria metabolize sugar, they produce acids that erode tooth enamel, leading to cavities. Managing sugar intake and maintaining good oral hygiene are crucial in preventing this dental issue.

19. Option (d) is the correct.

Explanation:

In the process of plant reproduction, one of the male gametes combines with the female gamete, giving rise to the formation of an embryo. This embryo then undergoes further development, ultimately maturing into a new plant. Simultaneously, another male gamete fuses with polar nuclei, eventually leading to the formation of endosperm. The endosperm plays a vital role in nourishing the developing embryo by providing it with essential nutrients and sustenance.

20. Option (b) is the correct.

Explanation:

In the context of sexual reproduction in organisms, the statement suitable for both parent and offspring is: "Both the parent and the offspring maintain a consistent chromosome number and DNA content." This statement accurately portrays the essence of sexual reproduction, where both parent and offspring possess an unchanging chromosome number and DNA content as they inherit complete sets of chromosomes from each parent, preserving the species' genetic stability.

21. Option (b) is the correct.

Explanation:

Bees and flowering plants engage in a mutualistic relationship that proves advantageous to both species. Within this symbiotic partnership, flowers offer bees a source of nectar and pollen, which diligent worker bees collect to sustain their entire colonies. In return, bees play a vital role for flowers in their reproductive process by facilitating the transfer of pollen from one flower to another, a crucial step known as pollination. This mutual dependency ensures the continued survival and propagation of both bees and flowering plants.

22. Option (c) is correct.

Explanation:

Many kings have ruled in ancient India. Most of the kings wanted to make their kingdom more powerful. The king would become an all-powerful monarch in the Ancient Society and attempt to claim a higher status. So they adopted the following methods:-

- They made ample use of the booming long distance trade to higher their status.
- The ancient Indian king adopted a grandiose title.
- They were appointed poets and others to write Prashastis about them.
- Kings sought to expand their territories through military conquests.
- Optimizing taxes or reducing them in special circumstances in order to increase popularity among people and show kindness to the king.

23. Option (a) is correct.

Explanation:

Bhakti Movement

- It was a religious movement in medieval Hinduism that sought to bring religious reforms to all strata of society.
- In the 14th and 15th centuries, Ramananda, Kabir and Nanak remained great apostles of the Bhakti cult.
- It promoted diversity of religious ideas in religion.
- The Alvars were Tamil poet-saints of South India who espoused bhakti (devotion) to the Hindu Supreme god Vishnu or his avatar Krishna in their songs of longing, ecstasy and service.
- The Nayanars were a group of 63 saints (also saint poets) in the 6th to 8th century who were devoted to the Hindu god Shiva in Tamil Nadu.
- The Bhakti movement in north India developed around the worship of Rama and Krishna.
- The bhakti movement relied on the devotion of god, with and without attributes.
- Tulsidas was a devotee of Lord Rama while saint Kabir followed the path of devotion without attributes and emphasized the unity of all religions.

24. Option (c) is correct.

Explanation:

The "Reign of Terror" in revolutionary France referred to trial and beheading persons considered enemies of the republic by the revolutionary tribunal from 1793 to 1794 CE. Approximately 17000 people were arrested, imprisoned and then killed in the Reign of Terror during this period.

25. Option (c) is correct.

Explanation: The First World War took place from 28th July 1914 to 11th November 1918 in which Army, Navy and Air forces of about 30 countries participated. The international conflict principally between Central Powers (mainly Germany, Austria-Hungary, and Turkey) against the Allies (mainly France, Great Britain, Russia, Italy, Japan resulted in the deaths of millions of soldiers and massacres around the world. Europe was badly affected by this war.

- The European economy had collapsed and it transformed from world's largest creditors to the world's debtors.
- National honor occupied center stage in the public sphere in Europe after First World War.
- Popular support for conservative dictatorships in Europe increased after the First World War because people demanded self-protection and security.
- Soldiers come to be placed higher in social status than civilians. They are regarded as "Heroes of the War".

26. Option (b) is correct.

Explanation:

The Quit India Movement was known as the Bharat Chhodo Andolan because it passed a resolution calling for an immediate end to British rule in India. Under the leadership of M.G. Gandhi Quit India Resolution was passed on 8th August 1942 in Bombay by the working committee of Indian National Congress with the mantra 'Do or Die'.

27. Option (d) is correct.

Explanation:

Kudremukh is famous for iron ore

Mine – Ore
Bailadila – Iron
Zawar – Zinc
Ghatsila – Copper
Kudremukh – Iron ore

28. Option (b) is correct.

Explanation:

$$P = \frac{F}{A}$$

Unit of pressure = $\frac{N}{m^2}$ or Pa, bar

1 bar = 10^5 Pa

1 milibar = $\frac{10^5}{10^3}$ Pa = 100 Pa

29. Option (a) is correct.

Explanation:

The Precambrian era is one of the oldest eras of geological history determining the age of various rock types. Symbolically the Precambrian Era can be presented as PC, X, Y, or Z in the GRI GIS data.

30. Option (c) is correct.

Explanation:

A geographical grid is used to determine position on the earth's surface through latitude and longitude lines. The equator divides the Earth into two hemispheres. A geographical grid has 180 lines that run east to west around the globe to mark latitude. The imaginary lines that run north to south from North Pole to South Pole indicated longitude are known as meridians of longitude, or simply meridians. Thus, it is concluded that both 1 and 2 statements are true regarding geographical grid.

31. Option (b) is correct.
Explanation:
All weather and related phenomena occur in the Troposphere layer of the atmosphere such as formation of clouds. Some important fact regarding Troposphere is following:-
- It is the lowest layer of the atmosphere
- The temperature in this layer generally decreases with height.
- It is 10 miles away from the equator.
- Convection, turbulence, and clouds occur in the Troposphere.

32. Option (d) is correct.
Explanation:
Roopkund Lake is located in Chamoli district of Uttarakhand, India. It is situated approximately 16,500 feet above sea level. Roopkund Lake is also known as Skeleton Lake.

33. Option (a) is correct.
Explanation:

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Total time}}$$

$$= \frac{2400 - 2000}{8}$$

$$= \frac{400}{8} = 50 \text{ km/h}$$

34. Option (a) is correct.
Explanation:
In AC generator slip ring is used as to change the direction of current and DC generator split ring is used to allow the current to flow in a fixed direction.

35. Option (b) is correct.
Explanation:
The defect is known as nearsightedness or myopia and can be correct by using concave lens.

$$P = \frac{1}{f} = \frac{1}{-2} = -0.5 \text{ D}$$

36. Option (b) is correct.
Explanation:

$$R = \rho\frac{l}{A}$$

ρ = resistivity, depends upon temperature and nature of material.

$$\rho = \rho_0(1 + \alpha\,\Delta T)$$

So

$$R = R_0(1 + \alpha\,\Delta T)$$

37. Option (a) is correct.
Explanation:
At boiling point vapour pressure become equal to atmospheric pressure.

38. Option (a) is correct.
Explanation:
Organic compound is defined as compound of Carbon Hydrogen and their derivative.
NH_4CNO – Inorganic Compound
Massh Gas, Urea, Cane Sugar – Organic Compound.

39. Option (b) is correct.
Explanation:
HNO_3 is used for cleaning of Gold and Silver Ornaments.

40. Option (a) is correct.
Explanation:
Ethanol is weak acid so it does not converts blue litmus to red, which indicate weak acidic nature of ethanol.
So, ethanol is neutral towards litmus.

41. Option (d) is correct.
Explanation:
Steel does not contain Sn.
Steel = Fe = 72%, Cr = 17-19%, Ni = 7-9%, with carbon.

42. Option (c) is correct.
Explanation:

Separation of acetone and water from their mixture	–	Distillation technique
Separation of water and kerosene oil from their mixture	–	Separating funnel
Separation of cream from milk	–	Centrifugation
Separation of Pigment from plant extract	–	Chromatography

$A \to 3, B \to 4, C \to 2, D \to 1$

43. Option (d) is the correct.
Explanation:
Photosynthesis requires light, carbon dioxide, water, and pigments like chlorophyll. Oxygen is produced as a byproduct but not needed for the process itself.

44. Option (d) is the correct.
Explanation:
The pollen grain is a product of the meiotic division and carries only half the chromosome number and DNA content compared to its microspore mother cell. During meiosis, the microspore mother cell undergoes two successive divisions, reducing its chromosome count by half, resulting in the formation of haploid microspores. These microspores then develop into pollen grains, each harboring a single set of chromosomes and a reduced amount of genetic material. This

genetic reduction ensures that when pollen grains unite with the female ovule, the resulting zygote possesses the correct diploid chromosome number, thus maintaining the stability of the species' genetic makeup during sexual reproduction.

45. Option (a) is the correct.

Explanation:

In the process of sexual reproduction in angiosperms (flowering plants), the sequence unfolds as follows:

Egg: Within the female reproductive structure of a flower, the ovule contains the egg cell.

Zygote: Fertilization takes place when a pollen grain (male gamete) merges with the egg cell (female gamete), forming a zygote. This zygote is diploid, as it inherits a complete set of chromosomes from both parent plants.

Embryo: Subsequent to fertilization, the zygote undergoes multiple rounds of cell division and differentiation, eventually developing into an embryo inside the ovule. This stage marks the early growth of the future plant.

Seed: As the embryo matures, it becomes enveloped by the ovule, which matures into a seed. This seed comprises the developing plant embryo, stored nutrients, and a protective seed coat.

This sequence represents the natural progression of sexual reproduction in angiosperms, encompassing the stages from egg formation to seed development.

46. Option (d) is the correct.

Explanation:

In the reproductive cycle of flowering plants (angiosperms), the sequence unfolds as follows:

Egg to Zygote: Fertilization takes place when a pollen grain, carrying male gametes, combines with the egg cell within the female reproductive structure of the flower, resulting in the formation of a diploid zygote.

Zygote to Embryo: Subsequent to fertilization, the zygote undergoes multiple rounds of cell division and differentiation, eventually giving rise to an embryo.

Ovule to Seed: As the embryo matures, the ovule in which it resides also matures into a seed. The seed encompasses the developing plant embryo, along with stored nutrients and a protective seed coat.

Ovary to Fruit: Following fertilization, the ovary of the flower undergoes transformation into a fruit. The fruit serves various purposes, including safeguarding and promoting the dispersal of seeds, often attracting seed-dispersing animals.

This sequence illustrates the natural progression of sexual reproduction in angiosperms, commencing with egg formation and culminating in fruit development.

47. Option (c) is correct.

Explanation:

The book **'Nation First – The Golden Saga of 82 Years'** is the history of the CRPF paramilitary force. This book was released by The Union Home Minister, Amit Shah on 19th February 2021. In this book, the glorious history, establishment, journey, challenges, successes, and sacrifices of the Central Security force has been publicized in sequence.

48. Option (c) is correct.

Explanation:

Both the statements are true regarding Sanchi Stupa. Some important facts are given below.

- Sanchi Stupa was "discovered" in 1818 by General Taylor.
- When it was discovered, three of its four gateways were still standing, the fourth was lying on the spot.
- Where it had fallen and the mound was in good condition.
- These gateways were named as northern, southern, eastern and western Gateways by its discoverer.

49. Option (c) is correct.

Explanation:

After independence, the Government of India adopted the path of planning for growth and development of the nation. The first five year planning was started on 9 July 1951 with the aim of the development of the agriculture sector. The second five year plan was introduced in April 1956 to accelerate the GDP growth through "rapid Industrialisation". Since 1951, a total of 12 five year plans have been successfully completed with different objectives and results. Planning commission was replaced with NITI Aayog in 2014.

50. Option (d) is correct.

Explanation:

Mukundarama Chakravarti composed the Chandimangala epic in the late 16th century. He was originally a Bengali poet who became very popular after writing the epic poem Chandimangal. The Chandimangala/Mangalkavya, considered one of the most prominent works of the 16th century which is a sub-genre of medieval Bengali literature.

51. Option (c) is correct.

Explanation:

The Vijayanagara Empire (1336–1646)

- The Vijayanagara Empire was a powerful empire in medieval India.
- This kingdom existed from 1336 to 1646 in the region around present-day Karnataka state.
- The kings of this empire ruled this region for 310 years.
- It was founded by two brothers named Harihara and Bukka Raya.

- Vijayanagar Empire was ruled by four important dynasties – Sangama,Saluva, Tuluva, Aravidu.
- The royal Centre was located in the south-western part of the settlement in the Vijayanagara Empire.
- Religion had enough respect in the empire. So about 60 temples were located in this empire and near about 30 building complexes have been identified as palaces.

52. Option (a) is correct.

Explanation:

Area wise Madhya Pradesh is the second largest state in India.

S. No.	State	Area (sq. km)
1.	Rajasthan	342,239
2.	**Madhya Pradesh**	**308,245**
3.	Maharashtra	307,713
4.	Uttar Pradesh	240,928

53. Option (a) is correct.

Explanation:

Regur Soil is ideal for growing cotton.

Features of Regur Soil

- Regur soil is also known as Black soil and black cotton soil.
- Normally Regur soil contains pH between 5.8 to 8.0.
- Black soil has high clay content and a good capacity to retain water.
- Cultivation of cotton requires high moisture retention.
- Black soils are very fine grained and dark, contain a high proportion of calcium and magnesium carbonates

54. Option (a) is correct.

Explanation:

The Central Institute of Buddhist Studies is located in Leh town of Ladakh. It is a Deemed university under the Ministry of Culture established in 1959. Previously it was known as the "School of Buddhist Philosophy". This institute was funded and approved by the Ministry of culture in 1962 and it was registered as an educational institute in the year 1964 under Jammu and Kashmir.

55. Option (a) is correct.

Explanation:

Only statement (1) is true regarding physical features of India. Physical features refer to the natural structure or the landforms of India. Some important facts regarding the physical features of India are following:

- The physical features of India include - Himalayan Mountains, Northern plains, Indian Desert, Peninsular plateau & Coastal Plains.
- The Peninsular Plateau is one of the oldest landforms of earth.
- The Southern point of the plateau is formed by the Nilgiri Hills where the Eastern and the Western Ghats meet.
- A part of land is covered in three sides of water and one side with land called peninsular.
- The Cardamom Hills lying beyond may be regarded as a continuation of the Western Ghats.
- The eastern coastal plains come in between the Eastern Ghats and the Bay of Bengal.

56. Option (c) is correct.

Explanation:

Bhabar is a narrow belt stretching about 10 km, almost parallel to the Shivalik foothills at the break-up of the slope. As a result of this, streams and rivers flowing out of mountain ranges deposit heavy material of large rock rocks and boulders and at times, disappear in this zone.

57. Option (b) is correct.

Explanation:

The Suez Canal is an important waterway in Egypt which provides an important sea-level trade route between Europe and Asia. Some of important fact related to Suez Canal is following:-

- It is an artificial sea-level waterway or manmade navigation canal.
- It links the Mediterranean Sea and the Red Sea.
- The economic significance of the Suez Canal is more than that of the Panama Canal because it provides the shortest route from London to Shanghai and Rotterdam to Mumbai.

58. Option (b) is correct.

Explanation:

An iron nail sinks in water because the average density of the nail is higher than that of the water displaced by the nail. Whereas the density of a water ship is less than the water displaced by it, hence it floats.

59. Option (a) is correct.

Explanation:

(a) $\frac{1}{R_e} = \frac{1}{3}+\frac{1}{3}+\frac{1}{3} = \frac{3}{3} = 1$

$R_e = 1\ \Omega$

(b) $R_e = \frac{3\times 3}{3+3} = \frac{9}{6} = \frac{3}{2} = 1.5\ \Omega$

(c) $R_e = 1 + 1 = 2\ \Omega$

(d) $R_e = 1 + 1 + 1 = 3\ \Omega$

60. Option (d) is correct.

Explanation:

Force acting a charged particle moving in uniform magnetic field is given by

$\vec{F} = q\vec{v}\times B$ $(q \Rightarrow +\text{ve})$

$\vec{F} = -q\vec{v}\times B$ $(q \Rightarrow -\text{ve})$

Therefore both charges experience fore in opposite direction. And both will move in a circular track.

61. Option (d) is correct.

Explanation:

Comparing the given equation with equation of motion.

$$y = ut - \frac{1}{2}gt^2 \quad \text{(i)}$$

$$s = ut + \frac{1}{2}at^2 \quad \text{(ii)}$$

Therefore, acceleration = $-g$

F = ma

= $-mg$

62. Option (a) is correct.

Explanation:

Let the weight is w Newton.

(a) $P_A = \frac{w}{A} = \frac{w}{20 \times 10} = \frac{w}{200}\frac{N}{cm^2}$

(b) $P_B = \frac{w}{A} = \frac{w}{20 \times 40} = \frac{w}{400}\frac{N}{cm^2}$

(c) $P_C = \frac{w}{40 \times 20} = \frac{w}{800}\frac{N}{cm^2}$

Thence, $P_A > P_B > P_C$

63. Option (a) is correct.

Explanation:

Metal which are present in the middle of reactivity series can be reduced with the help of carbon.

e.g., Fe, Zn and Pb

64. Option (b) is correct.

Explanation:

Colloideal solution are heterogeneous in nature. They shown tyndal effect. They do not settle down under the effect of gravity. Colloidal solution contain particle which are uniformaly distrubuted.

65. Option (c) is correct.

Explanation:

Kerosene and petrol mixture is separated by fractional distillation as kerosene and petrol has different boiling point.

66. Option (d) is correct.

Explanation:

Dalton gives symbol for phosphorus.

67. Option (c) is correct.

Explanation:

Carbon is present in living organisms. Carbon shows tetravalency and property of catenation and carbon forms covalent bonds with itself and other atoms. Carbon does not form tetra bond.

68. Option (a) is correct.

Explanation:

The Indus Valley Civilisation (3300-1300 BCE)

- Indus Valley Civilisation was a Bronze Age civilization.
- It is famous for its great cities like Harappa, Ganeriwala, Dholavira, Kalibangan, Rakhigarhi and Mohenjo-daro.
- Archaeologists have confirmed the facts related to this civilization on the basis of the remains excavated here.
- Terracotta models made of plough have been found at many sites in Cholistan and at Banawali (Haryana).
- Evidence of a plowed field has been found at Kalibangan (Rajasthan) which is associated with the early Harappan Civilisation.
- Historians have found plow marks in the fields of Kalibangan. These were two sets of lines drawn by the plough, intersecting each other at right angles, which shows that two different crops were grown simultaneously in them.

69. Option (a) is correct.

Explanation:

The Industrial Revolution began in Great Britain in the mid-18th century. Many technical and technological innovations emerged in this revolution. Some important things related to this revolution are as follows–

- A Machine invented in 1779 by Samuel Crompton which is popularly known as "spinning mule". The thread spun from this was very strong and fine yarn.
- Weaving of pure cotton clothes became possible with the water frame invented by Richard Arkwright in 1769.
- The Power Loom was invented by Edmund Cartwright in 1784 and the first power loom was designed and patented in 1785.
- It was an automatic device designed to automate the weaving process.

70. Option (c) is correct.

Explanation:

P.C. Mahalanobis was a great scientist and statistician who laid the foundation of planned development strategy in India. Mahalanobis was also known as the architect of planning in India. Prasanta Chandra Mahalanobis has established the following organization/institution in India.

- The Indian Statistical Institute in Calcutta – 1931
- The Indian Econometric Society
- National Sample Survey Office - 1950
- Documentation Research And Training Centre – 1962

71. Option (a) is correct.

Explanation:

Devanam Priyadasi was the personal name of King Asoka. Maski inscriptions rock edicts personal name of King Asoka at Raichur doab in Karnataka. Emperor Ashoka was a powerful King of the Indian Maurya Dynasty who was a follower of Buddhism. Ashoka ruled from 269 to 232 BC. He

tried to convey his message to the people through inscriptions.

72. Option (c) is correct.
Explanation: – 4 – 3 – 1 - 2

chronological Order	Book	Written by	Year
1	Charak Samhita	Maharshi Charak	1st century ce.
2	Bharat's Natyashastra	Bharata Muni	500 BCE
3	Sangam Literature	Tholkappiyar	Between 4th and 5th century CE.
4	Ashtadhyayi	Panini	*During the 6th to 5th century BCE.*

73. Option (a) is correct.
Explanation:
Fold Mountains are referred to the mountains which formed from the folding of the earth's crust when two or more tectonic plates collide with one another. Mount Fuji is not a fold mountain, it is a huge mountain in Japan Few examples of Fold Mounts are -

- The Alps Mountains in Europe
- The Andes in South America
- The Rockies Mountains in North America.
- The Himalayan Mountains in Asia.

74. Option (b) is correct.
Explanation:
Histosols contain large amounts of organic matter. They are composed of organic matter. They contain 20-30% organic matter.

75. Option (d) is correct.
Explanation:
Jhansi is a historic city of Uttar Pradesh where the North-South and East-West road corridors of India cross each other. Jhansi is the junction of the largest ongoing highway project in India that covers 7300 kilometers between Srinagar, Kanyakumari, Kochi, Porbandar and Silchar.

76. Option (d) is correct.
Explanation:
Monsoon is the climate region of the world that has a typical characteristic of seasonal reversal of wind, especially in the Indian subcontinent, Myanmar, Thailand, Laos and Cambodia.

77. Option (b) is correct.
Explanation:
Statement (b) is incorrect regarding Jamshedpur Steel Plant.

Steel Plant	Estd. Year	State	Geographical Location
Bokaro steel plant	1964	Jharkhand	Located on the southern bank of River Damodar
Jamshedpur steel plant	1907	Jharkhand	located near the confluence of the rivers Subarnarekha and Kharkai
Salem steel plant	1981	Tamil Nadu	Located on the bank of Cauvery (Kavari) River
Bhilai Steel Plant	1955	Chhattisgarh.	It is not located on a river side, Water is supplied from Tandula Canal.

78. Option (a) is correct.
Explanation:

Branch of Agriculture	Product/Outcome
Apiculture	Beekeeping and Honey Production
Sericulture	Process of cultivating silkworms and extracting silk from them.
Silviculture	Forest, Tree and timber
Viticulture	harvesting of grapes

79. Option (b) is correct.
Explanation:
Western Disturbance is an extratropical storm. This storm is responsible for winter rainfall in the northwestern part of the Indian subcontinent. Rains in this season have benefited rabi crops – mainly wheat.

80. Option (d) is correct.
Explanation:
Raniganj is not famous for the Iron and steel industry.

City	State	Industry
(a) Saharanpur	Uttar Pradesh	The city of Saharanpur is known for the Paper Industry.
(b) Chanderi	Madhya Pradesh	This city is famous for Sarees, Wooden work, Bidi industry & Diamond industry
(c) Bhadohi	Uttar Pradesh	Bhadohi is one of largest centers of Carpet Industries in India and is worldwide known as 'Carpet City of India'.
(d) Raniganj	West Bengal	It is famous for the most reliable quality of cooking coal

81. Option (d) is correct.

Explanation:

The slope of displacement time graph gives velocity. If slope changes then velocity changes.

In graph a, b and c the slope is constant and hence the velocity is constant. Therefore acceleration is zero. In graph (d) the acceleration has non zero value.

82. Option (b) is correct.

Explanation:

Sound is a mechanical wave it means it require medium to propagate. Sound waves are longitudinal in nature as the motion of particle is along the same direction of wave.

83. Option (d) is correct.

Explanation:

Applying conservation of linear momentum

$50 \times v = 100 \times 20$

$\Rightarrow v = 40$ m/s

84. Option (d) is correct.

Explanation:

The phenomena of polarization gives the idea that the the electric field and magnetic field oscillates perpendicular to the direction of propagation of light.

85. Option (d) is correct.

Explanation:

Plastic, carbon and aluminium is non-magnetic material. Stainless steel is an alloy made up of Iron which get attracted by magnet.

86. Option (c) is correct

Explanation:

The Bhoodan movement was a non-violent movement which started from Pochampally village (Telangana) in 1951 under the leadership of Vinoba Bhave. Following are some important facts related to this movement.

- This movement aimed at reducing the gap between the rich and the poor.
- Vinova Bhave organized the Sarvodaya Samaj to take up the work of non-violent transformation in India
- Jaiprakesh Narayan withdrew from active politics to join the Bhoodan movement in 1953.
- In the wake of Bhoodan movement, the first donation of land by Vedire Ramachandra Reddy was made in the village of Pochampalli in Telangana. He donated a total of 900 acres of land in this movement.
- It is also known as the Bloodless Revolution of India.

87. Option (a) is correct.

Explanation:

The United Nations Security Council is the premier global body of the United Nations, which has responsibility to ensure international peace and security. It is one of the six principal organs of the UN. The UN Charter, Article 23, deliberates the regulation regarding the election of non-permanent member to the United Nations Security Council.

- The Security Council has 15 members in which 5 permanent members with veto power
- 10 non-permanent members, five of which are elected each year by the General Assembly for a two-year term.
  - 5 from African and Asian States
  - 1 from Eastern European States
  - 2 from Latin American States
  - 2 from Western European and other States

88. Option (a) is correct.

Explanation:

- Article 243 ZD of the Indian constitution deals with the provision of district planning committee.
- Article 243ZB of the Indian constitution provides for the application of Part IX-A to the Union territories.
- Article 243ZE of the Indian constitution deals with the Committee for Metropolitan planning.
- Article 243ZC of the Indian constitution states about the Part not to apply to certain areas in Municipalities.

89. Option (c) is correct.

Explanation:

The Attorney General is the chief legal advisor to the government of India who is responsible for giving legal advice to the central government. The role/power and responsibilities of the Attorney General is following –

- R. Venkataramani is the incumbent Attorney-General for India.
- "Article 76" of the Indian Constitution under its Part-V deals with the position of Attorney General of India.
- The first law officer of the Government of India.
- He is appointed by the president of India
- He is parallel to any minister in Parliament
- He is not a full-time counsel for the government.
- He has right to speak in any house of the parliament without any right to vote
- He is not debarred from private legal practice.

90. Option (d) is correct.

Explanation:

With the aim of ending the land dispute on the border of India and Bangladesh, there was an agreement made with both countries, known as "Land Boundary Agreement Treaty – 2015." This treaty facilitated Bangladesh up to 17,160.63 acres of land from India. The Indian state Arunachal Pradesh does not touch the border of Bangladesh; so, this treaty had no effect on this state.

91. Option (c) is correct.
Explanation:
The 480 MW Phukot Hydroelectric Project is situated in Kalikot district of Nepal.

92. Option (d) is correct.
Explanation:
The Hirmand River (Helmand River) originates in the Hindu Kush mountain range near Kabul and flows into Hamoun wetland after covering a long stretch of about 1,100 km. It covers southwestern Afghanistan and eastern part of Iran. There has been serious conflict between two neighboring nations, Iran and Afghanistan regarding the sharing of water from the Helmand River. dates back to as early as the 1870s.

93. Option (b) is correct.
Explanation: 4 – 3 – 2 – 1

List – I (Bilateral Exercise)		List – II (Participating Country)	
A	Garuda Shakti	4	India and Indonesia
B	Nomadic Elephant	3	India and Mongolia
C	Mitra Shakti	2	India and Sri Lanka
D	Dharms Guardian	1	India and Japan

94. Option (a) is correct.
Explanation:
Gallantry Awards
Gallantry Awards have been instituted by the Government of India. Post-independence, the first three gallantry awards were instituted on 26th January 1950. First three Gallantry Award (Peacetime awards) in India is –
- **Ashoka Chakra:** It is one of the highest peacetime military decorations awarded for valor, courageous action or sacrifice.
- **Kirti Chakra:** It is the second highest peacetime gallantry award and is awarded for valor, courageous action and for self-sacrifice away from the field of battle.
- **Shaurya Chakra:** It is awarded to the personnel of the armed forces for instances of extraordinary gallantry.

95. Option (d) is correct
Explanation:
Centralized laboratory network
- It is a laboratory where all the samples from the clinical sites involved in a trial are sent.
- It has 15 partner facilities in 13 countries.
- It works to test vaccines which can be used during pandemic.
- India is a member of the Centralized Laboratory Network.
- The Centralized laboratory network is part of the Coalition for Epidemic Preparedness Innovations.
- It aims to identify vaccine candidates with the highest potential for combating emerging infectious diseases.

96. Option (b) is correct.
Explanation: Kavach is an automatic train protection system that helps to prevent accidents on rail tracks. Some important facts regarding Kavach is following –
- It is an indigenously developed Automatic Train Protection (ATP) system.
- It specified speed limits by automatic application.
- It it is designed and developed by the Research Design and Standards Organisation (RDSO) under the Ministry of Railways, Government of India.
- There is no contribution given by the railway technical research institute, Japan in Kavach system.
- The trials were facilitated by the South Central Railway to achieve safety in train operations
- It is a state-of-the-art electronic system with Safety Integrity Level-4 (SIL-4) standards.

97. Option (c) is correct.
Explanation:
The nova kakhovka dam is situated in Kherson Oblast, Ukraine. This huge Soviet-era dam on the Dnipro River broke a few days ago due to the war between Russian and Ukrainian armies in Ukraine.

98. Option (b) is correct.
Explanation:
Aaron James Finch is a retired Australian cricketer. He served as the captain of the Australian men's cricket team T20I. He retired on 7th February 2023.

99. Option (b) is correct.
Explanation:
Reserve Bank of India launched a financial inclusion dashboard called 'Antardrishti' on 05th Jun 2023. RBI launched 'Antardrishti' to assess and monitor the progress of financial inclusion in India.

100. Option (d) is correct.
Explanation:
The symbol of Sengol is associated with the great Chola Empire. Sengol was installed in the new parliament building of India as a symbol of the path of service duty and nation as well as an icon of India's democratic spirit.