NDA/NA
National Defence Academy/ Naval Academy

GENERAL ABILITY TEST: GENERAL STUDIES

QUESTION PAPER 2024 (II)

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 the 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 A 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 of the following statements about lysosomes is NOT correct?
(a) They are waste disposal system of the cell.
(b) They break down all inorganic materials
(c) These are also referred to as 'suicidal bags'.
(d) Lysosomes stop the entry of foreign materials.

2. Which of the following two cell organelles have their own genetic material?
(a) Endoplasmic reticulum and plastids
(b) Endoplasmic reticulum and mitochondria
(c) Mitochondria and plastids
(d) Lysosomes and Golgi apparatus

3. Which one of the following tissues helps connect two bones?
(a) Tendons **(b)** Ligaments
(c) Areolar tissue **(d)** Cartilage

4. Which one of the following is the source of energy in cells?
(a) ADP **(b)** ATP **(c)** AMP **(d)** NAD

5. In which one of the following the vegetative propagation takes place through eye buds?
(a) Potato (b) Ginger
(c) Onion (d) Sugarcane

6. The intermixing of particles of two different types of matter on their own is called:
(a) osmosis. **(b)** Brownian motion.
(c) diffusion. **(d)** conductance.

7. Which one of the following separation techniques is used for blood tests in diagnostic laboratories?
(a) Filtration **(b)** Chromatography
(c) Centrifugation **(d)** Crystallisation

8. Which one of the following elements is polyatomic?
(a) Phosphorus **(b)** Sulphur
(c) Chlorine **(d)** Aluminium

9. Which of the following anions has a valency of –3?
(a) Nitride **(b)** Nitrate
(c) Sulphide **(d)** Sulphate

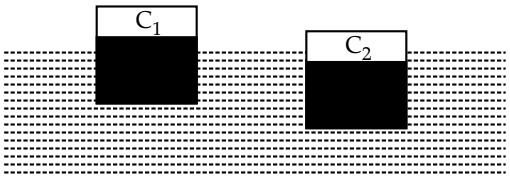
10. The mass of 0.5 mole of N_2 gas is:
(a) 7 g. **(b)** 14 g. **(c)** 21 g. **(d)** 28 g.

11. The chemical reaction:
$2AgCl\ (s) \rightarrow 2Ag\ (s) + Cl_2\ (g)$ takes place
(a) in dark.
(b) in sunlight.
(c) on heating.
(d) under high pressure.

12. Which one of the following is commonly used as an 'anti-skinning agent' in paints?
(a) Gelatin
(b) N-methyl pyrrolidone
(c) Pyridine
(d) Polyhydroxy phenol

13. Two resistances of 5.0 Ω and 7.0 Ω are connected in series and the combination is connected in parallel with a resistance of 36.0 ω. The equivalent resistance of the combination of three resistors is:
(a) 24.0 Ω. **(b)** 12.0 Ω.
(c) 9.0 Ω. **(d)** 6.0 Ω.

14. Shown in the figure are two hollow cubes C_1 and C_2 of negligible mass partially filled (depicted by darkened area) with liquids of densities ρ_1 and ρ_2, respectively, floating in water (density ρ_w). The relationship between ρ_1, ρ_2 and ρ_w is:



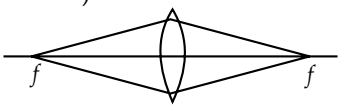
(a) $\rho_2 < \rho_w < \rho_1$. **(b)** $\rho_2 < \rho_1 < \rho_w$.
(c) $\rho_1 < \rho_2 < \rho_w$. **(d)** $\rho_1 < \rho_w < \rho_2$.

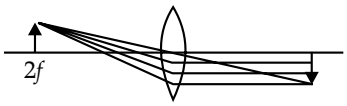
15. An astronaut whose weight on Earth is 600 N experiences weightlessness on International Space Station orbiting around Earth. It means that:
(a) acceleration of the astronaut is zero.
(b) the normal reaction of the space station floor on the astronaut is zero.
(c) the gravitational pull of Earth on the astronaut is zero.
(d) space station applies a centrifugal force on the astronaut.

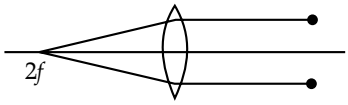
16. Which of the following statements give characteristics of contact forces?
1. It appears between an object when it is in contact with some other object.
2. It satisfies the third law of motion.
3. It may appear between a pair of solid and fluid.

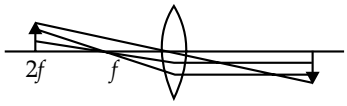
Select the answer using the code given below:
(a) 1 and 3 only **(b)** 2 and 3 only
(c) 1 and 2 only **(d)** 1, 2 and 3

17. Which one of the following figures correctly represents the ray diagram? (Consider the lens to be thin.)

(a)


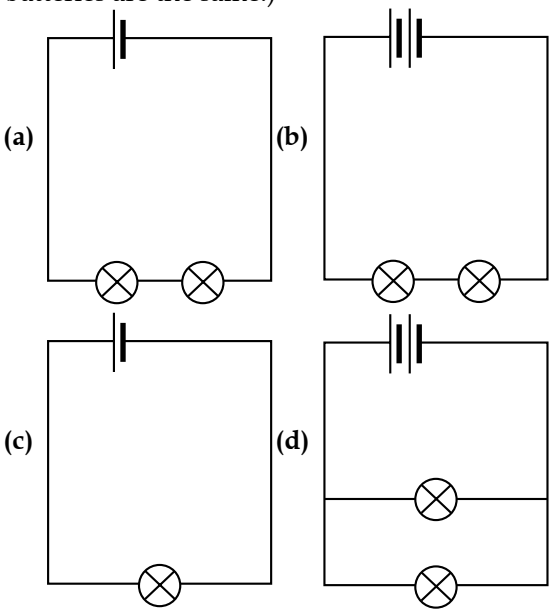
(b)


(c)


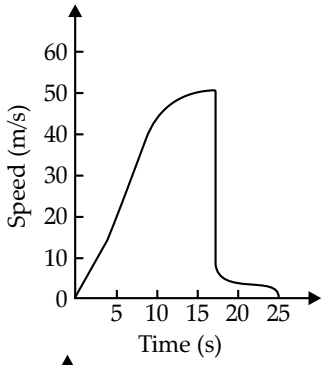
(d)


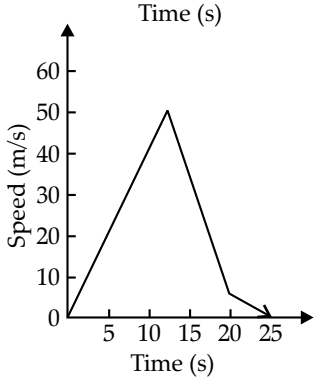
18. Lightning is due to:
(a) the flow of charges between different parts of the cloud.
(b) the short-circuiting of charges between the upper and lower surfaces of the cloud.
(c) the collection of positively charged particles on the base and collection of negatively charged particles at the top of the cloud.
(d) the induction of positive charge on the ground below the negative charge at the base of the cloud.

19. In which one of the following situations, the bulb ⊗ would glow the most? (Consider all batteries are the same.)

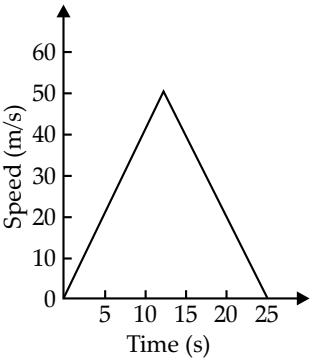


20. Which one of the following diagrams may correctly represent the motion of a skydiver during a jump?

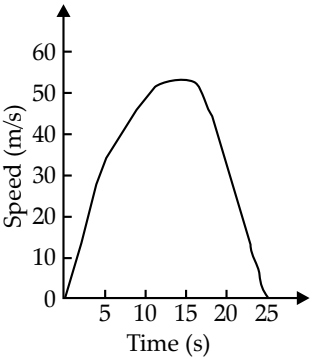
(a)


(b)


(c)

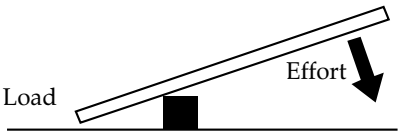


(d)



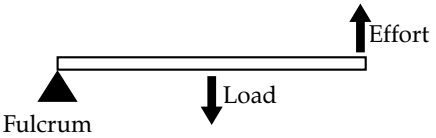
21. Which one of the following sketches correctly describes a lever of second class?

(a)

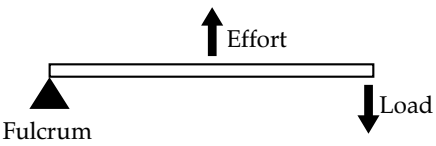


(b)

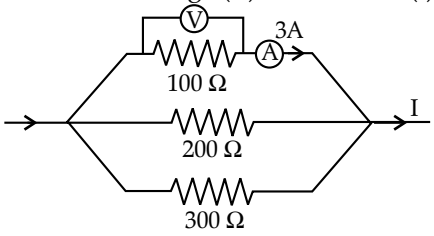
(c)



(d)



22. For an electric circuit given below, the correct combination of voltage (V) and current (I) is:



(a) $V = 900\ V$; $I = 18\ A$. **(b)** $V = 300\ V$; $I = 5.5\ A$.
(c) $V = 600\ V$; $I = 1\ A$. **(d)** $V = 300\ V$; $I = 2\ A$.

23. Which one of the following Mahajanapadas had Taxila as its capital in ancient India?
(a) Kuru **(b)** Kasi
(c) Gandhar **(d)** Avanti

24. Who among the following was the last governor general of India before the office was permanently abolished?
(a) Lord Mountbatten
(b) Chakravarti Rajagopalachari
(c) Lord Wavell
(d) Lord Linlithgow

25. Which among the following is/are the objective(s) of setting up of Planning Commission in the 1950s in India?
1. To increase production and offer employment opportunities to all
2. To make an assessment of all resources of the country

Select the answer using the code given below:
(a) 1 only **(b)** 2 only
(c) Both 1 and 2 **(d)** Neither 1 nor 2

26. Which among the following statements with regard to Five-Year Plans in India is/are correct?
1. The First and Ninth Five-Year Plans accorded high priority to agriculture.
2. The Third Plan was based on the Harrod–Domar model.
3. The Seventh Plan focused on food, work and productivity.
4. The Ninth Five-Year Plan emphasised on massive investments in the public sector.

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

27. Before the inception of the First Five-year Plan, which among the following plans were initiated in India?
1. Bombay Plan
2. People's Plan
3. Sarvodaya Plan
4. Gandhian Plan

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

28. Any land that is left fallow for more than five years is termed as:
(a) current fallow.
(b) fallow other than current fallow.
(c) culturable wasteland.
(d) barren and wasteland.

29. Which of the following statements is NOT correct regarding to Andaman and Nicobar Islands?
(a) Climate is humid, tropical coastal climate
(b) Maximum rainfall occurs between March and April.

(c) Andaman and Nicobar Islands are separated by 10-degree channel which is 150 km wide.
(d) Islands are inhabited by Negrito tribes.

30. Which one of the following local winds is NOT related to the Mediterranean Sea?
(a) Harmattan **(b)** Khamsin
(c) Sirocco **(d)** Mistral

31. Which one of the following is a landlocked water body?
(a) Mediterranean Sea
(b) Black Sea
(c) Red Sea
(d) Caspian Sea

32. Which one of the following statements with reference to Benguela Current is NOT correct?
(a) It influences the climate of the west coast of North Africa.
(b) It is a cold current.
(c) Its direction is from south to north.
(d) It flows in the Atlantic Ocean.

33. The lowest part of most bolsons is occupied by a landform called playa. Which category of landforms does it represent?
(a) Fluvial landforms
(b) Arid landforms
(c) Glacial landforms
(d) Periglacial landforms

34. Which one of the following diseases is caused due to deficiency of Vitamin D in humans?
(a) Beriberi **(b)** Scurvy
(c) Rickets **(d)** Pneumonia

35. Which one of the following combinations most appropriately represent the components of a balanced diet?
(a) Carbohydrates, vitamins, proteins, fat, minerals, fibres and water
(b) Carbohydrates, vitamins, proteins, fat and minerals
(c) Carbohydrates, vitamins, proteins, minerals and water
(d) Vitamins, proteins, fat, minerals, fibres and water

36. In which part or organ of the human body cartilage is NOT found?
(a) Nose **(b)** Trachea
(c) Bronchiole **(d)** Knee joint

37. Which part of the nephron of the human kidney is responsible for filtration of blood for excretion?
(a) Collecting duct
(b) Renal vein
(c) Ureter
(d) Bowman's capsule

38. Which phylum's organisms are known as sponges?
(a) Coelenterata **(b)** Platyhelminthes
(c) Porifera **(d)** Echinodermata

39. A point object is placed at the centre of curvature of a spherical concave mirror. Which one of the following would be the correct location of the image formed?
(a) At infinity
(b) At the centre of curvature
(c) At the focal point
(d) Between the focal point and the centre of curvature

40. Which one of the following is correct for a person suffering from myopia?
(a) The person can see near objects clearly.
(b) The person can see distant objects clearly.
(c) The person cannot distinguish colours.
(d) The person can see neither near objects nor distant objects clearly.

41. A vehicle starts moving along a straight line path from rest. In the first t seconds, it moves with an acceleration of 2 m/s^2 and then in the next 10 seconds, it moves with an acceleration of 5 m/s^2. The total distance travelled by the vehicle is 550 m. The value of time *t* is:
(a) 10 s. **(b)** 13 s. **(c)** 20 s. **(d)** 25 s.

42. A pumpkin weighs 7.5 N. On submerging it completely in water, 3/4 L of water gets displaced. The acceleration due to gravity at the place where the pumpkin was weighed is 10 m/s^2. Which one of the following is the correct value of the density of the pumpkin?
(a) 10 kg/m^3 **(b)** 100 kg/m^3
(c) 1,000 kg/m^3 **(d)** 10,000 kg/m^3

43. An incandescent electric bulb converts 20% of its power consumption into light and the remaining power is dissipated as heat. The bulb's filament has a resistance of 200 Ω and 2 A current flows through it. If the bulb remains ON for 10 h and the rate of electricity charge is ₹ 5/unit, then which among the following is the correct amount of the money spent on producing light?
(a) ₹ 5 **(b)** ₹ 6 **(c)** ₹ 7 **(d)** ₹ 8

44. Which one of the following statements best defines the concept of heat?
(a) The transformation of energy from one form to another
(b) The conversion of energy into mass and vice versa due to temperature difference
(c) The transfer of energy due to temperature difference
(d) The change in volume of a substance with temperature

45. The masses of two planets are in the ratio of 1:7. The ratio between their diameters is 2:1. The ratio of forces which they exert on each other is:
(a) 1:7. **(b)** 7:1. **(c)** 1:1. **(d)** 2:1.

46. A car weighs 1,000 kg. It is moving with a uniform velocity of 72 km/h towards a straight road. The driver suddenly presses the brakes. The car stops in 0.2 s. The retarding force applied on the car to stop it is:
(a) 100 N. **(b)** 1000 N.
(c) 10 kN. **(d)** 100 kN.

47. There is a ball with a mass of 320 g. It has 625 J potential energy when released freely from a height. The speed with which it will hit the ground is:
(a) 62.5 m/s. **(b)** 2.0 m/s.
(c) 50 m/s. **(d)** 40 m/s.

48. Starting from rest a vehicle accelerates at the rate of 2 m/s^2 towards east for 10 s. It then stops suddenly. It then accelerates again at a rate of $4f^2$ m/s^2 for the next 10 s towards the south and then again comes to rest. The net displacement of the vehicle from the starting point is:
(a) 100 m. **(b)** 200 m. **(c)** 300 m. **(d)** 400 m.

49. Which one of the following statements about the Industrial Revolution is correct?
(a) Thomas Savery invented the astrolabe.
(b) Thomas Newcomen invented chemical dyes.
(c) James Watt's invention converted the steam engine from being a mere pump into one which would provide energy to power machines in factories.
(d) Mathew Boulton discovered the technique of refining gold of impurities.

50. The first cotton mill in British India which began production in 1856 was set up by:
(a) Ghanshyam Das Birla.
(b) Jamnalal Bajaj.
(c) Ambalal Sarabhai.
(d) C. N. Davar.

51. Consider the following statements about the linguistic reorganisation of the states:
1. Gandhiji, in 1948, had argued for the reorganisation of provinces on a linguistic basis.
2. The Constituent Assembly recommended it to be incorporated in the Constitution of India.
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

52. Inspired by the Dandi March by Mahatma Gandhi, in Tamilnadu, C. Rajagopalachari led a Salt March from:
(a) Tirunelveli to Nagercoil.
(b) Kanchipuram to Mahabalipuram.
(c) Trichinopoly to Vedaranniyam on Tanjore coast.
(d) Chennai to Vellore.

53. Acharya Vinoba Bhave received the first donation of land under the Bhoodan Movement at:
(a) Ramgarh. **(b)** Garhwa.
(c) Hyderabad. **(d)** Pochampally.

54. Maize (*makka*) was introduced into India via
(a) America and England.
(b) Africa and Spain.
(c) France and Russia.
(d) Portugal and Italy.

55. Which of the following pairs of Himalayan Passes and the Ranges in which they are located is/are correctly matched?
1. Zoji La – Great Himalayas
2. Banihal Pass – Pir Panjal Range
3. Photo La – Ladakh Range
4. Khardung La – Karakoram Range
Select the answer using the code given below:
(a) 2 only **(b)** 4 only
(c) 1 and 2 only **(d)** 1, 2 and 3

56. Which one of the following statements with reference to the black cotton soils of India is NOT correct?
(a) The black cotton soils are also called 'regur'.
(b) They are highly moisture-retentive.
(c) They are rich in lime.
(d) These soils have less clay factor and hence can support a wide variety of crops and vegetables.

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

List I (Hydroelectric Power Plant)		**List II (State)**
A. Doyang	:	1. Arunachal Pradesh
B. Gomuti	:	2. Assam
C. Kapil	:	3. Tripura
D. Ranganadi	:	4. Nagaland

Code:

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

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

List I (Tropical Cyclone)	**List II (Country)**
A. Hurricanes	1. China
B. Willy-willy	2. Philippines
C. Baguio	3. Australia
D. Typhoons	4. USA

Code:

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

59. Consider the following facts about the rivers of the Indus River System:
1. The Satluj originates in Tibet where it is known as Langchen Khambab.
2. The Satluj is a classic example of an antecedent river.
3. The Jhelum is the largest tributary of the Indus River System.

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

60. Which one of the following is an example of both an igneous as well as a metamorphic rock?
(a) Gabbro **(b)** Geyserite
(c) Gneissoid **(d)** Granite

61. Which one of the following is correct?
(a) Pyroxene is commonly found in meteorites.
(b) Amphiboles form about 20% of Earth's crust.
(c) Quartz is soluble in water.
(d) The word 'sedimentary' is derived from the Latin word *kelimentum.*

62. Which one of the following processes is NOT part of chemical weathering ?
(a) Solution **(b)** Hydration
(c) Reduction **(d)** Thawing

63. What is the maximum number of electrons that can occupy the first shell of an atom?
(a) 2 **(b)** 4 **(c)** 8 **(d)** 16

64. At which temperature does liquid water shows it maximum density?
(a) 299 K **(b)** 277 K
(c) 285 K **(d)** 373 K

65. Which one of the following has the valency of 3?
(a) Carbon **(b)** Oxygen
(c) Nitrogen **(d)** Sodium

66. Which one of the following is an example of oxidation reaction?
(a) Freezing of water
(b) Dissolving sugar in water
(c) Rusting of iron
(d) Boiling of petrol

67. Which one of the following fertiliser is a source of nitrogen?
(a) Superphosphate **(b)** Potassium sulfate
(c) Bonemeal **(d)** Urea

68. For aluminium (Al) (atomic number: 13, mass number: 27), which one of the following statements is NOT correct?
(a) The number of electrons present in Al is 13.
(b) The number of protons present in Al is 13.
(c) Number of neutrons present in Al is 14.
(d) The valency of Al is 2.

69. The elemental composition of diamond is:
(a) Carbon and hydrogen
(b) Carbon and oxygen
(c) Pure carbon
(d) Pure silicon

70. Which one of the following is an example of chemical change?
(a) Sublimation of camphor
(b) Melting of ice
(c) Heating of an iron rod
(d) Mixing of NaOH and HCl

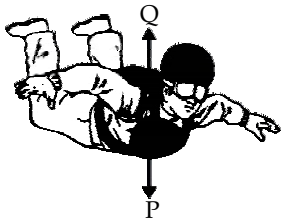
71. Which one of the following is the correct focal length of a combination of lenses of power 2.5 D and –2.0 D ?
(a) +0.5 m **(b)** –0.5 m
(c) +2.0 m **(d)** –2.0 m

72. The AC mains domestic supply current in India changes direction in every:
(a) 50 s. **(b)** $\frac{1}{50}$ s. **(c)** 100 s. **(d)** $\frac{1}{100}$ s.

73. A block of mass 2.0 kg slides on a rough horizontal plane surface. Let the speed of the block at a particular instant be 10 m/s. It comes to rest after travelling a distance of 20 m. Which one of the following could be the magnitude of the frictional force?
(a) –5 N **(b)** 20 N **(c)** 40 N **(d)** 50 N

74. Given below are the four cases in which certain heat transfer is taking place:
1. Ice is melting in a glass full of water.
2. Water is boiling in an open container.
3. A metal rod is heated in a furnace.
4. A cup of coffee is allowed to cool on a table.
In which of the above cases can Newton's law of cooling be applied?
(a) 1 only **(b)** 4 only
(c) 1 and 4 only **(d)** 1, 2 and 3

75. The figure given below shows the direction of the two forces P and Q acting on a skydiver:



Which one of the following statements is correct about the two forces?

(a) Force P is caused by the gravity and force Q is caused by the friction.
(b) When the force P is bigger than the force Q, the speed of the skydiver remains the same.
(c) After the parachute opens, force P remains the same, while force Q increases.
(d) After the parachute opens, force P decreases, while force Q increases.

76. Vijayanagara rulers claimed that they were ruling on behalf of:

(a) Lord Murugan. **(b)** Lord Venkateshwara.
(c) Shri Virupaksha. **(d)** Shri Vallabha.

77. Domingo Paes describes a king in these words: *'Of medium height, and of fair complexion and good figure, rather fat than thin; he has on his face signs of smallpox'*. Identify the king from the options given below.

(a) Krishnadeva Raya **(b)** Ram Raya
(c) Devaraya II **(d)** Devaraya I

78. In which Schedule of the Constitution of India, provisions as to disqualification on grounds of defection are given?

(a) Ninth Schedule **(b)** Tenth Schedule
(c) Eleventh Schedule **(d)** Sixth Schedule

79. Consider the following statements:

1. The duties of the Attorney General of India are to give advice to the Government of India upon such legal matters and to perform such other duties of a legal character, as may from time to time be referred to or assigned to him by the President of India.
2. The Solicitor General of India is the secondary Law Officer of the country, who assists the Attorney General, and is himself assisted by several Additional Solicitor Generals of India.

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

80. Which of the following committees does NOT consist of members from the Upper House of the Parliament?

1. Public Accounts Committee
2. Estimates Committee
3. Committee on Public Undertakings

Select the answer using the code given below:

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

81. In the passing of a Money Bill, the Rajya Sabha has limited powers in that it shall return the Bill, with or without any recommendation, within the stipulated time of:

(a) 12 days. **(b)** 21 days.
(c) 14 days. **(d)** 30 days.

82. Which of the following statements with regard to Article 19(1) of the Constitution of India is/are correct?

1. Freedoms under this Article are not absolute.
2. Reasonable restrictions can be imposed on the exercise of freedoms under this Article.

Select the answer using the code given below:

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

83. Which of the following is NOT a part of the five principles enshrined in the 'Panchsheel Agreement' signed by India and China in 1954?

(a) Mutual non-aggression
(b) Mutual non-interference
(c) Peaceful coexistence
(d) Cultural cooperation

84. Freedom fighter Kanaklata Barua sacrificed her life while participating in:

(a) Rowlatt Satyagraha
(b) Non-cooperation Movement
(c) Civil Disobedience Movement
(d) Quit India Movement

85. Where is the Coriolis effect the largest?

(a) At the Equator
(b) At the Tropic of Capricorn and Tropic of Cancer
(c) At the North Pole
(d) At 45 degrees latitude in each hemisphere

86. In which of the following Indian states do the sun's rays never strike perpendicularly?

1. Bihar
2. Chhattisgarh
3. Manipur
4. Rajasthan

Select the answer using the code given below:

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

87. Which of the following is/are east-flowing rivers in India?

1. Palar
2. Periyar
3. Pennar
4. Kalinadi

Select the answer using the code given below:

(a) 1 only **(b)** 1 and 3
(c) 2 and 4 **(d)** 4 only

88. Which of the following tributaries is/are correctly matched with the Deccan Rivers ?

	Tributary		River
1.	Bhavani	:	Krishna
2.	Kabini	:	Kaveri
3.	Manjra	:	Godavari
4.	Bhima	:	Mahanadi

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

89. Which one of the following is found in appreciable amount in laterite soil in India?
(a) Calcium **(b)** Phosphate
(c) Potash **(d)** Nitrogen

90. Consider the following statements regarding River Brahmaputra:
1. It rises in Tibet, near take Mansarovar
2. It takes a "U'' turn near Namcha Barwa and enters India through a gorge.

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

91. 'Not me, but you' is the motto of which one of the following youth organisations/schemes?
(a) Rashtriya Yuva Sashaktikaran Karyakram
(b) National Service Scheme (NSS)
(c) National Young Leaders Programme
(d) National Discipline Scheme (NDS)

92. 'Fitness ka dose, aadha ghanta roz' campaign, is associated with:
(a) Khelo India.
(b) Fit India Programme.
(c) Mera Yuva Bharat.
(d) Healthy Heart Programme.

93. Consider the following statements:
1. Kozhikode has been included in UNESCO's creative cities network as the 'City of Music'.
2. Garba of Gujarat has been declared by UNESCO as an intangible cultural heritage.
3. Gwalior has been included in UNESCO's creative cities network as the 'City of Literature'.

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

94. The ASEAN-India Millet Festival 2023, organised by the Indian Mission to ASEAN, was held in which one of the following countries?
(a) India **(b)** Indonesia
(c) Malaysia **(d)** Thailand

95. Consider the following statements:
1. The First Indian Military Heritage Festival was inaugurated in October 2023 in Pune.
2. The First Green Hydrogen Fuel Cell Bus was flagged off in India in Bangalore.
3. South Africa chaired the 15th BRICS Summit held in 2023.
4. Viksit Bharat Sankalp Yatra was flagged off in 2023 from Jharkhand.

How many of the above statements is/are correct?
(a) 1 **(b)** 2 **(c)** 3 **(d)** 4

96. Which of the following statements about 'ULLAS' scheme is/are NOT correct?
1. It's a centrally sponsored scheme which aims at securing childhood for street children.
2. It's a scheme aligned with the National Education Policy 2020 which aims at empowering adults aged 15 or above who could not get due schooling.

Select the answer using the code given below:
(a) 1 only **(b)** 2 only
(c) Both 1 and 2 **(d)** Neither 1 nor 2

97. Which one of the following statements is NOT correct about NATO?
(a) It was formed out of the signing of the Washington Treaty.
(b) Russia is not a member of this organisation.
(c) It derives its authority from the UN Charter.
(d) Finland is its latest member.

98. In January 2024, India entered into a bilateral agreement through which it will provide grant assistance to a country to construct a 20-feet Bailey bridge. Identify the country.
(a) Nepal **(b)** Bangladesh
(c) Bhutan **(d)** Myanmar

99. Which one of the following Joint Military Exercises was NOT conducted between India and the USA?
(a) Yudhabhyas **(b)** Vajra Prahar
(c) Malabar **(d)** Varuna

100. Consider the following statements:
1. India has secured 10th rank in the International Shipment category in World Bank's Logistics Performance Index Report 2023.
2. Global Maritime India Summit 2023 was held in Vishakhapatnam.
3. 'Maritime Amrit Kaal Vision 2047' was launched during Global Maritime India Summit 2023.

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

Answer Key

Q. No	Answer Key	Topic's Name	Subject's Name
1	d	Biology	Cell and Cell Organelles
2	c	Biology	Cell and Cell Organelles
3	b	Biology	Muscular system
4	b	Biology	Respiration in Plants
5	a	Biology	Vegetative propagation
6	c	Biology	Diffusion
7	c	Chemistry	Centrifugation
8	a & b	Chemistry	Atomicity
9	a	Chemistry	Valency
10	b	Chemistry	Calculation of number of moles
11	b	Chemistry	Types of reaction
12	b	Chemistry	Chemical Compounds
13	c	Physics	Electric current
14	c	Physics	Fluid mechanics
15	b	Physics	Gravitation
16	d	Physics	Newton's law of motion
17	d	Physics	Ray optics
18	d	Physics	Electrostatics
19	d	Physics	Electric current
20	a	Physics	Kinematics
21	c	Physics	Simple machines
22	b	Physics	Electric current
23	c	Ancient History	Mahajanpadas
24	b	Modern History	Governor General and Viceroy
25	c	Economy	Planning in India
26	b	Economy	Planning in India
27	d	Economy	Planning in India
28	c	Geography	Landforms
29	b	Geography	Indian Geography
30	a	Geography	Winds
31	d	Geography	Ocean
32	a	Geography	Winds
33	b	Geography	Landforms
34	c	Biology	Food and Nutrition
35	a	Biology	Food and Nutrition
36	c	Biology	Muscular system
37	d	Biology	Human Excretory system
38	c	Biology	Animal kingdom
39	b	Physics	Ray optics
40	a	Physics	Human Eye
41	a	Physics	Kinematics
42	c	Physics	Fluid
43	d	Physics	Electric current
44	c	Physics	Heat
45	c	Physics	Newton's law of motion
46	d	Physics	Newton's law of motion
47	a	Physics	Work energy and power
48	c	Physics	Kinematics
49	c	World History	Industrial Revolution
50	d	Modern History	Industrial Development

51	**a**	Post Modern History	State Reorganisation
52	**c**	Modern History	Civil Disobedience Movement
53	**d**	Ancient History	Famous Personality
54	**b**	Ancient History	Trade and Culture
55	**a**	Indian Geography	Mountain and Passes
56	**d**	Indian Geography	Soils
57	**a**	Indian Geography	Hydroelectric plants
58	**a**	World Geography	Cyclone
59	**c**	Indian Geography	River System
60	**d**	Geography	Rocks
61	**a**	Geography	Rocks
62	**d**	Geography	Earth Structure
63	**a**	Chemistry	Structure of atom
64	**b**	Chemistry	properties of matter
65	**c**	Chemistry	Structure of atoms
66	**c**	Chemistry	Types of reaction
67	**d**	Chemistry	Acid, Base, and Salt
68	**d**	Chemistry	Structure of atom
69	**c**	Chemistry	Allotrope of carbon
70	**d**	Chemistry	Physical and chemical changes
71	**c**	Physics	Ray optics
72	**d**	Physics	Frequency
73	**a**	Physics	Newton's law of motion
74	**b**	Physics	Heat transfer
75	**c**	Physics	Newton's law
76	**c**	Medieval History	Vijaynagar Dynasty
77	**a**	Medieval History	Foreign Traveller
78	**b**	Indian Polity	Schedules of Constitution
79	**c**	Indian Polity	Constitutional Bodies
80	**c**	Indian Polity	Parliamentary Committees
81	**c**	Indian Polity	Parliament
82	**c**	Indian Polity	Fundamental Rights
83	**d**	Indian Polity	Foreign Policy
84	**d**	Modern History	Famous Personality
85	**c**	World Geography	Physical Geoagraphy
86	**b**	Geography	Indian Geography
87	**b**	Indian Geography	River System
88	**b**	Indian Geography	River System
89	**c**	Indian Geography	Soils
90	**c**	Indian Geography	River System
91	**b**	Static GK	National Organisation
92	**b**	Current Affairs	Government Schemes
93	**b**	Current Affairs	National Affairs
94	**b**	Current Affairs	Events
95	**b**	Current Affairs	National Affairs
96	**b**	Current Affairs	Government Schemes
97	**a**	Current Affairs	International Organisation
98	**d**	Current Affairs	International Affairs
99	**d**	Current Affairs	Military Exercises
100	**b**	Current Affairs	National Affairs

ANSWERS WITH EXPLANATION

1. **Option (d) is correct.**
Explanation: Lysosomes are indeed known as 'suicidal bags' because they can self-destruct the cell if their enzymes leak out. They are responsible for breaking down waste materials and foreign substances within the cell. However, they do not directly stop the entry of foreign materials into the cell. This is primarily the function of the cell membrane and other immune defences.

2. **Option (c) is correct.**
Explanation: These two organelles are unique in that they possess their own DNA, separate from the cell's nuclear DNA. This autonomy allows them to replicate independently and perform specific functions within the cell.

3. **Option (b) is correct.**
Explanation: Ligaments are tough, fibrous connective tissues that connect bone to bone. They provide stability and support to joints, preventing excessive movement that could cause damage. Tendons, on the other hand, connect muscles to bones and are involved in movement. Areolar tissue and cartilage have different functions within the body.

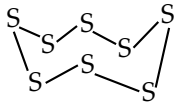
4. **Option (b) is correct.**
Explanation: ATP (adenosine triphosphate) is often referred to as the 'energy currency' of cells. It stores and releases energy in a form that cells can readily use for various processes such as muscle contraction, protein synthesis and nerve impulse transmission.

5. **Option (a) is correct.**
Explanation: In potatoes, vegetative propagation occurs through 'eye buds', which are small buds on the surface of the potato tuber. These buds can sprout and grow into new potato plants when planted in soil.

6. **Option (c) is correct.**
Explanation: Diffusion is the process by which particles of one substance spread out and mix with particles of another substance without any external force, moving from an area of higher concentration to an area of lower concentration.

7. **Option (c) is correct.**
Explanation: Centrifugation is a technique that uses a high-speed spinning motion to separate components of a mixture based on their density. In blood tests, centrifugation is used to separate the blood into its various components, such as red blood cells, white blood cells, platelets and plasma. This separation allows for the analysis of specific components and the diagnosis of various medical conditions.

8. **Option (a) and (b) are correct.**
Explanation: Phosphorus is polyatomic because it commonly exists in nature as P_4 molecules, where four phosphorus atoms are bonded together. Sulphur is polyatomic in nature which exist in S_8 forms. Sulphur atoms are bonded together with single bonds to form crown shape.



9. **Option (a) is correct.**
Explanation: Nitride ion have a valency of -3. Nitrogen atom contains 7 valence electrons which gains 3 electrons to complete the octet and form N^{3-} ion.

$$\underset{2,\,5}{N} + 3e^- \longrightarrow \underset{2,\,8}{N^{3-}}$$

10. **Option (b) is correct.**
Explanation: Number of mole

$$= \frac{\text{weight of substance}}{\text{molar mass}}$$

Given,
Number of moles = 0.5 mole
Molar mass of N_2 = 28 g
Mass of 0.5 mole N_2 = 28×0.5
= 14 g

11. Option (b) is correct.

Explanation: AgCl is a photosensitive compound which gets decomposed in the presence of sunlight and forms Ag and Cl_2.

$2AgCl \longrightarrow 2Ag + Cl_2$

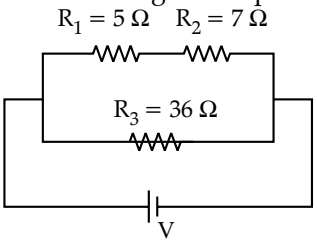
12. Option (b) is correct.

Explanation: N-methyl pyrrolidone (NMP) is a common anti-skinning agent used in paints. It works by reducing the surface tension of the paint, preventing the formation of a skin on the surface. This helps ensure a smooth and even finish when the paint dries.

Gelatin, pyridine and polyhydroxy phenol are not typically used as anti-skinning agents in paints. Gelatin is a protein derived from animal tissues, pyridine is an organic compound, and polyhydroxy phenol is a type of phenol. While these substances may have other uses in paints or coatings, they are not primarily used as anti-skinning agents.

13. Option (c) is correct.

Explanation: According to the question



Equivalent resistance of R_1 and R_2 be

$R' = R_1 + R_2 = 5 + 7 = 12\ \Omega.$

The total equivalent resistance is

$$\frac{1}{R_e} = \frac{1}{R'} + \frac{1}{R_3} = \frac{1}{12} + \frac{1}{36}$$

$$\Rightarrow \frac{1}{R_e} = \frac{3+1}{36} = \frac{4}{36}$$

$$R_e = \frac{36}{4} = 9\ \Omega.$$

14. Option (c) is correct.

Explanation: The forces acting on the body is weight of the body and upthrust.

From the given figure, both the cubes are floating in the water. So the weight of the cubes will be less than the upthrust.

Therefore,

$\rho_w > \rho_1$ and $\rho_w > \rho_2$

$\rho_1 < \rho_2$ as there is more up-thrust on C_1.

Hence, $\rho_1 < \rho_2 < \rho_w$.

15. Option (b) is correct.

Explanation: The astronaut and the International Space Station are in a state of free fall. Therefore, the normal contact force does not comes into play giving the feeling of weightlessness.

16. Option (d) is correct.

Explanation: Characteristics of contact force:

(a) Contact force is applied by objects in contact with each other.

(b) Contact force is governed by Newton's law.

(c) Contact force can appear between solid and a fluid such as drag and buoyancy.

Therefore, all options are correct.

17. Option (d) is correct.

Explanation: If an object is placed at 2f, the image will be formed at some distance opposite to the lens. Thus, the image formed is real, inverted and of same size as the object.

18. Option (d) is correct.

Explanation: During thunderstorm, the positive charge moves to the top of cloud and the negative charge moves to tower edge of cloud. So the lower part of the cloud gets negatively charged.

It induces positive charge on ground.

The magnitude of charges rises over time causes lightening.

19. Option (d) is correct.

Explanation: In option (d), the two bulbs connected in parallel and two cells are connected in series which gives rise to the voltage. The voltage received by two bulbs will be equal. Therefore, the bulb will glow brighter.

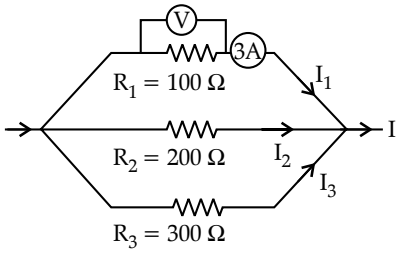
20. Option (a) is correct.

Explanation: When the skydiver jumps, his speed increases with a constant rate of acceleration. Just after opening the parachut, his acceleration decreases and velocity becomes constant. Due to opening of parachut, the drag decreases the speed and retards the motion. Before landing on the ground, the speed becomes constant, and after landing, it becomes zero.

21. Option (c) is correct.

Explanation: A second-level lever has the fulcrum at one end, the applied force at the other and the load at the middle.

22. Option (b) is correct.
Explanation:



As all resistors are in parallel, so all have same voltage.

$$V = I_1 R_1 = 3 \times 100 = 300V$$

Current (I_2) via $R_2 = \frac{300}{200} = 1.5$ A

Current (I_3) via $R_3 = \frac{300}{300} = 1.0$ A

Hence, net current (I) $= I_1 + I_2 + I3$
$= 3.0 + 1.5 + 1.0$
$= 5.5$ A

23. Option (c) is correct.
Explanation: Taxila was the capital of the Gandhara Mahajanapada in ancient India. Taxila, also known as Takshashila, was an important city in the kingdom of Gandhara. It was located on the eastern bank of the Indus River, which was a key junction between the Indian subcontinent and Central Asia. Taxila was possibly founded around 1000 BCE. Gandhara was one of the 16 Mahajanpadas; its present location is in Afghanistan and some parts of it lie in Pakistan. We find the mention of Gandhara in Anguttara Nikaya (a Buddhist source).

24. Option (b) is correct.
Explanation: Chakravarti Rajagopalachari, popularly known as Rajaji, was the last governor general of India before the office was abolished and replaced by the President of India. He served from June 1948 to January 1950. Rajaji was the first Indian to hold the position of governor general. Lord Mountbatten was the last British governor general of India.

25. Option (c) is correct.
Explanation: The Planning Commission was established in March 1950 to achieve the government's developmental objectives. The Planning Commission was charged with the responsibility of assessing all resources of the country, augmenting deficient resources, formulating plans for the most effective and balanced utilisation of resources and determining priorities. It was entrusted with the work of economic and social development as envisaged in the preamble, the fundamental rights as well as Directive Principles of State Policy of the Constitution. The planning commission was charged with the service of the opportunities to all for employment in the service of the community. Hence, both statements are correct.

26. Option (b) is correct.
Explanation: The First and Ninth Five-Year Plans accorded high priority to agriculture. Both the First and Ninth Five-Year Plans focused on agriculture. Hence, Statement 1 is correct.
The First Five-Year Plan was based on the Harrod–Domar model. Hence, Statement 2 is not correct.
The Seventh Five-Year Plan (1985–1990) focused on improving productivity, generating employment (work) and attaining self-sufficiency in food. It aimed to make growth more inclusive by addressing the needs of the weaker sections of society. Hence, Statement 3 is correct.
The Ninth Plan aimed at accelerating economic growth, and its strategy focused more on the private sector's role and encouraging public–private partnerships rather than massive public sector investment. Hence, Statement 4 is not correct.

27. Option (d) is correct.
Explanation: Before the First Five-Year Plan, several plans were proposed in India:
Bombay Plan (1944): Proposed by industrialists, it focused on industrialisation with state support.
People's Plan (1945): Advocated by M.N. Roy, it emphasised a socialist economy with agricultural development.
Sarvodaya Plan (1950): Proposed by Jayaprakash Narayan, it focused on rural development and self-sufficiency.
Gandhian Plan (1944): Based on Gandhian ideals, it emphasised self-reliance and small-scale industries.
Hence, all these plans were conceptualised before India's First Five-Year Plan.

28. Option (c) is correct.
Explanation: Land left uncultivated for more than five years is categorised as a culturable wasteland.
Culturable waste land: Land that's suitable for cultivation but left uncultivated for five or more years in a row, including the current

year. Factors like erosion, waterlogging, or salinity can restrict the land's use. Reclamation practices can improve the land for future cultivation.
Current fallow land: Land left uncultivated for one agricultural year or less.
Fallow other than current fallow: Land left uncultivated for 1-5 agricultural years.
Barren and wasteland: Land that cannot be cultivated with current technology, such as hills, deserts and ravines.

29. Option (b) is correct.
Explanation: The Andaman and Nicobar Islands experience a humid, tropical and coastal climate, which is true. The maximum rainfall in these islands typically occurs during the southwest monsoon season, between May and September, rather than in March and April. The Andaman Islands and Nicobar Islands are indeed separated by the 10-degree channel, which is approximately 150 km wide, and the islands are inhabited by indigenous Negrito tribes. Hence, Statement 2 is not correct and the remaining statements are correct.

30. Option (a) is correct.
Explanation: Harmattan is a dry and dusty trade wind that blows from the Sahara over the West African region towards the Gulf of Guinea, and it is not related to the Mediterranean Sea.
Khamsin is a hot, dry, sandy wind from the south that affects Egypt and other regions in the eastern Mediterranean.
Sirocco is a hot, dry wind that originates in the Sahara and moves northward across the Mediterranean Sea to Southern Europe.
Mistral is a strong, cold north westerly wind that blows from southern France into the Mediterranean Sea, affecting areas like the French Riviera.
Therefore, the Harmattan wind is the one not related to the Mediterranean Sea.

31. Option (d) is correct.
Explanation: The Caspian Sea is the world's largest landlocked body of water. Located between Asia and Europe, it's sometimes called a lake because it has characteristics of both lakes and seas.
Mediterranean Sea: It is connected to the Atlantic Ocean through the Strait of Gibraltar.
Black Sea: It is connected to the Mediterranean Sea via the Bosporus Strait.
Red Sea: It is connected to the Indian Ocean through the Bab al-Mandeb Strait and the Suez Canal.

32. Option (a) is correct.
Explanation: The Benguela Current is an oceanic current that is a branch of the Southern Hemisphere's West Wind Drift. It flows northward along the west coast of southern Africa nearly to the Equator in the South Atlantic Ocean before combining with the westward-flowing Atlantic South Equatorial Current. Hence, Statement 1 is not correct.

33. Option (b) is correct.
Explanation: A playa is a type of landform found in arid regions, particularly in bolsons (depressions) where water collects temporarily, forming a dry, flat lake bed. It is characteristic of arid landforms, where it represents a seasonal or intermittent lake that often dries up, leaving behind saline or mud flats. Playas are not typically associated with fluvial, glacial or periglacial landform categories.

34. Option (c) is correct.
Explanation: Rickets is a disease caused by a deficiency of Vitamin D, calcium or phosphate. It leads to weakened and softened bones in children, resulting in deformities such as bowed legs. Vitamin D is essential for the absorption of calcium, and its deficiency impairs bone formation.

35. Option (a) is correct.
Explanation: A balanced diet includes all the essential nutrients needed by the body in the right proportions. These nutrients include carbohydrates (for energy), proteins (for growth and repair), fats (for energy and cellular functions), vitamins and minerals (for various bodily functions), fibres (for digestive health) and water (for hydration and bodily processes). This combination ensures the proper functioning and maintenance of the body.

36. Option (c) is correct.
Explanation: Cartilage is a flexible connective tissue found in various parts of the body such as the nose, trachea and knee joints. However, bronchioles, the smaller airways in the lungs, do not contain cartilage. Instead, bronchioles are made up of smooth muscle and epithelial tissue, allowing them to regulate airflow by contracting or expanding.

37. Option (d) is correct.
Explanation: Bowman's capsule is the initial part of the nephron where filtration occurs. Blood is filtered through a network of capillaries called the glomerulus, which is located within Bowman's capsule. The filtrate then enters the

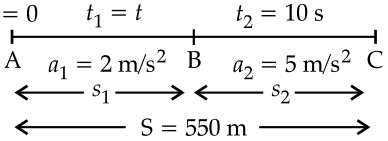
tubules of the nephron for further processing and ultimately excretion as urine.

38. Option (c) is correct.
Explanation: Organisms belonging to the phylum Porifera are commonly known as sponges. They are simple multicellular animals that are characterised by their porous structure and lack of true tissues. Sponges are filter feeders that live attached to rocks or other substrates in aquatic environments.

39. Option (b) is correct.
Explanation: When an object is placed at centre of curvature of a concave mirror, the image is formed at centre of curvature only. The image thus formed is real inverted and equal in size.

40. Option (a) is correct.
Explanation: Myopia, also known as nearsightedness, is a condition where a person can see nearby objects clearly but has difficulty seeing distant objects. This is caused by the eyeball being too long or the lens focusing the light in front of the retina. To correct myopia, concave lenses are typically used.

41. Option (a) is correct.
Explanation:



$$S = S_1 + S_2$$

$$\Rightarrow S_1 + S_2 = 550 \quad \text{...(i)}$$

From A to B:

$$S_1 = ut_1 + \frac{1}{2}at_1^2$$

$$S_1 = 0 + \frac{1}{2}\times 2 \times t^2$$

$$S_1 = t^2 \quad \text{...(ii)}$$

Velocity at B:

$$v_B^2 = u^2 + 2a_1s_1$$

$$v_B^2 = 0 + 2 \times 2 \times t^2 \qquad (\because s_1 = t^2)$$

$$v_B^2 = 4t^2$$

$$\therefore \ v_B = 2t \quad \text{...(iii)}$$

Now from B to C:

$$S_2 = v_B t_2 + \frac{1}{2}at_2^2$$

$$\Rightarrow S_2 = 2t \times 10 + \frac{1}{2}\times 5 \times (10)^2 \qquad (\because V_B = 2t)$$

$$S_2 = 20t + 250 \quad \text{...(iv)}$$

From equation (i):

$$S_1 + S_2 = 550$$

$$\Rightarrow \quad t^2 + 20t + 250 = 550$$

$$\Rightarrow \quad t^2 + 20t - 300 = 0$$

$$\Rightarrow \quad t^2 + 30t - 10t - 300 = 0$$

$$\Rightarrow t(t + 30) - 10(t + 30) = 0$$

$$t = 10, -30$$

$$t = 10$$

42. Option (c) is correct.
Explanation: W = 7.5 N

$mg = 7.5$ N

$$m = \frac{7.5}{g} = \frac{7.5}{10} = 0.75 \text{ kg}$$

Now,

Volume of pumpkin = volume of water displaced

$$\therefore \ V_{\text{pumpkin}} = \frac{3}{4}L = 0.001 \times \frac{3}{4} m^3$$

$$= 0.001 \times 0.75 \ m^3$$

$$P = \frac{m}{v} = \frac{0.75}{0.001 \times 0.75} = \frac{1}{0.001}$$

$$P = 1000 \text{ kg/m}^3$$

43. Option (d) is correct.
Explanation: $P = I^2R$

$$P = (2)^2 \times 200 = 800 \text{ W}$$

$$P = 0.8 \text{ kW}$$

Now, only 20% is consumed into light.

Therefore, $P = 0.8 \times \frac{20}{100} = 0.16$ kW

Now, $P = \frac{E}{t}$

$$E = P \times t = 0.16 \text{ kW} \times 10 \text{ h}$$

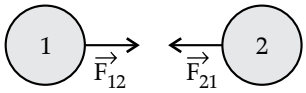
$$E = 1.6 \text{ kWh} = 1.6 \text{ unit}$$

$$\text{Cost} = 1.6 \times 5 = ₹ 8$$

44. Option (c) is correct.
Explanation: **Heat:** It is a form of energy which get transferred due to temperature difference.

45. Option (c) is correct.
Explanation: Given:

$$\frac{m_1}{m_2} = \frac{1}{7} \text{ and } \frac{d_1}{d_2} = \frac{2}{1}$$



According to Newton's third law

$$\left|\vec{F}_{12}\right| = \left|\vec{F}_{21}\right|$$

So the ratio of forces which they exert on each other is:

$$\frac{\left|\vec{F}_{12}\right|}{\left|\vec{F}_{21}\right|} = \frac{1}{1}$$

46. Option (d) is correct.

Explanation: Given data:

$$m = 1{,}000 \text{ kg}$$

$$u = 72 \text{ km/h} = 72 \times \frac{5}{18}$$

$$= 20 \text{ m/s}$$

$$t = 0.2 \text{ s}$$

$$v = 0 \text{ m/s}$$

From first equation of motion:

$$a = \frac{v-u}{t} = \frac{0-20}{0.2} = \frac{-20}{0.2}$$

$$a = \frac{-100 \text{ m}}{s^2}$$

Retarding force:

$$F = ma$$

$$= 1000 \times -100$$

$$= -100 \times 1{,}000 \text{ N}$$

$$= -100 \text{ KN}$$

Negative sign represents retarding force.

47. Option (a) is correct.

Explanation: Given value:

$$m = 320 \text{ g} = 0.32 \text{ kg}$$

$$U = 625 \text{ J}$$

Therefore:

$$K.E = U \quad \text{(from conservation of energy)}$$

$$\Rightarrow \frac{1}{2}mv^2 = mgh$$

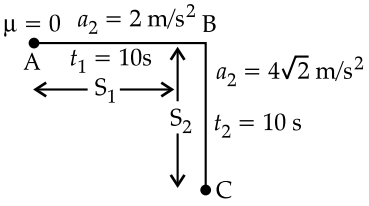
$$\Rightarrow \frac{1}{2}mv^2 = 625$$

$$\Rightarrow \quad v^2 = \frac{2 \times 625}{0.32}$$

$$\Rightarrow \quad v = \sqrt{\frac{2 \times 625}{0.32}} = 62.5 \text{ m/s}$$

48. Option (c) is correct.

Explanation:



From A → B:

$$S_1 = ut_1 + \frac{1}{2}a_1{t_1}^2$$

$$S_1 = \frac{1}{2} \times 2 \times (10)^2$$

$$S_1 = 100 \text{ m} \qquad \text{...(i)}$$

Frome B → C:

$$S_2 = ut_2 + \frac{1}{2}a_2{t_2}^2$$

$$S_2 = \frac{1}{2} \times 4\sqrt{2} \times (10)^2$$

$$S_2 = 2\sqrt{2} \times 100 = 200\sqrt{2}$$

$$\text{Displacement} = \sqrt{(100)^2 + (200\sqrt{2})2}$$

$$= \sqrt{1000 + 40000 \times 2}$$

$$= \sqrt{10000 + 80000} = \sqrt{90000}$$

$$= 300 \text{ m}$$

49. Option (c) is correct.

Explanation: James Watt's invention converted the steam engine from being a mere pump into one which would provide energy to power machines in factories: This is correct. James Watt improved the steam engine, making it more efficient and suitable for powering machinery, which played a crucial role in the Industrial Revolution.

50. Option (d) is correct.

Explanation: India's first cotton mill was set up in Bombay. Bombay Spinning and Weaving Company was the first cotton mill to be established in Bombay, India, on 7 July 1854 at Tardeo by Cowasjee Nanabhoy Davar (1815–1873) and his associates. Sir William Fairbairn designed this company and the production started in the year 1856.

51. Option (a) is correct.

Explanation: Gandhiji did indeed advocate for the reorganisation of provinces on a linguistic basis in 1948. He believed that this would promote unity and reduce regional tensions. Hence, Statement 1 is correct.

The Constituent Assembly, the body responsible for drafting India's Constitution, did not explicitly recommend linguistic reorganisation. However, the principle of linguistic states was incorporated into the Constitution, and the States Reorganisation Act of 1956 was passed to implement this principle. Hence, Statement 2 is not correct.

52. Option (c) is correct.

Explanation: C. Rajagopalachari spearheaded the Salt Satyagraha in Tamil Nadu. Drawing inspiration from Mahatma Gandhi's Dandi March, Rajagopalachari and a group of 100 men marched to Vedaranyam in April 1930, where they extracted salt from seawater to challenge the British-imposed salt tax. Starting from Tiruchi on 13 April, Rajagopalachari arrived in Vedaranyam on 28 April. This Salt Satyagraha was part of Gandhi's broader civil

disobedience campaign against British colonial rule in India.

53. Option (d) is correct.

Explanation: The Bhoodan Movement, also known as the Land Gift Movement, was a voluntary land reform initiative in India launched by Acharya Vinoba Bhave in 1951. The first land donation was received by Bhave at Pochampalli village in Telangana. In 1953, Jayaprakash Narayan left active politics to join the Bhoodan Movement.

54. Option (b) is correct.

Explanation: Maize, also known as makka, was brought to India from Africa and Spain by the Portuguese in the sixteenth century, following Vasco da Gama's discovery of trade routes in 1498. It soon became a significant crop in western India and is now the country's third-largest food crop, contributing 9% to India's food supply.

55. Option (a) is correct.

Explanation: The Zoji La Pass is situated in the Zanskar Range of the Himalayas, within the Kargil district of Ladakh, an Indian Union Territory.

The Banihal Pass is located in the Pir Panjal Range, which extends from east–southeast to west–northwest through Himachal Pradesh and Jammu and Kashmir.

Photu La Pass, found on the Srinagar-Leh highway in the Zanskar Range, is noted as the highest point on this route, surpassing Zoji La.

The Khardung La Pass, part of the Ladakh Range in Jammu and Kashmir, lies north of Leh. It serves as a key access point to the Shyok and Nubra valleys and provides a motorable route from Leh to Kashgar in Central Asia.

Therefore, only pair 2 is correctly matched.

56. Option (d) is correct.

Explanation: Black cotton soils are commonly referred to as regur soils. Black cotton soils have good moisture retention capacity due to their clayey nature. They are rich in lime. Black cotton soils are rich in clay content, which is a key characteristic that gives them their unique properties. This high clay content can be a challenge for some crops, as it can make the soil heavy and difficult to work with. Therefore, the statement that black cotton soils have less clay factor is incorrect.

57. Option (a) is correct.

Explanation:

Hydroelectric Power Plant	state
Doyang	The project is located in the Wokha district of Nagaland.
Gumti	The Gumti Hydroelectric Project is located in Tripura, India. It's the first hydroelectric project in the state and is situated at Thirthmukh.
Kopili	The Kopili Hydro Electric Plant is in the Dima Hasao District of Assam, about 270 km from Guwahati via Nagaon.
Ranganadi	This project is located in the Lower Subansiri district of the state of Arunachal Pradesh in the Ranganadi basin and the adjoining Dikrong basin.

Therefore, the correct option is (a).

58. Option (a) is correct.

Explanation:

Tropical Cyclone	Country
Hurricanes	USA
Willy-willy	Australia
Baguio	Philippines
Typhoons	China

Therefore, the correct option is (a).

59. Option (c) is correct.

Explanation: The Indus system comprises the main Indus, Jhelum, Chenab, Ravi, Beas and Sutlej. The basin is mainly shared by India and Pakistan with a small share for China and Afghanistan. Jhelum and Ravi join Chenab, Beas joins Sutlej and then Sutlej and Chenab join to form Panjnad, 10 miles north of Uch Sharif in Muzaffar Garh district. The combined stream runs southwest for approximately 44 miles and joins the Indus River at Mithankot. Sutlej is the longest tributary of the Indus. The Chenab River is the largest tributary of the river Indus. The Satluj originates in Tibet where it is known as Langchen Khambab. The Satluj River is considered an antecedent river because it existed before the mountain range (the Himalayas) that it now cuts through was uplifted. Therefore, Statements 1 and 2 are correct, but statement 3 is not correct.

60. Option (d) is correct.
Explanation: Granite is an example of both an igneous and a metamorphic rock. Granite is an igneous rock that forms when magma cools underground. It's made up of minerals like quartz, feldspar and mica. When granite is subjected to high heat and pressure, it turns into a metamorphic rock called gneiss.

61. Option (a) is correct.
Explanation: Pyroxene is commonly found in meteorites: This is correct. Pyroxene is a common mineral in meteorites, particularly in those that are classified as stony meteorites.
Amphiboles form about 20% of Earth's crust: This is incorrect. Amphiboles are a significant group of minerals but do not constitute 20% of Earth's crust. Feldspar and quartz are more prevalent in Earth's crust.
Quartz is soluble in water: This is incorrect. Quartz is insoluble in water and is a very stable mineral.
The word 'sedimentary' is derived from the Latin word *kelimentum*: This is incorrect. The word 'sedimentary' comes from the Latin word 'sedimentum,' meaning settling' or 'to settle.'
Therefore, Statement 1 is correct and the remaining are incorrect.

62. Option (d) is correct.
Explanation: Thawing is not a part of chemical weathering.
Chemical weathering involves the breakdown of rocks and minerals due to chemical reactions. Thawing, on the other hand, is a physical process where frozen water melts, causing mechanical stress on rocks and leading to their physical breakdown.
Here are the processes involved in chemical weathering:
Solution: The dissolution of minerals in water
Hydration: The absorption of water by minerals that causes them to expand and weaken.
Reduction: The loss of oxygen from minerals.
Therefore, the correct answer is option 4

63. Option (a) is correct.
Explanation: The first shell of an atom that can ocupy the first shell of an atom $= 2(n)^2$,
where $n = 1, 2(1)^2 = 2$

64. Option (b) is correct.
Explanation: The maximum density of water at 4°C or 277 K.

65. Option (c) is correct.
Explanation:

	Element	Group No.	Valency
A	Carbon	14	4
B	Oxygen	16	2
C	Nitrogen	15	3
D	Sodium	1	1

66. Option (c) is correct.
Explanation: Rusting of iron is an example of oxidation reaction. During rusting, iron gets oxidised into fe^{2+} ion further oxidised into fe^{3+} to form hydrated oxide $fe_2O_3.xH_2O$

67. Option (d) is correct.
Explanation: Urea is the source of nitrogen; the formula of urea is NH_2CONH_2.

68. Option (d) is correct.
Explanation: The atomic number and mass number of Al are 13 and 27, respectively. The number of electron and proton are 13 and 13, respectively, while neutron is 14.
Aluminium $e^- = 13$, P = 13
($z = 13$) $n = 14$
The valency of aluminium is 3; therefore, option (d) is incorrect.

69. Option (c) is correct.
Explanation: The elemental composition of diamond is pure carbon. In diamond, only carbon is present tetrahedrally. The bond length of C–C in diamond is 1.54 Å.

70. Option (d) is correct.
Explanation:

A	Sublimation of camphor	Physical change of solid into gas
B	Melting of ice	Physical change of ice into liquid
C	Heating of iron rod	Temperature changes only
D	Mixing of NaOH and HCl	Chemical change

$NaOH + HCl \rightarrow NaCl + H_2O$
The chemical of acid and base changes to form salt and water.

71. Option (c) is correct.
Explanation: $P_1 = 2.5$ D
$P_2 = -2.0$ D
$P = P_1 + P_2 = 2.5 - 2.0$
$= 0.5$ D
$$f = \frac{1}{P} = \frac{1}{0.5} = +2 \text{ m}$$

72. Option (d) is correct.
Explanation: AC current reverse its direction periodically. Most power stations produces AC current.
In India, the frequency is 50 Hz. And AC current changes its direction after every $\frac{1}{100}$ second.

73. Option (a) is correct.
Explanation: Given:
$m = 2$ kg
$u = 10$ m/s
$s = 20$ m
$v = 0$ m/s
From third equation of motion:
$v^2 = u^2 + 2as$
$\Rightarrow \quad 0 = (10)^2 + 2 \times a \times 20$
$\Rightarrow \quad -40a = 100$
$a = \frac{-100}{40} = -2.5 \text{ m/s}^2$
Now, $F = ma$
$= 2 \times -2.5 = -5N$

74. Option (b) is correct.
Explanation: Newton's law of cooling is applicable when a liquid is allowed to cool down in surrounding.

75. Options (c) are correct.
Explanation: P → Gravity
Q → Air resistance
P remains same, while Q increases after the parachute opens.

76. Option (c) is correct.
Explanation: The Vijayanagara rulers claimed that they were ruling on behalf of Shri Virupaksha, who was considered a manifestation of Lord Shiva. The Virupaksha Temple in Hampi was an important religious and cultural centre during the Vijayanagara Empire.

77. Option (a) is correct.
Explanation: Domingo Paes, a Portuguese traveller, visited the Vijayanagara Empire during the reign of Krishnadeva Raya. In his account, Paes described the king as a just and powerful ruler, feared by his enemies. He noted the king's medium height, fair complexion, and good figure, marked by smallpox scars. Paes was impressed by the grandeur of the empire, its vast cities and thriving trade. His vivid description provides valuable insight into Krishnadeva Raya's reign and the Vijayanagara Empire.

78. Option (b) is correct.
Explanation: The provisions regarding disqualification on grounds of defection in the Constitution of India are found in the Tenth Schedule.
This schedule, added to the Constitution in 1985, outlines the circumstances under which a member of a legislature can be disqualified for defecting from their political party. The Tenth Schedule is aimed at preventing political defections and ensuring stability in the government.

79. Option (c) is correct.
Explanation: **Statement 1:** This statement is correct. The Attorney General of India is the chief legal advisor to the Government of India. The duties include giving advice on legal matters to the Government of India and performing other legal duties assigned by the President. This role is outlined in Article 76 of the Indian Constitution.
Statement 2: This statement is also correct. The Solicitor General of India is the second highest law officer in the country after the Attorney General. The Solicitor General assists the Attorney General in fulfilling their duties and is supported by several Additional Solicitor Generals.
Therefore, both statements are correct.

80. Option (c) is correct.
Explanation: The Public Accounts Committee consists of members from both the Lok Sabha (House of the People) and the Rajya Sabha (Council of States). It presently comprises 22 members (15 members elected by the Lok Sabha Speaker and 7 members elected by the Rajya Sabha Chairman) with a term of one year only.
The Estimates Committee consists of 30 exclusively members from the Lok Sabha. No members from the Rajya Sabha are included in the Estimates Committee.
The Committee on Public Undertakings (COPU) has 22 members, with 15 elected from the Lok Sabha and 7 from the Rajya Sabha.
Hence, only the Estimates Committee does not include members from the Upper House of the Parliament (Rajya Sabha).

81. Option (c) is correct.
Explanation: The Rajya Sabha has limited powers concerning money bills and can only

make recommendations and cannot reject or amend the bill. The Rajya Sabha must return the bill to the Lok Sabha within 14 days, with or without recommendations. The Lok Sabha can accept or reject any recommendations made by the Rajya Sabha.

82. Option (c) is correct.

Explanation: **Freedoms under this Article are not absolute:** This statement is correct. Article 19(1) of the Indian Constitution provides citizens with certain fundamental freedoms, such as the freedom of speech and expression, assembly, association, movement, residence and profession. However, these freedoms are not absolute and can be restricted under specific circumstances.

Reasonable restrictions can be imposed on the exercise of freedoms under this Article: This statement is also correct. 'Reasonable restrictions' as outlined in Article 19(2) of the Constitution allow for restrictions in the interests of the security and sovereignty of India, friendly relations with foreign states, public order, decency or morality about contempt of court, defamation or incitement to an offence.

83. Option (d) is correct.

Explanation: The 'Panchsheel Agreement' signed by India and China in 1954 outlined five principles of peaceful coexistence, which are:
Mutual respect's territorial integrity and sovereignty.

- Mutual non-aggression.
- Mutual non-interference in each other's internal affairs.
- Equality and mutual benefit.
- Peaceful coexistence.

Cultural cooperation, while an important aspect of bilateral relations, is not one of the original five principles of the Panchsheel Agreement.

84. Option (d) is correct.

Explanation: Kanaklata Barua, a freedom fighter from Assam, sacrificed her life while participating in the Quit India Movement. She was shot dead by the British police on 20 September 1942, while leading a procession carrying the Indian national flag in support of the movement initiated by Mahatma Gandhi, which called for an end to British rule in India.

85. Option (c) is correct.

Explanation: The Coriolis effect is strongest at the poles (both North and South Poles) and is essentially zero at the Equator. It causes moving objects, such as wind or ocean currents, to deflect to the right in the Northern Hemisphere and the left in the Southern Hemisphere. The effect increases with latitude, reaching its maximum at the poles.

86. Option (b) is correct.

Explanation: The sun's rays are never perpendicular to places located north of the Tropic of Cancer (approximately 23.5° N latitude). Among the given options:

- Bihar and Manipur are both located north of the Tropic of Cancer, so the sun's rays are never perpendicular in these states.
- Chhattisgarh and Rajasthan have regions that are crossed by the Tropic of Cancer, where the sun's rays can be perpendicular at least once a year.

Therefore, Bihar (1) and Manipur (3) are the correct answers.

87. Option (b) is correct.

Explanation: **Palar River:** It is an east-flowing river in southern India that flows into the Bay of Bengal.

Periyar River: It is primarily a west-flowing river, flowing into the Arabian Sea, making it not applicable to this context.

Pennar River: It is also an east-flowing river in southern India, emptying into the Bay of Bengal.

Kalinadi River: This river, also known as Kali River, flows westwards into the Arabian Sea, not eastwards.

Therefore, the east-flowing rivers among the given options are Palar and Pennar.

88. Option (b) is correct.

Explanation: Bhavani: It is a tributary of the Kaveri River, not the Krishna River, so this is incorrectly matched.
Kabini: It is correctly matched as a tributary of the Kaveri River.
Manjra: It is correctly matched as a tributary of the Godavari River.
Bhima: It is a tributary of the Krishna River, not the Mahanadi River, so this is incorrectly matched.

Thus, the correctly matched tributaries and their respective Deccan Rivers are Kabini (Kaveri) and Manjra (Godavari).

89. Option (c) is correct.
Explanation: Potash is found in appreciable amounts in laterite soil in India. Laterite soil is characterised by its reddish colour and high iron oxide content. It is often found in tropical and subtropical regions, including parts of India. Due to intense leaching, laterite soil is generally deficient in nutrients like calcium, phosphate and nitrogen. However, potash is less prone to leaching and can be found in significant quantities in this type of soil. Therefore, the correct answer is (c): Potash.

90. Option (c) is correct.
Explanation: **Statement 1:** The Brahmaputra River originates in the Angsi Glacier near Lake Mansarovar in Tibet, where it is known as the Yarlung Tsangpo.
Statement 2: The river takes a significant "U" turn near the Namcha Barwa mountain in Tibet and enters India through a deep gorge, marking its transition from the Yarlung Tsangpo to the Brahmaputra in India.
Both statements are accurate descriptions of the Brahmaputra River's geographical journey.

91. Option (b) is correct.
Explanation: "Not me, but you" is the motto of the National Service Scheme (NSS), which reflects the spirit of selfless service and the importance of contributing to society. The NSS is a public service program in India that encourages young students to participate in community service, develop a sense of social responsibility and enhance their leadership skills.

92. Option (b) is correct.
Explanation: "Fitness ka dose, aadha ghanta roz" is a slogan associated with the Fit India Programme, an initiative launched by the Government of India to encourage people to include physical activity and fitness in their daily lives. This campaign emphasises the importance of taking at least half an hour every day for exercise to maintain a healthy lifestyle.

93. Option (b) is correct.
Explanation: Kozhikode has been included in UNESCO's creative cities network as the 'City of Music'. This statement is incorrect. Kozhikode was designated as the 'City of Literature' in 2021.
Garba of Gujarat has been declared by UNESCO as an intangible cultural heritage. This statement is correct. Garba, a traditional dance form from Gujarat, was added to UNESCO's Representative List of Intangible Cultural Heritage in 2019.
Gwalior has been included in UNESCO's creative cities network as the 'City of Literature'. This statement is incorrect. Gwalior was designated as the 'City of Music' in 2021.
Therefore, only statement 2 is correct. So the correct option is (b): 1.

94. Option (b) is correct.
Explanation: The ASEAN-India Millet Festival 2023 was held in Indonesia. The Indian Mission to ASEAN, in collaboration with the Ministry of Agriculture and Farmers Welfare, organised this event in Jakarta from 22-26 November 2023. The festival aimed to promote millet as a sustainable and nutritious food option and to foster collaboration between India and the ASEAN countries.

95. Option (b) is correct.
Explanation: Raksha Mantri Shri Rajnath Singh inaugurated the first edition of the Indian Military Heritage Festival in New Delhi on 21 October 2023. Hence, Statement 1 is not correct.
India's first hydrogen fuel cell bus was flagged off by Union Minister of Petroleum and Natural Gas Hardeep Singh Puri in Delhi on 25 September 2023. Hence, Statement 2 is not correct.
South Africa chaired the 15th BRICS summit, which took place in Johannesburg from 22-24 August, 2023. Hence, Statement 3 is correct.
Viksit Bharat Sankalp Yatra was flagged off by Prime Minister Narendra Modi on 15 November, 2023 from Khunti, Jharkhand, with multiple Information, Education and Communication (IEC) vans launched simultaneously from various locations across the country. Hence, Statement 4 is correct.

96. Option (b) is correct.
Explanation: The Government of India has approved a new centrally sponsored scheme 'ULLAS (Understanding of Lifelong Learning for All in Society)' for the period FYs 2022–2027 to cover all the aspects of Education For All (erstwhile termed as Adult Education) to align with the National Education Policy 2020 and Budget Announcements FY 2021-

2022 'To enable increased access of resources, online modules covering the entire gamut of adult education will be introduced'. Hence, Statement 1 is correct.

The primary objective of the scheme is to empower all adults aged 15 years and above, who have not had the opportunity to educate themselves and to enable them to contribute to the growth of the country. It not only allows the learners to acquire reading, writing and numeracy skills but also enriches them with an understanding of critical life skills while encouraging lifelong learning. Hence, Statement 2 is not correct.

97. Option (a) is correct.

Explanation: The North Atlantic Treaty Organisation (NATO) was established in 1949 after the signing of the North Atlantic Treaty in Washington, D.C. on 4 April 1949 Hence, Statement 1 is not correct.

Russia is not a member of NATO. Hence, Statement 2 is correct.

The NATO derives its authority from Article 51 of the United Nations Charter. This article reaffirms the right of independent states to defend themselves individually or collectively. Hence, Statement 3 is correct.

Finland is indeed the latest member of NATO, having joined the alliance in April 2023. Hence, Statement 4 is correct.

98. Option (d) is correct.

Explanation: In January 2024, India entered into a bilateral agreement to provide grant assistance to Myanmar for the construction of a 20-foot Bailey bridge. This agreement is part of India's efforts to strengthen its relationship with Myanmar and contribute to infrastructure development in the region.

99. Option (d) is correct.

Explanation: 'Varuna', is a joint naval exercise conducted between India and France, not the USA. The other exercises listed:

Yudh Abhyas: A joint military exercise between India and the USA

Vajra Prahar: A joint special forces exercise between India and the USA

Malabar: A multilateral naval exercise primarily involving India, the USA and Japan (and occasionally Australia)

Therefore, Varuna is not an exercise between India and the USA.

100. Option (b) is correct.

Explanation: India ranks 38 out of 139 countries on the World Bank's Logistics Performance Index Report 2023; India's rank has improved by 16 places from 54 in 2014. Hence, Statement 1 is not correct.

The Global Maritime India Summit 2023 (GMIS 2023) was held at the MMRDA Grounds in Bandra Kurla Complex, Mumbai from 17-19 October, 2023. Hence, Statement 2 is not correct.

Maritime Amrit Kaal Vision 2047 was launched during the Global Maritime India Summit 2023. Hence, Statement 3 is correct.