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18 Feb, 2024



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T.B.C. : SBVP-A-GKS

Test Booklet Series

Serial

1015073



TEST BOOKLET

Paper I

(GENERAL STUDIES)

Time Allowed : Two Hours

Maximum Marks : 300

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET **DOES NOT** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. Please note that it is the candidate's responsibility to encode and fill in the Roll Number and Test Booklet Series Code A, B, C or D carefully and without any omission or discrepancy at the appropriate places in the OMR Answer Sheet. Any omission/discrepancy will render the Answer Sheet liable for rejection.
3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside.
DO NOT write **anything else** on the Test Booklet.
4. This Test Booklet contains **120** 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.
5. You have to mark all your responses **ONLY** on the separate Answer Sheet provided. See directions in the Answer Sheet.
6. All items carry equal marks.
7. Before you proceed to mark in the Answer Sheet the response to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per instructions sent to you with your Admission Certificate.
8. After you have completed filling in all your responses on the Answer Sheet and the examination has concluded, you should hand over to the Invigilator **only the Answer Sheet**. You are permitted to take away with you the Test Booklet.
9. Sheets for rough work are appended in the Test Booklet at the end.
10. **Penalty for wrong answers :**
THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY A CANDIDATE.
 - (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.

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1. Which one of the following sources contains tartaric acid ?
- Lemon juice
 - Orange juice
 - Tamarind paste
 - Vinegar
2. Which one among the following statements regarding acids and bases is **not** correct ?
- A conjugate base of a strong acid is a weak base.
 - In aqueous solution, the hydroxide ion is hydrated to give several ionic species like H_3O_2^- , H_5O_3^- and H_7O_4^- etc.
 - AlCl_3 is an electron deficient compound, and can act as a Lewis base.
 - Fluoride ion acts as a Lewis base as it can donate any one of its four electron lone pairs.
3. Which one of the following experiments explains the wave nature of electromagnetic radiation ?
- Black-body radiation
 - Photoelectric effect
 - Rutherford's scattering experiment
 - Diffraction of light
4. Which one among the following is the correct ground state electronic configuration of Cr atom ?
- $1s^2 2s^2 2p^6 3s^2 3p^6 3d^4 4s^2$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^1$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6 4s^0$
 - $1s^2 2s^2 2p^6 3s^2 3p^6 3d^3 4s^2$
5. Who among the following scientists developed the Modern Periodic Table ?
- Henry Moseley
 - Dmitri Ivanovich Mendeleev
 - John Alexander Newlands
 - Johann Döbereiner
6. Which one of the following blocks of elements is called 'Representative elements' ?
- s-block elements only
 - f-block elements only
 - d-block elements only
 - p-block elements together with s-block elements
7. Which of the following statements regarding Mount Kilimanjaro in Africa is/are correct ?
- It is situated on the Equator.
 - It is the highest free standing mountain in the world.
- Select the answer using the code given below :
- 1 only
 - 2 only
 - Both 1 and 2
 - Neither 1 nor 2
8. Aral Sea in Central Asia is situated along which of the following two countries ?
- Kazakhstan and Kyrgyzstan
 - Kazakhstan and Uzbekistan
 - Uzbekistan and Turkmenistan
 - Uzbekistan and Kyrgyzstan

9. Which of the following statements regarding Galápagos Islands in the Pacific Ocean is/are correct ?

1. They are formed due to volcanic activity.
2. They are part of the South American nation Peru.

Select the answer using the code given below :

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

10. The ancient city of Taxila is situated in which one among the following provinces of Pakistan ?

- (a) Baluchistan
- (b) Khyber Pakhtunkhwa
- (c) Punjab
- (d) Sindh

11. The Prime Meridian (zero degree longitude) does **not** pass through which of the following country/countries ?

1. England
2. France
3. Portugal
4. Scotland

Select the correct answer using the code given below :

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

12. Which one of the following processes describes the movement of particles or molecules from a region of higher concentration to a region of lower concentration ?

- (a) Diffusion
- (b) Osmosis
- (c) Plasmolysis
- (d) Deplasmolysis

13. Which among the following correctly shows the pathway of water movement in a root ?

- (a) Pericycle → Endodermis → Cortex → Epidermis
- (b) Epidermis → Pericycle → Endodermis → Cortex
- (c) Epidermis → Endodermis → Cortex → Pericycle
- (d) Epidermis → Cortex → Endodermis → Pericycle

14. After few days of sowing of maize seeds in the soil, irrespective of their position, the radicle always grows downwards, whereas the coleoptile always grows upwards. This phenomenon is known as :

- (a) Phototropism
- (b) Hydrotropism
- (c) Chemotropism
- (d) Geotropism

15. Which one of the following is the technique of joining parts of two plants to form a composite plant ?

- (a) Layering
- (b) Grafting
- (c) Cutting
- (d) Budding

16. Which one of the following statements is/are correct for a vascular bundle in which xylem and phloem are jointly situated along the same radius ?

1. These are called conjoint vascular bundles.
2. Cambium may be present in such vascular bundles.
3. Conjoint vascular bundles are always of closed type.

Select the answer using the code given below :

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

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

<i>List I</i> (Book)	<i>List II</i> (Author)
P. Eighteen Fifty-seven	1. S.N. Sen
Q. Civil Rebellion in the Indian Mutinies (1857 - 1859)	2. R.C. Majumdar
R. The Sepoy Mutiny and the Revolt of 1857	3. S.B. Chaudhuri
S. Awadh in Revolt, 1857 - 1858	4. Rudrangshu Mukherjee

Code :

	P	Q	R	S
(a)	1	2	3	4
(b)	4	3	2	1
(c)	4	2	3	1
(d)	1	3	2	4

18. Which among the following statements about Vijayanagara are correct ?

1. Colin Mackenzie was the first Surveyor General of India to visit Vijayanagara.
2. John Marshall was the first to take detailed photographs of the site.
3. James Burgess was the first to undertake conservation of Hampi.

Select the answer using the code given below :

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

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

<i>List I</i> (Traveller)	<i>List II</i> (Country)
P. Seydi Ali Reis	1. Morocco
Q. Ibn Battuta	2. Turkey
R. Peter Mundy	3. Portugal
S. Duarte Barbosa	4. England

Code :

	P	Q	R	S
(a)	2	1	4	3
(b)	3	4	1	2
(c)	3	1	4	2
(d)	2	4	1	3

20. Consider the following statements about Chlorofluorocarbons (CFCs) :

1. CFCs remain inert in the troposphere but slowly diffuse into the stratosphere.
2. CFCs in the upper atmosphere are subjected to UV radiations, generating free radical chlorine that immediately reacts with O_3 to form a radical called chlorine monoxide (ClO).
3. Each ClO can initiate a series of chemical reactions, leading to the destruction of the ozone layer.

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

- (a) 1
- (b) 2
- (c) 3
- (d) None

21. Nitrogen cycle is one of the most important microorganisms-mediated chemical reactions in aquatic and soil environments. In this context consider the following statements :

1. Nitrogen fixation is the process of oxidising NH_3 to NO_3^- .
2. Nitrification process causes reduction of NO_3^- and NO_2^- , to NO_2^- , followed by recycling of N_2 to the atmosphere.
3. Denitrification converts molecular N_2 into a fixed form as an organic nitrogen.

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

- (a) 1
- (b) 2
- (c) 3
- (d) None

22. Consider the following statements about different biomes :

1. Tropical Savanna Biome is a tropical grassland with scattered drought-resistant trees.
2. Temperate Deciduous Forest Biome is a high altitude region in the Himalayas.
3. Temperate Coniferous Forest Biome is found in very dry environment where temperature ranges from very cold to very hot.
4. Tundra Biome is found in polar regions and characterised by the absence of trees, dwarf plants and wet, spongy, and rough upper ground surface.

Which of the statements given above are correct ?

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

23. Nucleus $^{240}_{92}U$, which has a binding energy per nucleon as 7.6 MeV, disintegrates into two nuclei of $^{119}_{50}Sn$. Take $^{119}_{50}Sn$ elements atomic mass number as 120 and binding energy per nucleon as 8.4 MeV. Which one among the following is the correct value of the energy released in the disintegration process ?

- (a) 192 MeV
- (b) 190 MeV
- (c) 188 MeV
- (d) 3840 MeV

24. A frictionless pulley has a rope of negligible mass passing over it. Blocks of mass 15 kg and 5 kg are attached at the two ends of the rope and held stationary. When the masses are released to move freely, their speed in m s^{-1} , after the rope has slipped by 0.25 m over the pulley, is closest to : (take $g = 10.0 \text{ m s}^{-2}$)
- 5.0
 - 2.2
 - 1.6
 - 1.2
25. An electromagnetic wave $\vec{E} = \vec{E}_0 e^{i[k_0(3x+4y)-\omega t]}$ travelling in air is incident on the $x - z$ plane of a glass slab. The glass slab has a refractive index of 1.5. Which one among the following is the correct direction of propagation of the transmitted electromagnetic wave ?
- $0.4 \hat{i} + 0.2 \sqrt{21} \hat{j}$
 - $0.4 \hat{i} - 0.2 \sqrt{21} \hat{j}$
 - $0.4 \hat{i} + \sqrt{21} \hat{j}$
 - $0.4 \hat{i} - \sqrt{21} \hat{j}$
26. Two dielectric media D1 and D2 have dielectric constants 3 and 2, respectively. They are separated by $x - z$ plane. A uniform electric field $\vec{E} = 3 \hat{i} + 2 \hat{j}$ exists in D1. Which one among the following is the correct electric field in D2 at the xz plane ?
- $\vec{E} = 2 \hat{j}$
 - $\vec{E} = 3 \hat{i} + 3 \hat{j}$
 - $\vec{E} = 3 \hat{i} - 2 \hat{j}$
 - $\vec{E} = 2 \hat{i} + 3 \hat{j}$
27. At a given point in space, the electric field associated with an electromagnetic wave is given by $\vec{E} = (2 \hat{i} - 1.5 \hat{j}) e^{i[k_0(3x+4y)-\omega t]}$. At the same point, which one among the following is the correct value of the unit vector (\hat{B}) of the magnetic field associated with this electromagnetic wave ?
- $-\hat{k}$
 - $1.5 \hat{i} + 2 \hat{j}$
 - $1.5 \hat{i} - 2 \hat{j}$
 - $3 \hat{i} - 4 \hat{j}$
28. As per the Constitution of India, which one among the following statements is correct ?
- The Comptroller and Auditor General of India (CAG) is appointed by the President of India and remains in office during the pleasure of the President of India.
 - Administrative expenses of the office of the CAG are charged upon the Contingency Fund of India.
 - The reports of the CAG relating to the accounts of the Union and States are submitted to the President of India.
 - The President of India shall cause the reports of the CAG relating to the accounts of the Union to be laid before each House of Parliament.

29. Which of the following statements is/are correct as per the Constitution of India ?

1. The Parliament of India has the power to make provisions with respect to delimitation of constituencies.
2. The validity of a law made by the Parliament of India with respect to delimitation of constituencies shall not be called in question in a court.

Select the answer using the code given below :

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

30. Consider the following statements :

1. A special provision was made in the Constitution of India by the Constitution (Eighty-ninth Amendment) Act, 2003 to establish the National Commission for Scheduled Tribes.
2. National Commission for Backward Classes, National Commission for Minorities and National Commission for Scheduled Castes are constitutional bodies.
3. National Commission for Women is not a constitutional body.

Which of the statements given above is/are **not** correct ?

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

31. Which one among the following is the correct arrangement in increasing order of ionic radii of O^{2-} , F^- , Na^+ , Mg^{2+} ?

- (a) $Mg^{2+} < Na^+ < F^- < O^{2-}$
- (b) $O^{2-} < F^- < Na^+ < Mg^{2+}$
- (c) $Mg^{2+} < Na^+ < O^{2-} < F^-$
- (d) $O^{2-} < F^- < Mg^{2+} < Na^+$

32. Which one among the following elements has the most negative electron gain enthalpy ?

- (a) F
- (b) Cl
- (c) P
- (d) S

33. Which one among the following is the correct arrangement of molecules in increasing order of their dipole moment ?

- (a) $NF_3 < NH_3 < BF_3$
- (b) $BF_3 < NH_3 < NF_3$
- (c) $BF_3 < NF_3 < NH_3$
- (d) $NF_3 < BF_3 < NH_3$

34. Which one of the following represents the correct combination of shape and hybridisation of PF_5 ?

- (a) Square pyramidal, dsp^3
- (b) Trigonal bipyramidal, dsp^3
- (c) Square pyramidal, sp^3d
- (d) Trigonal bipyramidal, sp^3d

35. Which one of the following conditions is *not* correct for the combination of atomic orbitals to form molecular orbitals ?
- The combining atomic orbitals must have same or nearly the same energy.
 - The combining atomic orbitals must show lateral overlap with each other.
 - The combining atomic orbitals must have the same symmetry about the molecular axis.
 - The combining atomic orbitals must overlap to the maximum extent.
36. What is the colour of anhydrous CuSO_4 ?
- White
 - Blue
 - Green
 - Yellow
37. Which one of the following is the IUPAC name of $[\text{Ag}(\text{NH}_3)_2][\text{Ag}(\text{CN})_2]$?
- Diammine dicyanidosilver(I)
 - Diammine dicyanidodiargentate(I)
 - Diamminesilver(I) dicyanidoargentate(I)
 - Dicyanidoargentate(I) diamminesilver(I)
38. Which one of the following types of isomerisms is shown by $[\text{CoCl}_2(\text{en})_2]\text{Cl}$?
- Optical isomerism only
 - Geometrical isomerism only
 - Both ionisation and geometrical isomerisms
 - Both geometrical and optical isomerisms
39. Which one of the following Ni(II) complexes is diamagnetic and has tetrahedral geometry ?
- $[\text{NiCl}_4]^{2-}$
 - $[\text{Ni}(\text{CO})_4]$
 - $[\text{Ni}(\text{NH}_3)_4]^{2+}$
 - $[\text{Ni}(\text{CN})_4]^{2-}$
40. Which one among the following islands in South-East Asia is situated between Wallace's Line and Weber's Line that are related to Bio-diversity ?
- Borneo
 - Celebes (Sulawesi)
 - Java
 - New Guinea

41. Which of the following statements regarding Tropical Deciduous forests in India is/are correct ?

1. They are the most widespread forests in India.
2. They spread over regions which receive annual rainfall between 70 – 200 cm.

Select the answer using the code given below :

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

42. Which of the following statements regarding groundnut cultivation in India is/are correct ?

1. Groundnut is a Rabi crop.
2. Gujarat is an important state for Groundnut cultivation.

Select the answer using the code given below :

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

43. Which two of the following states are the leading producers of Bauxite in India as per the Annual Report of the Ministry of Mines 2022 – 23 ?

1. Odisha
2. Chhattisgarh
3. Jharkhand
4. Gujarat

Select the answer using the code given below :

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

44. As per the India State of Forest Report 2021, which of the following states has maximum percentage of its geographical area under forest cover ?

- (a) Madhya Pradesh
- (b) Manipur
- (c) Meghalaya
- (d) Mizoram

45. Many fruits burst with a sudden jerk because of which the seeds are scattered a few yards from the parent plant. This type of dispersal of seeds is known as :

- (a) Anemochory
- (b) Hydrochory
- (c) Autochory
- (d) Zoochory

46. Which one among the following diseases is characteristically and specifically linked to asbestosis ?
- Liver fibrosis
 - Lung fibrosis
 - Mesothelioma
 - Pleural effusion
47. Which one among the following diseases does **not** yet have any effective vaccine ?
- Chicken pox
 - Typhoid
 - Viral Hepatitis C
 - Human Papilloma virus
48. Which one among the following is living and non-nucleated at maturity ?
- Sieve tubes
 - Companion cells
 - Collenchyma
 - Parenchyma
49. Which one of the following examples of genetic-disorder or disease is due to the numerical abnormalities in the sex chromosome ?
- Turner's syndrome
 - Down's syndrome
 - Haemophilia
 - Alkaptonuria
50. The two medieval period canals originating from the Sutlej and Yamuna rivers and joining at Karnal were made at the orders of :
- Alauddin Khalji
 - Mohammad Tughlaq
 - Firuz Tughlaq
 - Ibrahim Lodi
51. Who among the following has written three works on the science of music called *Sangitaraja*, *Sangita Mimansa* and *Sudha Prabandha* ?
- Tansen
 - Ibrahim Adil Shah
 - Amir Khusro
 - Maharana Kumbha of Mewar
52. Which one among the following temples, constructed by Queen Loka Mahadevi in Pattadakal, is a UNESCO World Heritage site ?
- Kailasanatha Temple
 - Virupaksha Temple
 - Brihadishvara Temple
 - Srirangam Temple
53. Which among the following statements is/are correct ?
- Nalayira Divyaprabandham is an anthology of Alvar saints' compositions.
 - Tevaram is the collection of Tamil Shaiva hymns.
 - Nalayira Divyaprabandham is also described as the Tamil Veda.
- Select the answer using the code given below :
- 1 and 2 only
 - 2 and 3 only
 - 1, 2 and 3
 - 1 only

54. Who among the following is the writer of the *Kirtana-Ghosha* ?

- (a) Vatsadasa
- (b) Madhavdev
- (c) Rama Saraswati
- (d) Srimanta Sankaradev

55. Which one of the following propositions from the book 'History of British India' by James Mill is correct ?

- (a) The tax payable by the zamindars should not be more than thirty percent of the total produce
- (b) The rights of cultivators should be protected by the State
- (c) The State should remain as the landlord and that each peasant should hold land directly from the State as its tenant
- (d) Sufficient advances should be given to the peasants so that they are encouraged to cultivate cash crops

56. In April 1908, Prafulla Chaki and Khudiram Bose threw a bomb at a carriage in Muzaffarpur which they believed to be occupied by Kingsford. Which among the following correctly describes the profession of Kingsford ?

- (a) Revenue Officer
- (b) Judge
- (c) Police Officer
- (d) Army Personnel

57. Which of the following statements about Photochemical Smog is/are correct ?

1. It irritates the eyes.
2. It leads to cracking of rubber.
3. It causes considerable damage to plant life.

Select the answer using the code given below :

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

58. Which one among the following trace elements is **not** highly toxic ?

- (a) Arsenic
- (b) Chromium
- (c) Copper
- (d) Mercury

59. Consider the following combinations of lapse rate in relation to atmospheric region :

1. Troposphere : Negative lapse rate
2. Stratosphere : Negative lapse rate
3. Mesosphere : Negative lapse rate
4. Thermosphere : Positive lapse rate

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

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

60. In which sphere of the atmosphere is harmful ultraviolet (UV) radiation from the Sun absorbed ?

- (a) Mesosphere
- (b) Thermosphere
- (c) Troposphere
- (d) Stratosphere

61. Which of the following is a true fish ?

- (a) Jellyfish
- (b) Silverfish
- (c) Starfish
- (d) Sea horse

62. Which one of the following sequences of electromagnetic spectrum is correct in terms of ascending wavelength order ?

- (a) X-rays – Gamma rays – UV – Infrared – Visible – Microwaves – Radio and TV waves
- (b) Gamma rays – X-rays – UV – Infrared – Visible – Microwaves – Radio and TV waves
- (c) Gamma rays – X-rays – UV – Visible – Infrared – Microwaves – Radio and TV waves
- (d) UV – Gamma rays – X-rays – Visible – Infrared – Microwaves – Radio and TV waves

63. Which one of the following pairs of principal chemical constituents in water and their source is correct ?

- (a) Ca : Amphiboles, Feldspars, Gypsum
- (b) NO_3 : Apatite, Fluorite, Mica
- (c) CO_3 : Feldspars, Clay minerals
- (d) F : Dolomite, Gypsum, Anhydrite

64. Which one among the following group of organisms produces their own food ?

- (a) Autotrophs
- (b) Herbivores
- (c) Carnivores
- (d) Decomposers

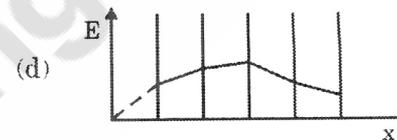
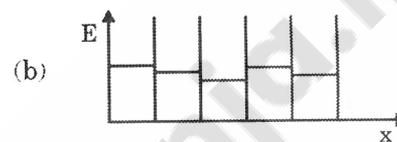
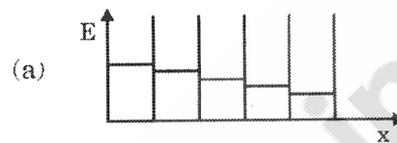
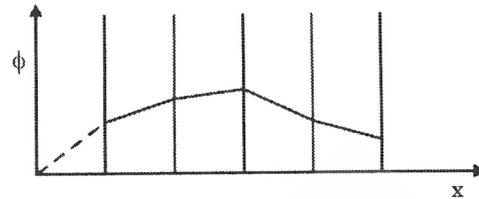
65. Which one of the following is the appropriate sequential order of ecological succession ?

- (a) Invasion – Nudation – Competition and coaction – Reaction – Stabilization
- (b) Nudation – Invasion – Competition and coaction – Reaction – Stabilization
- (c) Nudation – Invasion – Reaction – Competition and coaction – Stabilization
- (d) Invasion – Nudation – Reaction – Competition and coaction – Stabilization

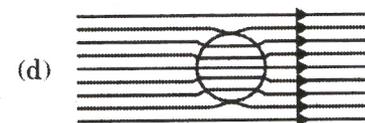
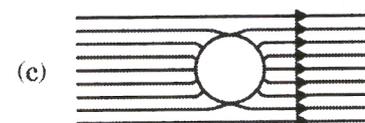
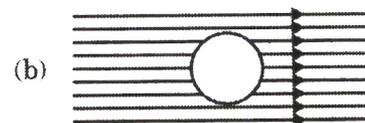
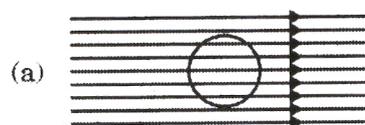
66. The Chipko Movement was initiated under the leadership of Sunderlal Bahuguna around the year :

- (a) 1951
- (b) 1971
- (c) 1981
- (d) 1991

67. In a region, the electric potential varies as shown in the figure. Which one among the following is the correct representation of the magnitude of the associated electric field ?



68. Which one among the following is the correct representation of the electric field when a conducting spherical shell is placed between the plates of a parallel plate capacitor ?



69. A cup of tea is placed at a table, and the room temperature is 35°C . The tea cools from 90°C to 70°C in 5 minutes. Which one among the following is the correct time taken for the tea to cool from 70°C to 50°C ?
- 5 minutes
 - 7 minutes
 - 9 minutes
 - 11 minutes
70. An ice bullet of temperature -10°C is fired upon an object. The bullet spends 20% of its kinetic energy in penetrating into the object and remaining kinetic energy is spent into melting the bullet at 0°C . The latent heat of fusion of ice is $3.4 \times 10^5 \text{ J kg}^{-1}$ and its specific heat capacity is $2000 \text{ J kg}^{-1} \text{ K}^{-1}$. Which one among the following is the correct initial speed of the bullet ?
- $300\sqrt{10} \text{ m s}^{-1}$
 - 3600 m s^{-1}
 - $300\sqrt{5} \text{ m s}^{-1}$
 - 900 m s^{-1}
71. Molar heat capacity at constant pressure of a diatomic gas is $3.5 R$, where R is universal gas constant. The gas is heated by providing energy of 1400 J and is allowed to expand isobarically. Which one among the following represents the work done by the gas in this process ?
- 400 J
 - 4900 J
 - 560 J
 - 280 J
72. The eyepiece of a telescope is a system of two biconvex lenses L_1 and L_2 , of focal length 30 cm and 20 cm respectively, with a separation of 2 cm between them. Lens L_2 faces the eye. This eyepiece is to be replaced by a single bi-convex lens L . Which one among the following is the correct combination of the focal length (F in cm) of the lens L and its distance from the position of lens L_1 (δ in cm) ?
- $F = 12.5$ and $\delta = 1.17$
 - $F = 12.5$ and $\delta = 1.15$
 - $F = 11.5$ and $\delta = 1.17$
 - $F = 11.5$ and $\delta = 1.15$
73. Consider the following statements :
- The President of India may specify a 'race' to be treated under the Scheduled Caste category for all purposes under the Constitution of India.
 - The President of India may specify a 'tribe' to be treated under the Scheduled Caste category for all purposes under the Constitution of India.
 - Parliament by law can include a caste or tribe in the list of Scheduled Castes.
- How many of the above statements is/are correct ?
- 1
 - 2
 - 3
 - None

74. Which one among the following statements is *not* correct as per the Constitution of India ?

- (a) National Commission for Minorities appoints a Special Officer for linguistic minorities.
- (b) It shall be the duty of the Union to develop the Hindi language as a medium of expression for all the elements of the composite culture of India.
- (c) The word 'Hindustani' is mentioned in the Constitution with reference to the enrichment of the Hindi language.
- (d) Every state shall endeavour to provide adequate facilities for instruction in the mother-tongue at the primary stage of education to children belonging to minority groups.

75. Given below are four legal terms/maxims. Which one of them means 'no man (person) shall be condemned unheard' ?

- (a) *Autrefois convict*
- (b) *Non bis in idem*
- (c) *Habeas Corpus*
- (d) *Audi Alteram Partem*

76. Which of the following statements as per the Third Schedule of the Constitution of India is/are correct ?

- 1. A Member of Parliament is free to take the oath or affirmation by 'swearing in the name of God'.
- 2. Judge of the Supreme Court has to take the oath or affirmation by 'swearing in the name of the Constitution of India'.

Select the answer using the code given below :

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

77. Which of the following pairs of Forest Research Centres and their locations are correctly matched ?

- 1. Forest Research Centre for Eco-Rehabilitation : Prayagraj
- 2. Forest Research Centre for Livelihood Extension : Shillong
- 3. Forest Research Centre for Skill Development : Bhopal
- 4. Forest Research Centre for Coastal Ecosystems : Visakhapatnam

Select the answer using the code given below :

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

78. Which of the following is **not** an important centre of silk textile industry in India ?

- (a) Baramulla
- (b) Bankura
- (c) Kolar
- (d) Jamnagar

79. Which of the following pairs is/are **not** correctly matched ?

(Ramsar site)	(State)
1. Kolleru lake	Telangana
2. Satkosia gorge	Odisha
3. Kanjli lake	Punjab
4. Pala wetland	Mizoram

Select the answer using the code given below :

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

80. Which of the following tiger reserves is/are **not** situated in the state of Rajasthan ?

- 1. Mukundra Hills
- 2. Ramgarh Vishdhari
- 3. Kawal
- 4. Bhadra

Select the correct answer using the code given below :

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

81. Which of the following statements regarding Urban Population in India as per Census 2011 is/are correct ?

- 1. More than 31% of the total population lives in towns.
- 2. The number of towns was more than 7500.

Select the answer using the code given below:

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

82. Which one among the following is **not in-situ** conservation ?

- (a) Wildlife sanctuary
- (b) Botanical garden
- (c) Biosphere reserve
- (d) National park

83. Mangroves represent :

- (a) Epiphytic vegetation
- (b) Salt-tolerant vegetation
- (c) Floodplain vegetation
- (d) Playa vegetation

84. Which one of the following types of coral reefs are developed along the edges of continental shelves and separated by lagoon ?

- (a) Patch reefs
- (b) Fringing reefs
- (c) Barrier reefs
- (d) Atoll reefs

85. Which one of the following is the correct sequence of a typical soil profile from top to bottom ?

- (a) Topsoil, Humus, Eluviation zone, Subsoil, Weathered parent material
- (b) Subsoil, Topsoil, Humus, Weathered parent material, Eluviation zone
- (c) Humus, Subsoil, Topsoil, Eluviation zone, Weathered parent material
- (d) Humus, Topsoil, Eluviation zone, Subsoil, Weathered parent material

86. Fold Mountains are formed in which type of tectonic settings ?

- (a) Divergent
- (b) Convergent
- (c) Transform
- (d) Rifting

87. Which one of the following is the thinnest layer of the Earth ?

- (a) Inner Core
- (b) Outer Core
- (c) Mantle
- (d) Crust

88. A planar, irregular shaped object has a mass of 2 kg. Its moment of inertia along the two orthogonal axes in the plane of the object are 3 kg m^2 and 4 kg m^2 , respectively. The moment of inertia of the object along an axis perpendicular to the plane and passing through a point 0.5 m away from its centre of mass is represented by I . Which one among the following is the correct value of I ?

- (a) 7.5 kg m^2
- (b) 7 kg m^2
- (c) 5 kg m^2
- (d) 1 kg m^2

89. A ball of mass 100 g falls freely from a height of $h = 20 \text{ m}$ and hits the ground at a speed of $1.4 \sqrt{gh}$. Take $g = 10 \text{ m s}^{-2}$. Which one among the following is the correct value of the work done on the ball by air friction ?

- (a) 0.4 J
- (b) 0.5 J
- (c) 0.3 J
- (d) 1 J

90. A particle moves in a circle of radius 4 m. Its linear speed is given by $4\sqrt{3}t$, where t is the time measured in seconds. At $t = 1 \text{ s}$, the angle made by the resultant acceleration $-\hat{r}$ with direction $(+\hat{r})$ is the radial direction) is given by ϕ . Which one among the following is the correct value of ϕ ?

- (a) $\tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$
- (b) $\tan^{-1}\left(\frac{1}{\sqrt{2}}\right)$
- (c) $\tan^{-1}\left(\frac{2}{\sqrt{3}}\right)$
- (d) $\tan^{-1}(\sqrt{3})$

91. Consider metallic spheres of different radii r , all at the same electrostatic potential. Then the magnitude E of the electric field just outside these spheres depends on r as :

- (a) $E \propto r^{-2}$
- (b) $E \propto r^{-1}$
- (c) $E \propto r^0$
- (d) $E \propto r$

92. Magnetic dipole moment of a square current loop of side 1 cm and carrying a current of 0.10 A is :

- (a) $3.14 \times 10^{-5} \text{ A m}^2$
- (b) $1.00 \times 10^{-5} \text{ A m}^2$
- (c) $6.28 \times 10^{-3} \text{ A m}^2$
- (d) $4.00 \times 10^{-3} \text{ A m}^2$

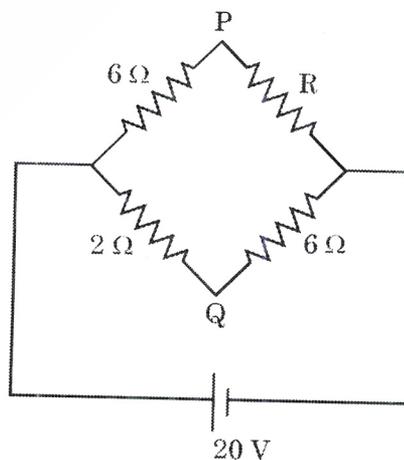
93. Ions in a solution are subject to a uniform electric field. If each ion carries charge q and has radius R , then the ionic current I due to the applied field will depend on q and R as :

- (a) $I \propto qR^2$
- (b) $I \propto q^2R$
- (c) $I \propto qR^0$
- (d) $I \propto q^2R^{-1}$

94. 100 grams of ice at 0°C is put in 240 grams of water at 5°C . The mixture finally comes to equilibrium at 0°C with m grams of ice having melted in the process. Value of m is close to : (latent heat of ice = $3.33 \times 10^5 \text{ J/kg}$ and specific heat of water = $4.2 \text{ J g}^{-1}^\circ\text{C}$)

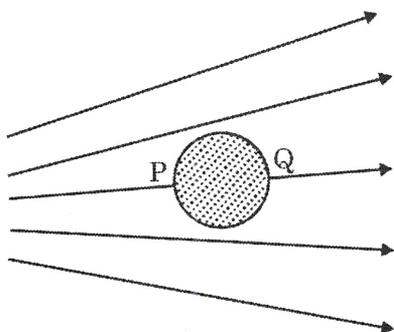
- (a) 0 g
- (b) 10 g
- (c) 5 g
- (d) 15 g

95. Shown in the circuit is a 20 V battery connected to an arrangement of four resistors. If the potential difference between points P and Q in the circuit is zero then :



- (a) $R = 2 \Omega$
- (b) $R = 8 \Omega$
- (c) $R = 18 \Omega$
- (d) $R = 4 \Omega$

96. A small metallic sphere is held in a non-uniform electrostatic field as shown in the figure. Also shown are two points P and Q on the surface of the sphere. Which one of the following statements is true for the sphere ?



- (a) Sphere does not experience a force in the field.
- (b) Surface charge density at point P is positive while at point Q is negative.
- (c) Sphere experiences a force towards the left.
- (d) Sphere experiences a force towards the right.
97. Which of the following statements is *not* correct with respect to the types of questions asked in the Lok Sabha ?
- (a) A 'Starred Question' is the one to which only a written answer is given.
- (b) A 'Short Notice Question' is the one which relates to a matter of urgent public importance.
- (c) An 'Unstarred Question' is the one to which an oral answer is not given.
- (d) No supplementary question can be asked on an 'Unstarred Question'.

98. Which of the following statements is/are *not* correct about the parliamentary practice of asking Questions in the Parliament of India ?

1. The first hour of every sitting in both the Houses of Parliament is devoted to asking questions, referred to as the 'Question Hour'.
2. Questions are generally asked by the Members of Parliament from the Ministers.
3. 'Half-an-Hour Discussions' on matters arising out of questions already answered can be held only in the Lok Sabha.
4. Questions cannot be addressed to a private member.

Select the answer using the code given below :

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

99. Consider the following statements with respect to 'Motions' in the Parliament of India :

1. A Censure Motion must specify the ground on which it is based.
2. A Censure Motion can be moved even against an individual minister.
3. A No-confidence Motion can be initiated in either House of the Parliament. However, a government will fall only if the No-confidence Motion is passed in the Lok Sabha.
4. A No-confidence Motion must specify the charges against the Council of Ministers on the basis of which the Motion is to be based.

How many of the above statements is/are correct ?

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

100. Which one among the following statements about the United Nations (UN) is **not** correct ?

- (a) All the main bodies of the United Nations, such as the General Assembly, the Security Council, the Trusteeship Council, etc. were established with the founding of the UN in 1945.
- (b) The United Nations System comprises not only the main bodies, but also many funds, programmes and specialized agencies.
- (c) Specialized agencies of the UN System are funded by both voluntary and assessed contributions.
- (d) The programmes and funds of the UN System are financed only through assessed contributions.

101. Consider the following statements with reference to a Report titled 'The Paths to Equal', published in 2023, prepared by 'UN Women' and 'UNDP' (United Nations Development Programme) :

- 1. This Report introduces two new indices : Women's Empowerment Index (WEI) and Global Gender Parity Index (GGPI).
- 2. Less than 1% of women and girls live in a country with high women's empowerment and a small gender gap.

Which of the above statements is/are correct ?

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

102. Arrange the following events in the correct chronological order :

- 1. Passage of the Anti-defection law by the Parliament of India
- 2. Mizoram was made a state
- 3. Voting age was reduced from 21 to 18
- 4. Maithili was added to the Eighth Schedule of the Constitution of India

Select the answer using the code given below :

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

103. Which of the following statements about 'Good Governance Index' (GGI) is/are **not** correct ?

- 1. The first Good Governance Index, prepared by the Department of Administrative Reforms and Public Grievances (DARPG) in partnership with the Centre for Good Governance, Hyderabad, was brought out in 2019.
- 2. The framework of assessment includes some sectors and indicators. GGI 2021 excluded 'Agriculture and Allied sectors' from the framework of assessment.
- 3. According to GGI 2021, Jharkhand is one of the few states that has performed badly.
- 4. Union Territories are not under the purview of GGI.

Select the answer using the code given below :

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

104. Which one of the following institutions is *not* in the 'World Bank Group' ?

- (a) International Centre for Settlement of Investment Disputes (ICSID)
- (b) Multilateral Investment Guarantee Agency (MIGA)
- (c) Investment Policy Framework for Sustainable Development (IPFSD)
- (d) International Finance Corporation (IFC)

105. Which one among the following is a source of non-renewable energy ?

- (a) Geothermal energy
- (b) Nuclear energy
- (c) Biomass
- (d) Hydropower

106. Biosphere Reserve Programme was initiated by :

- (a) UNEP
- (b) WWF
- (c) Greenpeace
- (d) MAB Programme of UNESCO

107. Which one among the following statements regarding Ecotone is correct ?

- (a) It represents a transitional region between two ecosystems.
- (b) It represents a region which is ecologically perfect.
- (c) It represents a region which is ecologically barren of organisms.
- (d) It represents an ecosystem containing deep marine organisms.

108. Which one among the following biogeographic zones of India covers the largest area ?

- (a) Trans-Himalayas
- (b) Desert
- (c) Semi-arid region
- (d) Himalayan region

109. Keibul Lamjao National Park is located in which one of the following wetlands ?

- (a) Chilika Lagoon of Odisha
- (b) Loktak Lake of Manipur
- (c) Deepor Beel of Assam
- (d) Gurudongmar Lake of Sikkim

110. According to IUCN Red list, a 'vulnerable' species is one which :

- (a) is likely to become endangered in the near future.
- (b) has a very high risk of getting extinct in the wild.
- (c) is known only to survive in the wild.
- (d) is known only to survive in captivity, or as a naturalized population outside its historic range.

111. Which of the following statements with respect to milk production in India is/are **not** correct ?

1. From 2013 – 14 to 2021 – 22, the milk production in India has registered an increase of more than 50 percent.
2. Although the milk production over the above period has increased, per capita availability of milk has decreased.

Select the answer using the code given below :

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

112. Which one of the following is the world governing body for Badminton recognized by the International Olympic Committee and the International Paralympic Committee ?

- (a) World Badminton League
- (b) Badminton World Federation
- (c) International Badminton Federation
- (d) International Federation of Badminton

113. Which of the following was the official song for the FIFA Women's World Cup 2023 ?

- (a) Lets Get Together Now
- (b) The Time of Our Lives
- (c) Live It Up
- (d) Do It Again

114. Arrange the following countries in the descending order of their rank in the World Happiness Report, based on a three-year average 2020 – 2022, published by the Sustainable Development Solutions Network :

1. Israel
2. United Kingdom
3. United States of America
4. Switzerland

Select the answer using the code given below :

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

115. Which one of the following is *not* correct about the UNESCO Creative Cities of Literature ?

- (a) Kozhikode is India's first UNESCO City of Literature
- (b) UNESCO launched it in 2004
- (c) Edinburgh was the first UNESCO City of Literature
- (d) There are four cities of India in this list

116. Which one among the following statements about PDMC scheme (Per Drop More Crop) is *not* correct ?

- (a) This scheme focuses on enhancing water use efficiency at farm level through micro-irrigation.
- (b) The cost borne in implementing this scheme is shared by the Central Government and the State Governments in the ratio of 50 : 50.
- (c) It is a Centrally sponsored scheme.
- (d) This scheme is implemented under *Rashtriya Krishi Vikas Yojna*.

117. Which of the following statements about 'Rehydrating the Earth' is/are correct ?

- 1. It is a global campaign for raising consciousness about the water crisis.
- 2. It is an impact-driven campaign that highlights achievements at key global events such as COP28.
- 3. It is a campaign undertaken by a philanthropic organization 'Football for Peace'.

Select the answer using the code given below :

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

118. Which of the following statements about GPAI (Global Partnership on Artificial Intelligence) is/are correct ?

- 1. It is a multi-stakeholder initiative, which aims to bridge the gap between theory and practice on AI by supporting cutting edge research.
- 2. The Annual GPAI Summit was held at New Delhi in December 2023.

Select the answer using the code given below :

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

119. Which of the following statements about the 'Blue Line' is correct ?

1. It is a learning ecosystem created by the UN System Staff College.
2. It is a line of withdrawal, set by the UN for the purpose of confirming the withdrawal of Israeli forces from the south of Lebanon.

Select the answer using the code given below :

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

120. In December 2023, the Parliament of India passed a Bill to establish 'the Sammakka Sarakka Central Tribal University' in which one among the following states ?

- (a) Telangana
- (b) Jharkhand
- (c) Chhattisgarh
- (d) Andhra Pradesh

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