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**NDA-I**

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**(GAT)**

**24 June, 2024**

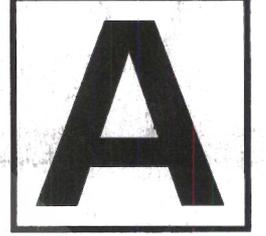


**DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO**

**T.B.C. : RRAN-A-GAT**

**Test Booklet Series**

**TEST BOOKLET  
GENERAL ABILITY TEST**



**Time Allowed : Two Hours and Thirty Minutes**

**Maximum Marks : 600**

**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 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 150 items (questions) in two parts : **PART - A** and **PART - B**. *Each item in PART - B is printed both in Hindi and English*. 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 THE 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.

**DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO**

ध्यान दें : अनुदेशों का हिन्दी रूपान्तर इस पुस्तिका के मुखपृष्ठ पर छपा है ।

**PART - A**

**Antonyms**

**Directions :** Each item in this section consists of a sentence with an underlined word followed by four words or groups of words. Select the option that is **opposite in meaning** to the underlined word and mark your response on the Answer Sheet accordingly.

1. Mohan was living in a deplorable condition.
  - (a) reprehensible
  - (b) opprobrious
  - (c) despicable
  - (d) commendable
  
2. These exercises will counteract the effects of stress and tension.
  - (a) exacerbate
  - (b) foil
  - (c) thwart
  - (d) contravene
  
3. You have to persevere with difficult students.
  - (a) give up
  - (b) persist
  - (c) carry on
  - (d) stand firm
  
4. Their new colour scheme is hideous.
  - (a) appalling
  - (b) beautiful
  - (c) grotesque
  - (d) macabre
  
5. Everywhere they go, they squander their earnings.
  - (a) fritter away
  - (b) splurge
  - (c) squabble
  - (d) manage

### Cloze

**Directions :** In this section, there is a passage having some blank spaces, each blank space is followed by four individual words or group of words. Select a word or group of words you consider the most appropriate for filling the blank space, and indicate your response on the Answer Sheet accordingly.

- The Earth's climate is \_\_\_\_\_ 6. (a) passionately changing and evolving. Some of  
(b) continually  
(c) deadly  
(d) thoughtfully
- \_\_\_\_\_ 7. (a) these changes have been due to natural causes but others can be  
(b) those  
(c) this  
(d) that
- attributed to \_\_\_\_\_ 8. (a) practical activities such as deforestation,  
(b) geological  
(c) human  
(d) animal
- emissions from industry and transport, etc., which have led to the \_\_\_\_\_ 9. (a) assimilation  
(b) absolution  
(c) collection  
(d) accumulation
- of gases and aerosols in \_\_\_\_\_ 10. (a) an atmosphere. These gases are known  
(b) a  
(c) the  
(d) no article
- as greenhouse gases because they trap heat and \_\_\_\_\_ 11. (a) raise air temperatures  
(b) hike  
(c) rise  
(d) balance
- near the ground, acting like a greenhouse on the surface of the \_\_\_\_\_ 12. (a) crust. In order  
(b) core  
(c) mantle  
(d) planet
- to create and strengthen the scientific and analytical capacity \_\_\_\_\_ 13. (a) for assessment  
(b) of  
(c) in  
(d) to
- of climate change in the country, different studies under Climate Change Action Programme  
\_\_\_\_\_ 14. (a) are developed. Many important bilateral and multilateral  
(b) are initiated  
(c) have developed  
(d) have initiated
- meetings and negotiations are held \_\_\_\_\_ 15. (a) with regular intervals  
(b) at  
(c) in  
(d) on

### Sentence Completion

**Directions :** Each of the following items features one part of a sentence, followed by four alternatives. Complete the sentence by choosing the correct alternative and mark your response on the Answer Sheet accordingly.

16. He paused
- (a) with a few moments.
  - (b) for a few moments.
  - (c) by a few moments.
  - (d) into a few moments.
17. Late at night, our car
- (a) broke down on the highway.
  - (b) broke up on the highway.
  - (c) broke into the highway.
  - (d) broke out on the highway.
18. All the countries signed the treaty
- (a) beneath Germany and France.
  - (b) except Germany and France.
  - (c) among Germany and France.
  - (d) during Germany and France.
19. I reminded her
- (a) to turn off the lights at night.
  - (b) to call off the lights at night.
  - (c) to drop off the lights at night.
  - (d) to break off the lights at night.
20. They told us about the woman
- (a) whom lived next door.
  - (b) which lived next door.
  - (c) who lived next door.
  - (d) whose lived next door.
21. I'll see you
- (a) at the end of February.
  - (b) on the end of February.
  - (c) along the end of February.
  - (d) for the end of February.
22. I dislike films
- (a) who have sad endings.
  - (b) that have sad endings.
  - (c) whose have sad endings.
  - (d) whom have sad endings.
23. The thieves denied
- (a) having stealing the money.
  - (b) stealing the money.
  - (c) had stolen the money.
  - (d) having to steal the money.
24. Did you
- (a) drop out to see Sunita on your way home ?
  - (b) drop in to see Sunita on your way home ?
  - (c) drop behind to see Sunita on your way home ?
  - (d) drop away to see Sunita on your way home ?
25. Would you like to
- (a) meeting her ?
  - (b) meet her ?
  - (c) met her ?
  - (d) meet with her ?

### Idioms and Phrases

**Directions :** Given below are some idioms/phrases followed by four alternative meanings to each. Select the most appropriate response from the options (a), (b), (c) or (d), and mark your response on the Answer Sheet accordingly.

**26.** Be bad news

- (a) feelings of hate
- (b) someone who behaves in a dishonest way
- (c) someone who is considered undesirable
- (d) to be ill

**27.** Back to the drawing board

- (a) to draw comparisons
- (b) to be a member of planning group
- (c) to start planning again because the previous plan has failed
- (d) to be fast at understanding a situation

**28.** Be in the eye of the storm

- (a) to look at something quickly
- (b) to fail miserably at a sport
- (c) to see something that you do not want to see
- (d) to be in the midst of a controversy

**29.** Life in the fast lane

- (a) to lead a selfless life
- (b) to have a happy life without complaints
- (c) life without money or comforts
- (d) an exciting and eventful lifestyle

**30.** To pass the buck

- (a) to collect money from a group of people
- (b) to shift the responsibility of something to someone
- (c) to have a short conversation with someone
- (d) to have the credentials for a particular job

### Ordering of Words in a Sentence

**Directions :** Each of the following items in this section consists of a sentence, the parts of which have been jumbled as P, Q, R and S. Rearrange the jumbled parts of the sentences into sequence and select the correct sequence as (a), (b), (c), and (d) given below and mark your response on the Answer Sheet accordingly.

31. include basic freedoms the fundamental rights are guaranteed to the individual basic rights and  
P Q R S

- (a) QSPR (b) QRSP (c) SQRP (d) RQSP

32. for many millennia been in the making of a historical process that has  
P Q R  
the Indian nation is the product  
S

- (a) SRQP (b) SQPR (c) PRSQ (d) RSQP

33. an epoch that was imbued for its people the start of with a new vision  
P Q R  
India's Independence represented  
S

- (a) SQPR (b) QRPS (c) SPQR (d) RQSP

34. science and mathematics exhibition for a discussion on the forthcoming  
P Q  
to be present before the Principal all students have been instructed  
R S

- (a) SQPR (b) RPQS (c) SRQP (d) QPRS

35. two bowlers and two batsmen respectively to the new team with the selection of another player  
P Q R  
the team now has  
S

- (a) QPRS (b) SQRP (c) RQSP (d) RPSQ

## Word Classes

**Directions :** Each of the following sentences has an underlined word. Read the sentence carefully and find which word class the underlined word belongs to. Indicate your response on the Answer Sheet accordingly.

36. You are most welcome to visit my humble abode.
- (a) Noun
  - (b) Adjective
  - (c) Adverb
  - (d) Participle
37. The situation is beyond our control.
- (a) Adjective
  - (b) Adverb
  - (c) Conjunction
  - (d) Preposition
38. I didn't tell him anything except that I needed the money.
- (a) Adjective
  - (b) Adverb
  - (c) Preposition
  - (d) Conjunction
39. He dry-cleaned my coat nicely.
- (a) Adjective
  - (b) Adverb
  - (c) Relative pronoun
  - (d) Conjunction
40. Would you like to buy this new item ?
- (a) Determiner
  - (b) Conjunction
  - (c) Interjection
  - (d) Adjective

### Passage

**Directions** Read the following passage carefully and answer the items based on it. You are required to select your answers based solely on the contents of the passage and the opinion of the author.

The grouping or assemblage of plants, animals and microbes we observe when we study a natural forest, a grassland, a pond, a coral reef or some other undisturbed area, is referred to as the area's biota or biotic community. The plant portion of the biotic community includes all vegetation, from large trees down through to microscopic algae. Likewise, the animal portion includes everything from large mammals, birds, reptiles and amphibians through to earthworms, tiny insects and mites. Microbes encompass a large array of microscopic bacteria, fungi and protozoans. Thus, the biotic community comprises a plant community, an animal community and a microbial community.

The particular kind of biotic community found in a given area is, in large part, determined by abiotic factors such as the amount of water or moisture present, the temperature, the salinity, or the type of soil in the area. These abiotic factors both support and limit the particular community. For example, a relative lack of available moisture prevents the growth of most species of plants, but supports certain species, such as cacti; these kinds of areas are deserts. Land with plenty of available moisture and a suitable temperature supports forests. The presence of water is the major factor that sustains aquatic communities.

The first step in investigating a biotic community may be simply to catalogue all the species present. Species are the different kinds of plants, animals and microbes in the community. A given species includes all those individuals which have a strong similarity in appearance to one another and which are distinct in appearance from other such groups. Each species in a biotic community is represented by a certain population — that is, by a certain number of individuals that make up the interbreeding, reproducing group.

41. Which one of the following does *not* belong to the biotic community ?
- Water
  - Human
  - Protozoa
  - Bush
42. The nature of the biotic community largely depends on :
- Biotic components
  - Abiotic components
- Select the correct answer using the code given below :
- 1 only
  - 2 only
  - Both 1 and 2
  - Neither 1 nor 2
43. Which of the following is *not* an abiotic factor ?
- Temperature
  - Humidity
  - Algae
  - Moisture
44. In the passage, the word 'aquatic community' refers to :
- Biotic community inhabiting the land
  - Biotic community found in water
  - Biotic community found in the air
  - Assemblage of rain and moisture
45. Species are defined on the basis of :
- Similarities only
  - Differences only
  - Both similarities and differences
  - None of the above

## Synonyms

**Directions :** Each item in this section consists of a sentence with an underlined word followed by four words/group of words. Select the option that is nearest in meaning to the underlined word and mark your response on the Answer Sheet accordingly.

46. The king's son was banished due to the political rivalry.

- (a) deported
- (b) called back
- (c) accepted
- (d) notified

47. He gave a dazzling performance at the opera.

- (a) brilliant
- (b) dismal
- (c) pathetic
- (d) puerile

48. She rebuffed all suggestions from her friends.

- (a) took
- (b) rejected
- (c) criticized
- (d) granted

49. He disowned his royal legacy and became a commoner.

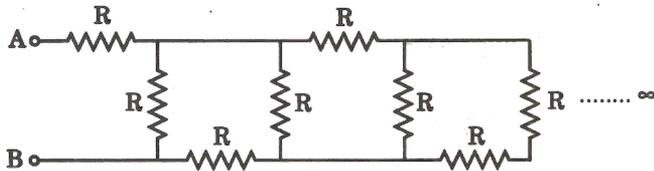
- (a) accepted
- (b) abandoned
- (c) allowed
- (d) questioned

50. The public was sceptical about the new government policy.

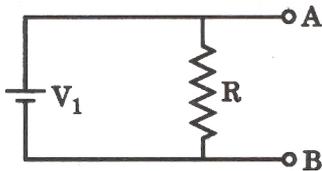
- (a) hopeful
- (b) anxious
- (c) doubtful
- (d) expectant

PART - B

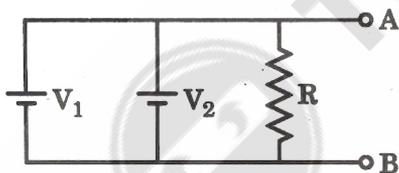
51. An infinite combination of resistors, each having resistance  $R = 4 \Omega$ , is given below. What is the net resistance between the points A and B? (Each resistance is of equal value,  $R = 4$ )



- (a)  $0 \Omega$   
 (b)  $2 + 2\sqrt{5} \Omega$   
 (c)  $2 + \sqrt{5} \Omega$   
 (d)  $\infty \Omega$
52. An electric circuit is given below.  $V_1 = 1 \text{ V}$  and Resistance  $R = 1000 \Omega$ .



The current through the resistance  $R$  is very close to  $1 \text{ mA}$  and the voltage across point A and B,  $V_{AB} = 1 \text{ V}$ . Now the circuit is changed to:



where value of  $V_2 = 5 \text{ V}$ . The internal resistances of both the batteries are  $0.1 \Omega$ . The current through the resistance  $R$  is about:

- (a)  $1.0 \text{ mA}$   
 (b)  $1.2 \text{ mA}$   
 (c)  $3.0 \text{ mA}$   
 (d)  $5.0 \text{ mA}$

53. If the current through an electrical machine running on direct current is  $15 \text{ A}$  and the machine runs for 10 minutes, the charge that passes through the machine during this time is:

- (a)  $1.50 \text{ C}$   
 (b)  $150 \text{ C}$   
 (c)  $900 \text{ C}$   
 (d)  $9000 \text{ C}$

54. Which one of the following is the best shape of a solid metal rod to form the top end of a lightning conductor?

- (a)   
 (b)   
 (c)   
 (d) 

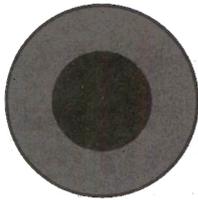
55. Which of the following forces is/are fundamental in nature ?

1. Gravitational force
2. Electromagnetic forces
3. Strong and weak nuclear forces

Select the correct answer using the code given below :

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

56. A spherical shell of outer radius  $R$  and inner radius  $R/2$  contains a solid sphere of radius  $R/2$  (see figure). The density of the material of the solid sphere is  $\rho$  and that of the shell is  $\rho/2$ . What is the average mass density of the larger sphere thus formed ?



- (a)  $3\rho/4$
- (b)  $9\rho/16$
- (c)  $7\rho/8$
- (d)  $5\rho/8$

57. The human eye is like a camera that has a lens with :

- (a) fixed focal length and fixed aperture size.
- (b) variable focal length and fixed aperture size.
- (c) fixed focal length and variable aperture size.
- (d) variable focal length and variable aperture size.

58. Under Article 371A of the Constitution of India, with respect to which of the following item(s) the Acts of the Parliament of India shall **not** apply to the State of Nagaland, unless the Legislative Assembly of the State of Nagaland by a resolution so decides ?

1. Religious or social practices of Nagas
2. Naga customary law and procedure
3. Ownership and transfer of land and its resources
4. Boundaries of Nagaland with other states

Select the answer using the code given below :

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

59. Under Article 191 of the Constitution of India, a person shall be disqualified for being chosen as, and for being, a member of the Legislative Assembly or Legislative Council of a state if the person holds any office of profit under :

1. the Government of India.
2. any State Government.

Select the correct answer using the code given below :

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

60. Consider the following UN Declarations/Covenants :

1. Universal Declaration of Human Rights
2. Convention on the Elimination of All Forms of Discrimination Against Women
3. International Covenant of Economic, Social and Cultural Rights
4. Convention on Refugees

Which one of the following is the correct chronological order (starting with the earliest) of the above ?

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

61. Which one of the following statements regarding the objectives of the Second Five-Year Plan is *not* correct ?

- (a) Development of the basic and heavy industry sector
- (b) Increase in national income to raise living standards
- (c) Expansion of the consumer goods sector
- (d) Expansion of employment opportunities

62. Consider the following statements about the emergence of urban centres in India from circa 6<sup>th</sup> Century BCE :

1. All of them developed away from the capitals of *mahajanpadas*.
2. Major towns were located along routes of communication.
3. Many were bustling centres of commercial, cultural and political activity.

How many of the above statements is/are correct ?

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

63. Consider the following statements about ancient Indian inscriptions :

1. The earliest inscriptions are in Sanskrit.
2. Kharosthi script, used in inscriptions in the north-west, was deciphered with the help of coins of Indo-Greek kings who ruled over the area.
3. Most of the inscriptions mention grand, unique events, and routine agricultural practices do not find mention.

How many of the above statements is/are correct ?

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

64. The relative atomic mass of boron (which exists in two isotopic forms  $^{10}\text{B}$  and  $^{11}\text{B}$ ) is 10.81. What will be the abundance of  $^{10}\text{B}$  and  $^{11}\text{B}$ , respectively (consider a sample of 100 atoms) ?

- (a) 19% and 81%
- (b) 81% and 19%
- (c) 38% and 62%
- (d) 62% and 38%

65. Which among the following are essential constituents of Portland cement ?

- (a) Sand, lime, clay
- (b) Silica, alumina, lime
- (c) Silica, lime, graphite powder
- (d) Sand, graphene, clay

66. Litmus, a well-known acid-base indicator, is derived from :

- (a) Fungi
- (b) Lichens
- (c) Bacteria
- (d) Termite

67. What is the oxidation state of Vanadium in  $V_2O_5$  ?

- (a) +2
- (b) +4
- (c) +3
- (d) +5

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

<i>List-I</i>	<i>List-II</i>
<i>(Allotrope of Carbon)</i>	<i>(Property)</i>
A. Graphite	1. Thinnest and strongest material
B. Diamond	2. Hardest natural substance
C. Fullerene	3. Very light and strong material
D. Graphene	4. Soft and slippery material

Code :

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

69. Consider the following statements regarding the International Date Line :

1. It is roughly  $180^\circ$  meridian, which deviates slightly East and West to avoid land areas surrounded by the Atlantic Ocean.
2. The date to the East of this line is (24 hours) earlier than to the West.

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

70. Which of the following statements regarding 'aurora' is/are correct ?

1. The solar wind upon reaching the Earth's atmosphere is directed towards two magnetic poles and a colourful display of lights is seen in the night sky.
2. The particles interact with the different gases of the atmosphere and each gas glows with a particular colour.
3. In April 2023, aurora was captured in the night sky in India by the Indian Astronomical Observatory at Hanle, Ladakh.

Select the answer using the code given below :

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

71. Which of the following statements regarding *Barchan* is/are correct ?

1. It is a crescent shaped mound of sand, which is deposited by the wind blowing constantly from one direction in a desert.
2. The windward side has a convex steep slope with maximum height at the centre.
3. Two ends of *Barchan* are called horns and point opposite to the direction the wind blows.

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

72. Which of the following statements regarding Regur soil is/are correct ?

1. It is a light coloured, clayey and fertile soil.
2. It is developed on Deccan basaltic lava under hot and humid conditions.
3. Cotton is extensively cultivated in this soil.

Select the answer using the code given below :

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

73. Which of the following statements regarding clouds is/are correct ?

1. Clouds are classified on the basis of altitude and their form.
2. According to altitude they are classified as High, Middle and Low clouds.
3. Stratus, Nimbostratus and Stratocumulus are high clouds.

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

74. Consider the following statements regarding 'fronts' :

1. The movement of a front causes a slow change in weather in the area over which it moves.
2. Cold fronts are associated with thunderstorms.
3. Warm front is the boundary between an advancing mass of warm air where it is overriding and rising above a mass of colder air.

Which of the statements given above is/are correct ?

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

75. Consider the following statements regarding soils :

1. Soils having a very high content of sodium and calcium and pH of more than 7.0 are alkaline soils.
2. Black cotton soil had developed on the Deccan basaltic lava under hot and humid conditions.
3. Laterite soils are characterised by a deep weathered layer from which silica has been leached.

Which of the statements given above is/are correct ?

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

76. Consider the following characteristics of a grassland :

1. An extensive area of mid latitude grasslands are devoid of trees and shrubs.
2. The climate is characterised by hot summers, cold winters and relatively low rainfall occurring mainly in spring and summer.
3. In humid parts, grasses grow to a meter or more in height.

On the basis of the above characteristics, select the correct grassland from the options given below :

- (a) Steppes
- (b) Prairies
- (c) Savanna
- (d) Pampas

77. Which of the following statements regarding animal cell membrane is correct ?

- (a) They are composed of phospholipids only.
- (b) They are composed of proteins only.
- (c) They are composed of phospholipids and proteins only.
- (d) They are composed of phospholipids, proteins and cholesterol (lipid).

78. Which of the following is *not* a part of compound microscope ?

- (a) Mirror
- (b) Stage
- (c) Clip
- (d) Retina

79. Which one of the following is the correct sequence in increasing complexity ?

- (a) Protein – Organism – Tissue – Organ
- (b) Protein – Organ – Tissue – Organism
- (c) Protein – Organism – Organ – Tissue
- (d) Protein – Tissue – Organ – Organism

80. Consider the following cell types :

1. Monocyte
2. Chondrocyte
3. Basophil
4. Lymphocyte

How many of the above belong to animal cell types ?

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

81. In the human digestive system, which one among the following is the role of the pancreas ?
- Secretion of surfactants to break up lipid droplets
  - Storage and regulated release of bile
  - Secretion of lipase, amylase and protease
  - Neutralizing stomach acids
82. Consider the following statements :
- DNA replication takes place when chromatin is opened up.
  - Chromatin organises itself into rod-shaped chromosomes before cell division.
  - Both prokaryotes and eukaryotes have the same process for cell division.
- Which of the statements given above is/are correct ?
- 1 only
  - 1 and 2 only
  - 1, 2 and 3
  - 3 only
83. A uniform meter scale of mass 0.24 kg is made of steel. It is kept on two wedges,  $W_1$  and  $W_2$ , in a horizontal position.  $W_1$  is at a distance of 0.2 m from one of its ends, while  $W_2$  is at distance of 0.4 m from the other end. If the force on the scale is  $N_1$  due to  $W_1$  and  $N_2$  due to  $W_2$ , then : (take  $g = 10.0 \text{ m s}^{-2}$ )
- $N_1 = 1.6 \text{ N}$  and  $N_2 = 0.8 \text{ N}$
  - $N_1 = 0.8 \text{ N}$  and  $N_2 = 1.6 \text{ N}$
  - $N_1 = 0.6 \text{ N}$  and  $N_2 = 1.8 \text{ N}$
  - $N_1 = 1.8 \text{ N}$  and  $N_2 = 0.6 \text{ N}$
84. Escape speed from the Earth is close to  $11.2 \text{ km s}^{-1}$ . On another planet whose radius is half of the Earth's radius and whose mass density is four times that of the Earth, the escape speed in  $\text{km s}^{-1}$  will be close to :
- 11.2
  - 15.8
  - 5.6
  - 7.9
85. Which one of the following does *not* apply to sound waves in fluids ?
- They transport energy
  - They need a medium to travel
  - They are transverse
  - They travel faster in liquids than in gases
86. A ball of 0.1 kg mass is dropped on a hard floor from a height of 0.45 m and rises to a height of 0.20 m. If it was in touch with the floor for 0.1 s, the net force it applied on the floor while bouncing is : (take the gravitational acceleration  $g = 10 \text{ m s}^{-2}$ )
- 1.0 N
  - 6.0 N
  - 3.0 N
  - 5.0 N

87. Which one of the following statements regarding simple pendulum is correct ?

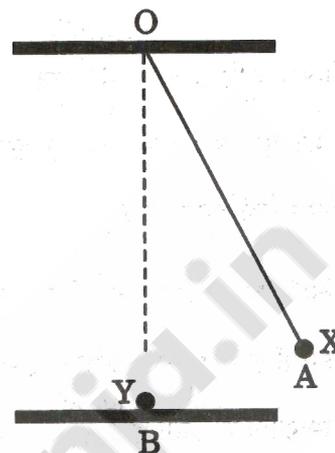
Simple pendulum has a time period independent of amplitude :

- (a) only for small amplitudes because then the net force on its bob is independent of its displacement.
- (b) for any amplitude because the net force on the bob is always proportional to its displacement.
- (c) for any amplitude because the net force on the bob is independent of its displacement.
- (d) only for small amplitudes because then the net force on its bob is proportional to its displacement.

88. Which one of the following about different frictional forces is correct ?

- (a) Kinetic friction > Static friction > Rolling friction
- (b) Static friction > Rolling friction > Kinetic friction
- (c) Static friction > Kinetic friction > Rolling friction
- (d) Static friction > Kinetic friction = Rolling friction

89. A metallic bob X of mass  $m$  is released from position A. It collides elastically with another identical bob Y placed at rest at position B on a horizontal frictionless table. The angle AOB is  $30^\circ$ .



How high does the bob X rise immediately after the collision ?

- (a) To the same height as that of position A on the other side in the same trajectory
- (b) To half the height as that of position A on the other side along the same trajectory
- (c) The same height at position A
- (d) It stops at position B

90. Consider the two statements given below :

*Statement-1* : Infrared waves are also called heat waves.

*Statement-2* : Water molecules readily absorb infrared waves.

Select the correct answer using the code given below :

- (a) Both the statements are individually true and Statement-2 is the correct explanation of Statement-1.
- (b) Both the statements are individually true, but Statement-2 is *not* the correct explanation of Statement-1.
- (c) Statement-1 is true, but Statement-2 is false.
- (d) Statement-2 is true, but Statement-1 is false.

91. Which of the following statements are correct ?

1. British 'trade surplus' with India in the nineteenth century meant that the value of British exports to India was much higher than the value of British imports from India.
2. India played a crucial role in the late-nineteenth-century world economy by helping Britain balance its deficits.
3. Britain grew opium in India and exported it to China and, therefore, for a while after the 1820s, opium became India's single largest export.
4. The nineteenth century saw export of Indian raw materials decline, and that of manufactured goods increase.

Select the answer using the code given below :

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

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

<i>List-I</i>	<i>List-II</i>
<i>(Unit in use in early India)</i>	<i>(Content)</i>
A. <i>Muhurta</i>	1. Measure of weight
B. <i>Raktika</i>	2. Measure of time
C. <i>Angula</i>	3. Metre of poetry
D. <i>Pada</i>	4. Measure of length

Code :

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

93. First coins in Indian history bearing the names and images of rulers were issued by the :

- (a) Mauryas
- (b) Pushyabhutis
- (c) Guptas
- (d) Indo-Greeks

94. Social theorists in the nineteenth and twentieth centuries emphasised the emergence of industrialisation, urbanisation, secularisation and bureaucratisation as hallmarks of :

- (a) Modernity
- (b) Feudalism
- (c) Kingship
- (d) Medievalism

95. Consider the following events :

1. Launch of Non-Cooperation Movement
2. All-India Khilafat Conference in Delhi
3. Passing of the Rowlatt Act
4. Jallianwala Bagh incident

Which one of the following is the correct chronological order of the given events (earliest to latest) ?

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

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

<i>List-I</i> (System / Category)	<i>List-II</i> (Description)
A. <i>Upari</i>	1. Peasants directly responsible for the payment of revenue
B. <i>Pattadar</i>	2. Category of tenancy tenure held under the Marathas
C. <i>Mirasidar</i>	3. Gifts of land or land revenue
D. <i>Inam lands</i>	4. Co-parcenary title holder and designated revenue payer in southern India

Code :

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

97. Which of the following statements about Vijayanagara king Krishnadevaraya's expeditions are correct ?

- In the early years of his reign he marched against the ruler of Orissa.
- In 1520 CE, he captured the fort of Raichur from Ismail Adil Khan.
- Krishnadevaraya restored Sultan Mahmud Shah to power and assumed the title of *Yavana-rajya-sthapan-acharya*.

Select the answer using the code given below :

- 1 and 3 only
- 2 and 3 only
- 1, 2 and 3
- 1 and 2 only

98. Water gas is a mixture of :

- $\text{CO}_2$  and  $\text{H}_2$
- $\text{CO}$  and  $\text{H}_2$
- $\text{CO}_2$  and  $\text{H}_2\text{O}$
- $\text{CO}$  and  $\text{H}_2\text{O}$

99. Human body works in the pH range of :

- 6.8 – 7.2
- 7.0 – 7.8
- 6.5 – 7.5
- 7.5 – 8.0

100. Which one among the following statements with reference to the properties of water is *not* correct ?

- The specific heat of water is abnormally high.
- Latent heat of fusion of water is very low.
- Density of water is higher than ice.
- Pure water is a non-conductor of electricity.

101. Which one among the following compounds has a sweet and fruity smell ?

- Ethyl alcohol
- Acetic acid
- Ethyl acetate
- Acetophenone

102. What is the coordination number of  $\text{Na}^+$  and  $\text{Cl}^-$  ions in  $\text{NaCl}$  lattice ?

- 6, 1
- 1, 6
- 6, 6
- 5, 5

103. Which one among the following is present in the nettle leaf hairs that causes burning pain ?

- (a) Methanoic acid
- (b) Ethanoic acid
- (c) Benzoic acid
- (d) Acetic acid

104. Which one among the following is known as Milk of Magnesia ?

- (a) Magnesium bicarbonate
- (b) Magnesium carbonate
- (c) Magnesium sulphate
- (d) Magnesium hydroxide

105. Soap with water forms :

- (a) Metallotropic liquid crystal
- (b) Thermotropic liquid crystal
- (c) Homogeneous solution
- (d) Lyotropic liquid crystal

106. Which among the following is the correct composition of Borax ?

- (a) Sodium, Boron, Magnesium and Hydrogen
- (b) Sodium, Boron, Oxygen and Hydrogen
- (c) Potassium, Boron, Oxygen and Hydrogen
- (d) Sodium, Boron, Nitrogen and Hydrogen

107. Which one among the following oxides has the highest melting point ?

- (a)  $\text{Na}_2\text{O}$
- (b)  $\text{MgO}$
- (c)  $\text{Fe}_2\text{O}_3$
- (d)  $\text{CuO}$

108. Which of the following statements regarding neap tides is/are correct ?

- 1. It occurs every 14 – 15 days, which coincides with the first and third quarter of the Moon.
- 2. This tide has a small tidal range because the gravitational forces of the Moon and the Sun are in quadrature.

Select the answer using the code given below :

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

109. Which of the following statements regarding earthquakes is/are correct ?

- 1. The point on the Earth's surface directly above the focus is called the epicentre of the earthquake.
- 2. Earthquakes generate Primary and Secondary waves that radiate outward from the earthquake focus.
- 3. Deep-focus earthquakes are likely to cause more damage than shallow-focus earthquakes.

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

110. Which of the following statements regarding air temperature is/are correct ?

- 1. Air temperature is measured at a standard height of 1.2 m (4.0 feet) above the ground surface.
- 2. The average rate of temperature decrease with height is termed as the environmental temperature lapse rate.

Select the answer using the code given below :

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

111. Which of the following statements regarding humidity is/are correct ?

1. It is a ratio between the actual amount of water vapour present in the atmosphere and the maximum amount it can hold at a given temperature.
2. When the relative humidity is high, more water evaporates from the skin.
3. Higher the air temperature lower the relative humidity of the air.

Select the answer using the code given below :

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

112. Which of the following statements regarding cyclones and anti-cyclones is/are correct ?

1. In the Northern Hemisphere, cyclones rotate counter clockwise and anticyclones rotate clockwise.
2. Cyclones are often associated with cloudy or rainy weather, whereas anticyclones are often associated with fair weather.
3. In the Southern Hemisphere, the cyclonic spiral will be clockwise because the Coriolis force acts to the left.

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

113. Identify the sea-port in India on the basis of the given characteristics :

1. It is more than a century old port on the west coast of India.
2. It is a natural harbour protected by a breakwater and also by a mole.
3. A deep draft channel of about 14 metres depth permits large vessels to enter the harbour.

Select the correct sea-port from the options given below :

- (a) Mormugao Port
- (b) Deendayal Port
- (c) Cochin Port
- (d) Jawaharlal Nehru Port

114. Identify the Iron and Steel Plant on the basis of the given characteristics :

1. It receives coal from Jharia and iron-ore from Sundargarh and Kendujhar.
2. Power for the electric furnaces is procured from Hirakund.
3. Water is obtained from Koel and Sankh rivers.

Select the correct Iron and Steel Plant from the options given below :

- (a) Bhilai Steel Plant
- (b) Durgapur Steel Plant
- (c) Rourkela Steel Plant
- (d) Bokaro Steel Plant

115. Which of the following statements regarding Earth's internal structure is/are correct ?

1. The oceanic crust is heavier than the continental crust.
2. Most of the Earth's internal heat is contained within the mantle.
3. Large convective cells in the crust circulate heat and drive plate-tectonic processes.

Select the answer using the code given below :

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

116. Which of the following statements regarding the given rivers is/are correct ?

1. Tsangpo crosses over into India under the name of Dihang.
2. Godavari has the second largest river basin covering about 10 percent of the area of India.
3. Rivers Chambal and Betwa are the important tributaries of river Ganga which join river Ganga directly in Uttar Pradesh.

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

117. Which of the following statements regarding the World Climate Types and their relation with Inter Tropical Convergence Zone (ITCZ) is/are correct ?

1. Tropical Wet Climate is one of the world's rainiest due to the dominance of the ITCZ over it.
2. Tropical Savanna Climate experiences a distinctive alternation of wet and dry seasons, caused chiefly by the seasonal shift in latitude of the subtropical highs and ITCZ.
3. The Tropical Monsoonal Climate experiences heavy rainfall as a consequence of the nearness of the ITCZ for much of the year.

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

118. Which of the following statements regarding tropical cyclones is/are correct ?

1. These storms develop during the summer and autumn in every tropical ocean except the South Atlantic and eastern South Pacific Oceans.
2. Tropical cyclones that occur in the North Atlantic and eastern North Pacific Oceans are known as typhoons.
3. Tropical cyclones that occur in the Indian and South Pacific Oceans are called cyclones.

Select the answer using the code given below :

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

119. Identify the land biome on the basis of the given characteristics :

1. Their climates are characterised by high rainfall and temperatures that vary from cold to mild.
2. These forests contain primarily deciduous trees – including maple, oak, hickory and beechwood.
3. Raccoons, opossums, bats and squirrels are found in the trees.

Select the correct land biome from the options given below :

- (a) Tropical forest
- (b) Temperate forest
- (c) Boreal forest
- (d) Mediterranean forest

120. Leaves of most plants appear green because the chlorophyll present in it :

- (a) absorbs red and blue light while reflecting green light.
- (b) absorbs green light only.
- (c) absorbs green light while reflecting red and blue light.
- (d) reflects red light and absorbs blue and green light.

121. In most prokaryotes, the chromosome number is :

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

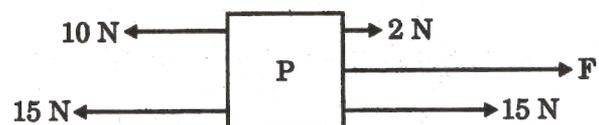
122. Bacterial DNA is referred to as naked because it is *not* associated with :

- (a) any scaffold
- (b) proteins
- (c) ribozymes
- (d) plasmid

123. Which one among the following cells produces antibodies against a foreign antigen ?

- (a) Lymphocytes
- (b) Erythrocytes
- (c) Eosinophils
- (d) Platelets

124. If the block P as shown in the figure below were to be at rest, what should the magnitude of force F be ?

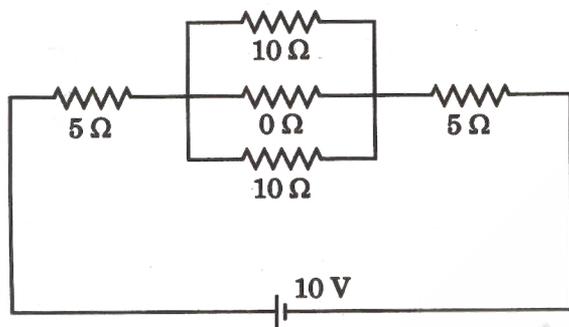


- (a) 5 N
- (b) 6 N
- (c) 8 N
- (d) 10 N

125. Of the following, which does *not* belong to a nuclear reactor ?

- (a) A turbine
- (b) A heat exchanger
- (c) A mechanism to reduce CO<sub>2</sub> emission
- (d) A reaction chamber

126. Consider the following electric circuit :



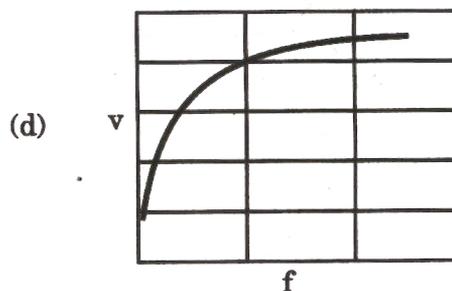
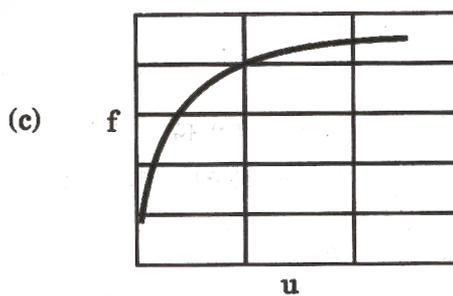
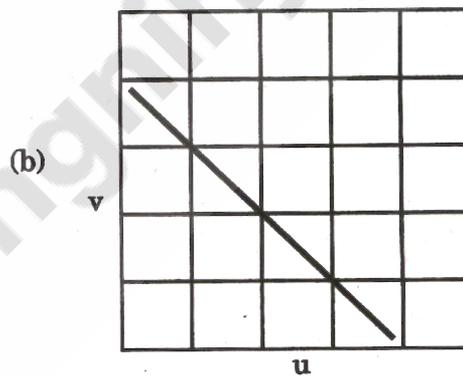
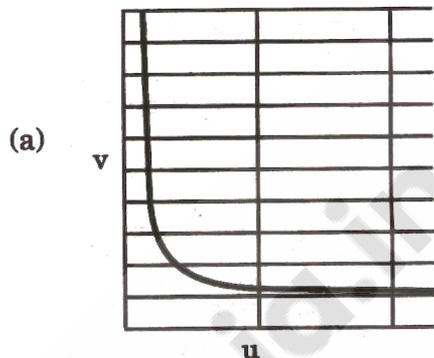
The current in the above electric circuit is :

- (a) 1 A
- (b) (10/15) A
- (c) 2 A
- (d) 1.5 A

127. A microscope may be a combination of :

- (a) two convex lenses.
- (b) a convex and a concave lens.
- (c) two concave lenses.
- (d) a convex lens and a convex mirror.

128. For a human eye, where  $u$  is the distance of an object from the eye,  $f$  is the focal length of the lens and  $v$  is the distance of image from the eye, which is the correct schematic graph ?



**129.** Which of the following statements with regard to the phenomenon of the primary rainbow formation by water droplets is/are correct ?

1. It involves refraction and one internal reflection of sunlight.
2. It involves refraction of sunlight only.
3. It is formed as the inner bow.
4. It may involve more than one internal reflection as well as refraction of sunlight.

Select the answer using the code given below :

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

**130.** Which one of the following scientists mentioned that an electron in an atom could revolve in certain stable orbits without the emission of radiant energy ?

- (a) Ernest Rutherford
- (b) J.J. Thomson
- (c) Niels Bohr
- (d) Albert Einstein

**131.** LIGO experiment confirmed one of the predictions of :

- (a) String theory
- (b) Special theory of relativity
- (c) Quantum mechanics
- (d) General theory of relativity

**132.** A block of mass 2 kg, moving with the initial speed of 3 m/s comes to rest on a rough horizontal surface after travelling a distance of 3 m. The magnitude of the frictional force is :

- (a) 9 N
- (b) 3 N
- (c) 18 N
- (d) 1 N

**133.** Which one of the following is primarily responsible for conduction of current in a metal ?

- (a) Bound electrons
- (b) Free electrons
- (c) Both bound and free electrons
- (d) Ions

134. Which of the following were features of the postal system of India as described by Ibn Battuta ?

1. The foot post carries a ringing bell in one hand.
2. The horse post is called *uluq*, stationed at a distance of every four miles.
3. The foot post or *dawa* has one station at every four *kos* of distance.
4. The foot post is quicker than horse post.

Select the correct answer using the code given below :

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

135. Which one of the following texts is a commentary written by Chakrapanidatta (11 Century CE from Bengal) on the *Sushrut Samhita* ?

- (a) *Sabdachandrika*
- (b) *Bhanumati*
- (c) *Nitiratnakara*
- (d) *Lohasarvasava*

136. Consider the following statements about the arrival of tobacco in India :

1. Tobacco plant arrived first in the Deccan.
2. Tobacco spread to northern India in the early years of the seventeenth century.

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

137. Consider the following Women's Associations and their important associates in early twentieth century India :

1. Women's Indian Association of 1917 : Margaret Cousins
2. National Council of Women in India of 1925 : Sarala Devi Chaudhurani
3. Bharat Stree Mahamandal of 1910 : Lady Meherbai Tata

Which of the above pairs is/are correctly matched ?

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

138. Consider the following statements about the issue of separate electorate during the early decades of the twentieth century in India as a means to secure adequate representation for the deprived social categories in the absence of universal adult franchise :

1. The All India Depressed Classes Association of M.C. Rajah was staunchly in favour of joint electorate.
2. The All India Depressed Classes Leaders' Conference demanded separate electorate.
3. The Communal Award in September 1932 recognised the right to separate electorate for the 'untouchables'.

Which of the statements given above are correct ?

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

139. Which of the following statements with regard to the famous 'silk routes' are correct ?

1. Silk routes refer to East-bound European silk cargoes along these routes.
2. There were several silk routes, over land and by sea, joining together vast regions of Asia with Europe and northern Africa.
3. They are known to have existed since before the Christian Era and thrived almost till the fifteenth century.
4. Besides silk, Chinese pottery, textiles and spices from India and South-east Asia travelled the same route.

Select the answer using the code given below :

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

140. Consider the following statements about Ajanta paintings :

1. The surface of the rock was coated with clay mixed with rice husk and gum and a coat of lime was applied over this.
2. The outline drawing was done first on the lime coating and colours were added subsequently.

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

141. Which of the following statements with regard to the Square Kilometer Array (SKA) project is/are correct ?

1. SKA is a state of the art, mega science international facility to build the world's biggest and most sensitive radio telescope for addressing a wide variety of cutting-edge science goals.
2. The Government of India has accorded its approval for India's participation in the international mega science project.

Select the answer using the code given below :

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

142. Exercise Desert Cyclone is a joint military exercise between India and :

- (a) Kuwait
- (b) Saudi Arabia
- (c) United Arab Emirates
- (d) Oman

143. Which of the following statements with regard to the constitution of Finance Commission is/are correct ?

1. The Government of India has recently constituted the Sixteenth Finance Commission under the Chairmanship of Dr. Arvind Panagariya.
2. Finance Commission is constituted in pursuance to Article 263 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

144. Recently the Ministry of Environment, Forest and Climate Change has submitted three nominations from India for Wetland City Accreditation (WCA) under the Ramsar Convention on Wetlands. Which one among the following cities is **not** one among them ?

- (a) Indore
- (b) Bhopal
- (c) Udaipur
- (d) Jodhpur

145. Which of the following statements is/are correct ?

1. In India, 12<sup>th</sup> March is celebrated as the National Youth Day.
2. National Youth Day is celebrated to commemorate the birth anniversary of Swami Vivekananda.

Select the answer using the code given below :

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

146. Consider the following statements about *INS Sagardhwani* :

1. It is an oceanographic research vessel of Naval Physical and Oceanographic Laboratory (NPOL) of DRDO.
2. Recently it embarked on the Sagar Maitri Mission-4 to establish long-term scientific partnerships with Indian Ocean Rim countries in Ocean Research and Development.

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

147. Who among the following is the Chairman of the Committee constituted by the Government of India to examine the issue of holding simultaneous elections in the country and to make recommendations thereon ?

- (a) Union Home Minister Shri Amit Shah
- (b) Chief Justice of India Shri Dhananjaya Yeshwant Chandrachud
- (c) Former President of India Shri Ram Nath Kovind
- (d) Chief Election Commissioner of India Shri Rajiv Kumar

148. In January 2024, India's first all-girls' Sainik School was inaugurated at :

- (a) Bhopal
- (b) Kohima
- (c) Vrindavan
- (d) Namsai

149. In February 2024, Government of India has decided to scrap the Free Movement Regime (FMR) between India and :

- (a) Myanmar
- (b) Bhutan
- (c) Bangladesh
- (d) Nepal

150. Who among the following is the author of the book *Why Bharat Matters* ?

- (a) L.K. Advani
- (b) S. Jaishankar
- (c) Mohan Bhagwat
- (d) Pranab Mukherjee

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