# INDUS RANGERS DEFENCE ACADEMY

4TH Floor Shakumbhari Complex, Chetmani Near: IP Vijaya Mall Bhelupur Varanasi, (U.P.– 221010)

**NDA [ENGLISH + GS]**
**PRACTICE SHEET – 1**

**Time: 2:30 Hr** **M. M.: 600 Marks**

**General Instructions:**

- There are 150 questions
- All questions have 4 marks for correct and –1 mark for wrong answer as a penalty.
- The name, date, and exam must be filled in OMR sheet otherwise the result will not be published.
- OMR fill should be properly.

1. Can you help me? I _____ a post office.
   A. am looking for B. look for C. am look for D. looking for
2. Tomorrow the Queen _____ open a new hospital.
   A. is going B. will going to C. is going to D. will to
3. What _____? I work in a book shop.
   A. are you doing B. do you C. are you do D. do you do
4. Where _____ yesterday?
   A. you was B. are you C. were you D. did you were
5. _____ John last week?
   A. Did you see B. Did you saw C. Do you see D. Have you see
6. Last month he _____ three large fish.
   A. catch B. catched C. caught D. did catch
7. When we went in, they _____ to the radio.
   A. listened B. listening C. were listening D. were listen
8. Do you like Paris? I don't know. I _____ there.
   A. never went B. didn't go C. never gone D. haven't been
9. I'm a teacher. I _____ a teacher for twelve years.
   A. was B. have been C. am D. am being
10. She can drive; she _____ drive for fifteen years.
    A. can B. is able to
    C. could D. has been able to
11. He's the best dancer. He dances _____ than anyone else.
    A. very beautiful B. more beautiful
    C. much more beautiful D. more beautifully
12. They don't need any help. They can do it _____ .
    A. theirself B. theirselves C. their own D. themselves
13. He _____ drink whisky, but he does now.
    A. used to B. wasn't used to
    C. hadn't use to D. didn't use to
14. It's wrong. You _____ do it.
    A. shouldn't to B. needn't C. don't have to D. shouldn't
15. When is he coming? I _____ for over an hour.
    A. am waiting B. have waited
    C. was waiting D. have been waiting

16. I'm tired _____ questions.
A. to answer B. that I answer
C. because of to answer D. of answering
17. I don't know _____ it.
A. because he did B. why did he C. why did he do D. why he did
18. We'll phone as soon as we _____ the information.
A. will have B. have C. are going to have D. are having
19. When the police arrived, the criminals _____ escaped.
A. were already B. already C. had already D. have already
20. This room _____ seven times.
A. is painted B. has painted
C. has been painted D. they have painted
21. If I _____ enough money, I'd buy a car.
A. have B. had C. will have D. would have
22. He said _____ happy to be in England again.
A. he was B. I am C. he is D. to be
23. I enjoy _____ my friends.
A. to see B. seeing C. that I see D. myself to see
24. Her colleagues expected _____ the job.
A. that she gets B. her to get C. that she got D. her getting
25. You look terrible! You _____ see a doctor.
A. should to B. had better to C. had better D. would better
26. He _____ be Mexican. He doesn't speak Spanish.
A. mustn't B. isn't possibly C. can't D. must
27. He _____ have done it, but I'm not sure.
A. must B. can't C. couldn't D. might
28. It's too late. You _____ have told me before.
A. must B. can C. may D. should
29. If I _____ in your position then, I would have told the truth.
A. have been B. was C. were D. had been
30. We're looking for the lady _____ handbag was stolen yesterday.
A. of whom B. which C. whose D. the which
31. London is boring! I wish _____ in New York.
A. I would live B. that I am living
C. I lived D. that I live
32. We've reduced the price _____ sell more.
A. for to B. so to C. in order to D. so that
33. They've moved to a different house _____ their children can attend a better school.
A. in order B. so that C. for D. so as
34. If you don't have to do something, it means you _____ do it.
A. mustn't B. needn't C. don't must to D. haven't to
35. Would you like to go out this evening? No, thank you, I _____ stay at home.
A. prefer B. would rather C. would prefer D. would like
36. It was _____ beautiful day that he decided to go for a walk.
A. such a B. a so C. so very D. such

37. Despite her calm appearance, she _____ frightened.
A. spoke B. looked C. sounded D. talked
38. Don't ring at the same time tomorrow, I _____ lunch.
A. will have B. will be having
C. am going to have D. am having
39. If you're forbidden to do something, it means you _____ do it.
A. haven't got to B. needn't C. couldn't D. may not
40. I don't usually eat three meals a day, but I _____ used to it.
A. am getting B. have got C. am got D. am
41. He's a good talker. He always puts _____ his ideas very well.
A. off B. out C. over D. away
42. We tried a new marketing idea, but it didn't come _____ .
A. off B. up C. through D. on
43. This computer is useless; it's always breaking _____ .
A. off B. down C. up D. out
44. Working under pressure always brings _____ the best in him.
A. out B. up C. through D. across
45. I'm afraid I can't go _____ your decision; I think you're wrong.
A. into B. over to C. up to D. along with
46. It's hard to get _____ him; he's got such a difficult character.
A. into B. over to C. on with D. by
47. Look _____ ! That car's coming this way.
A. over B. on C. after D. out
48. If his company takes _____ ours, they'll have a monopoly.
A. out B. up C. over D. down
49. Production has slowed down because they have run _____ difficulty with a particular component.
A. out of B. against C. on D. into
50. I'm sorry but I can't make _____ what he's trying to do.
A. up B. out C. over D. off
51. Nail polish remover contains which functional group:
A. Aldehyde B. Alcohol C. Ketone D. Carboxylic acid
52. Soaps cannot be used in acidic conditions because:
A. It reacts with acid and forms a long chain of Laurel sulphate
B. It reacts with Hydrogen and acid and forms a complex stearate
C. It reacts with the acid and forms long chains of fatty acids
D. It forms salt and hydrogen gas
53. In Tritium, how many protons, electrons, and neutrons are present respectively?
A. 1, 1, 2 B. 1, 2, 2 C. 1, 3, 3 D. 2, 1, 2
54. Which of the following are not matched correctly?
A. CFCs – Depletion of the Ozone layer
B. Methane – Contribution to greenhouse effect
C. Lead compounds – responsible for the coagulation of cytoplasm
D. Carbon monoxide – Affinity for hemoglobin

55. Who proposed the law of Conservation of mass?
    A. John Dalton
    B. Joseph Gay Lussac
    C. Antoine Lavoisier
    D. Joseph Proust
56. Which of the following reactions is not feasible?
    A. $Fe + AgNO_3 \rightarrow Fe(NO_3)_3 + Ag$
    B. $Cu + ZnSO_4 \rightarrow CuSO_4 + Zn$
    C. $Mg + HCl \rightarrow MgCl_2 + H_2$
    D. $Al + CuSO_4 \rightarrow Al_2(SO_4)_3 + Cu$
57. Paracetamol is a type of:
    A. Anti-histamine
    B. Analgesic
    C. Antibiotic
    D. Antacid
58. Which of the following shows the correct order of acidic strength (from strongest to weakest) among these natural acids?
    A. Hydrochloric acid (HCl) – Sulfuric acid ($H_2SO_4$) – Ascorbic acid (Vitamin C) – Formic acid – Acetic acid (vinegar) – Carbonic acid ($H_2CO_3$)
    B. Carbonic acid ($H_2CO_3$) – Sulfuric acid ($H_2SO_4$) – Hydrochloric acid (HCl) – Formic acid – Acetic acid (vinegar) – Ascorbic acid (Vitamin C)
    C. Sulfuric acid ($H_2SO_4$) – Hydrochloric acid (HCl) – Carbonic acid ($H_2CO_3$) – Formic acid – Acetic acid (vinegar) – Ascorbic acid (Vitamin C)
    D. Sulfuric acid ($H_2SO_4$) – Hydrochloric acid (HCl) – Carbonic acid ($H_2CO_3$) – Formic acid – Acetic acid (vinegar) – Ascorbic acid (Vitamin C)
59. Tartaric acid is mainly found in:
    A. Kerosene
    B. Tomato
    C. Grapes
    D. Orange
60. Which of the following is produced as a byproduct in the Solvay process of forming baking soda?
    A. NaCl
    B. $NH_4Cl$
    C. $Cl_2$
    D. $Na_2CO_3$
61. Which of the following organisms is not holozoic?
    A. Cuscuta
    B. Amoeba
    C. Paramoecium
    D. Humans
62. Which of the statements is not correct about the Golgi apparatus?
    A. It dispatches complex polysaccharides that form the cell wall in plants.
    B. It involves the transportation of various molecules within the cell.
    C. It helps in the formation of lysosomes.
    D. It is the site of initial protein synthesis and other cellular reactions.
63. Gonorrhoea and syphilis are caused by:
    A. Protista
    B. Bacteria
    C. Virus
    D. Fungi
64. Histone proteins are _____ and _____ in nature.
    A. Acidic, positively charged
    B. Basic, positively charged
    C. Acidic, negatively charged
    D. Basic, negatively charged
65. Which part of the Bryophyllum plant propagates vegetatively?
    A. Venation of leaf
    B. Leaf margin
    C. Stalk of leaf
    D. Nodes of the stem
66. An arm of a lizard is homologous to:
    A. Wings of butterfly
    B. Appendages of a spider
    C. Arm of a frog
    D. Fin of Rohu
67. The pressure of blood is:
    A. Less in the arteries
    B. Greater in the arteries
    C. Equal in both arteries and veins
    D. Zero in veins

68. Which of the following nerves brings oxygenated blood rich in nitrogenous waste to the kidneys?
A. Renal vein
B. Pulmonary artery
C. Renal artery
D. Hepatic vein

69. What does ECG stand for?
A. Electromuscular chart
B. Electrocerebral graph
C. Electrocardiogram
D. Electrocardiographic imaging

70. Which of the following hormones is responsible for the elongation of cells in plants?
A. Gibberellins
B. Adrenaline
C. Auxin
D. Abscisic acid

71. Antedon and Holothuria are examples of:
A. Aschelmenthis
B. Arthropoda
C. Protochordata
D. Echinodermata

72. Which of the following is a Pisces?
A. Whale
B. Sea horse
C. Sea cucumber
D. Jelly fish

73. Consider the following statements:
1. Soil acidity: gypsum
2. Tooth decay: more than 5.5 pH
3. Aqua regia: dilute $HNO_3$ and conc. HCl
How many of the above are correct?
A. Only one
B. Only two
C. All three
D. None

74. With reference to ionic compounds, consider the following statements:
1. Ionic compounds are insoluble in benzene.
2. Ionic compounds in the solid state are good conductors of electricity.
Which of these statements is/are correct?
A. Only 1
B. Only 2
C. Both 1 and 2
D. Neither 1 nor 2

75. Cement is formed by strongly heating a mixture of:
A. Limestone and graphite
B. Limestone and clay
C. Chalk and graphite
D. Clay and graphite

76. The earth's atmosphere is mainly heated by which one of the following?
A. Short wave solar radiation
B. Reflected solar radiation
C. Long wave terrestrial radiation
D. Scattered solar radiation

77. Identify the correct statements—
1. Earth receives the sun's energy only at the infrared end of the spectrum.
2. Earth reradiates the sun's heat only as ultraviolet energy.
A. 1 only
B. 2 only
C. Both 1 and 2
D. None

78. The largest geographical area of India is covered by which one of the following types of soils?
A. Inceptisols
B. Entisols
C. Alfisols
D. Vertisols

79. Identify the correct statement.
A. Polar diameter is slightly less than the equatorial diameter.
B. Polar diameter is equal to equatorial diameter.
C. Polar diameter is longer than equatorial diameter.
D. Polar diameter is half of the equatorial diameter.

80. Identify direct source of information about the interior of the earth. Which of the following are correct?
1. Earthquake wave
2. Volcano
3. Gravitational force
4. Earth magnetism

A. 1 and 2 only B. 2 only C. 3 and 4 only D. 1, 2, 3 and 4

81. Which one of the following is the reason why astronomical distances are measured in light years?
    A. Distances among stellar bodies does not change.
    B. Gravity of stellar body does not change.
    C. Light always travel in straight line.
    D. Speed of light is always same.
82. On which one of the following rivers is the Tehri Hydropower Complex located?
    A. Alaknanda B. Bhagirathi C. Dhauliganga D. Mandakini
83. Which one of the following is an example of subsistence farming?
    A. Shifting cultivation B. Commercial Farming
    C. Extensive and Intensive Farming D. Organic farming
84. Which one of the following crops is not cultivated under dryland farming?
    A. Jowar B. Ragi C. Sugarcane D. Groundnut
85. During the Indian monsoon season
    A. the westerly jet stream alone exists in the Indian Region
    B. the easterly jet stream alone exist in the Indian Region
    C. Both westerly and easterly jet stream exists in the Indian region
    D. Both westerly and easterly jet stream disappear
86. Consider the correct statements regarding El Nino effect on Indian Monsoon:
    1. The surface temperature goes up in the Southern Pacific Ocean and there is deficient rainfall in India.
    2. The Walker Circulation shifts eastward from its normal position and reduces monsoon rainfall in India.
    A. 1 only B. 2 only C. Both 1 and 2 D. None
87. The continent having the largest area in equatorial belt is
    A. Asia B. South America C. Africa D. North America
88. Mid-latitude cyclones
    A. usually move across North-America from east to west
    B. are generally found only over the ocean
    C. generally bring clear skies and little precipitation
    D. are formed in region of strong temperature contrast
89. Which one of the following can be considered as an initial warning of an approaching Tsunami?
    A. Thundering noise B. Earthquakes
    C. Rapid withdrawal of water away from the beach
    D. Rapid landward movement of water
90. Which one among the following is a warm current?
    A. Labrador B. Oyashio C. California D. Agulhas
91. Which one of the following is the correct statement?
    A. Spring tide occurs on the full moon day.
    B. Neap tides occur on the new moon day only.
    C. The west coast of India experiences tides 4 times a day.
    D. Tides do not occur in gulfs.
92. Which one of the following instruments is used for measuring moisture content of air?
    A. Hydrometer B. Hygrometer C. Hypsometer D. Pycnometer

93. Which one of the following Himalayan rivers does not originate from across the Himalayas?
A. Indus B. Sutlej C. Ganga D. Brahmaputra

94. Plants with breathing roots are abundantly found in
A. Mangrove areas B. Deserts C. Tropical savannahs D. Tundra regions

95. Anasagar Lake is located in which one of the following states?
A. Gujarat B. Uttarakhand C. Rajasthan D. Karnataka

96. Consider the following statements about the Brihadeeswarar Temple (Thanjavur):
1. It was built during the reign of Raja Raja Chola I in the 11th century.
2. The temple is an example of Dravidian architecture.
3. It was primarily dedicated to Lord Vishnu.
Which of the statements given above is/are correct?
A. 1 and 2 only B. 2 and 3 only C. 1 and 3 only D. 1, 2, and 3

97. Which stupa in Andhra Pradesh is famous for its elaborate limestone carvings depicting the life of Buddha?
A. Sanchi Stupa B. Borobudur Stupa
C. Dhamek Stupa D. Amaravati Stupa

98. According to Jainism, Aparigraha refers to:
A. Non-possessiveness and non-attachment to material things
B. The law of karma
C. Liberation from the cycle of birth
D. Respect for all living beings

99. Consider the following statements about the Government of India Act, 1935:
1. It introduced provincial autonomy but retained significant powers for the Governor.
2. It proposed a federal structure including both British Indian provinces and princely states.
3. It granted the central legislature complete control over all matters related to defense, foreign affairs, and finance.
4. It abolished the separate electorate system introduced under the Government of India Act, 1919.
Which of the statements given above is/are correct?
A. 1 and 2 only B. 1, 2, and 3 only
C. 2, 3, and 4 only D. 1, 3, and 4 only

100. Assertion (A): Panini's Ashtadhyayiis considered a foundational work in Sanskrit grammar.
Reason (R): It was written in the form of stories and parables to teach grammar.
A. Both A and R are true, and R is the correct explanation of A
B. Both A and R are true, but R is not the correct explanation of A
C. A is true, R is false
D. A is false, R is true

101. Consider the following statements about newspapers during the Indian freedom struggle:
1. The Amrita Bazar Patrika, founded in Bengal, played a major role in exposing the injustices of colonial rule.
2. The Indian Sociologist, published by Shyamji Krishna Varma from London, was critical of moderate politics and supported radical nationalism.
3. Kesari, started by Bal Gangadhar Tilak in Marathi, was known for promoting social reform more than political activism.
4. The Hindu, started in Madras, initially began as a weekly to support Indian nationalist causes.
Which of the statements given above is/are correct?

A. 2 and 3 only
B. 1, 3, and 4 only
C. 1, 2, and 4 only
D. 1, 2, 3, and 4

102. Consider the following statements about Mahatma Gandhi and his works:

1. Gandhi's book Hind Swaraj (1909) criticizes Western civilization and advocates swadeshi and self-rule based on Indian tradition.
2. Gandhi started the weekly journal Young India in South Africa to propagate satyagraha.
3. The newspaper Harijan was launched by Gandhi in 1933 to campaign against untouchability and promote social reform.
4. Gandhi's autobiography, The Story of My Experiments with Truth, was originally written in Gujarati.

Which of the statements given above is/are correct?

A. 1 and 2 only
B. 1, 3, and 4 only
C. 2, 3, and 4 only
D. 1, 2, 3, and 4

103. Consider the following pairs:

| **Operation** | **Objective** |
|---|---|
| 1. Operation ShivShakti | Counter-infiltration in the Poonch sector |
| 2. Operation Mahadev | Neutralisation of Lashkar-e-Taiba operatives |

Which of the pairs given above is/are correctly matched?

A. 1 only
B. 2 only
C. Both 1 and 2
D. Neither 1 nor 2

104. Consider the following statements regarding Operation Falcon:

1. It is a joint initiative of the Indian Army and the Border Security Force.
2. The operation focuses on eliminating rhino poaching networks in Assam.

Which of the above statements are correct?

A. 1 only
B. 2 only
C. Both 1 and 2
D. Neither 1 nor 2

105.

| **Column A (Event/Case)** | **Column B (Year)** |
|---|---|
| Alipore Bomb Case | A. 1912 |
| Kakori Conspiracy | B. 1908 |
| Delhi Conspiracy Case | C. 1925 |
| Chittagong Armoury Raid | D. 1930 |

A. 1-B, 2-D, 3-C, 4-A
B. 1-A, 2-B, 3-C, 4-D
C. 1-B, 2-C, 3-A, 4-D
D. 1-C, 2-A, 3-D, 4-B

106. The Ulgulan (Great Tumult) led by Birsa Munda at the end of the 19th century was mainly directed against:

A. British forest policies and the missionary activities.
B. Exploitation by zamindars, moneylenders, and the British colonial system.
C. The demand for separate political representation for tribals in legislatures.
D. The entry of non-tribals into tribal religious institutions.

107. Which Buddhist monk debated with King Milinda (Menander) in the famous text Milindapanho?

A. Upagupta
B. Nagasena
C. Vasubandhu
D. Ashvaghosha

108. Who created history at the Asian Youth Table Tennis Championships 2025 in Tashkent, Uzbekistan, becoming the first Indian in 36 years to win the U15 girls' singles continental title?
A. Divyanshi Bhowmick
B. Deepika Sehrawat
C. Bhumika Chauhan
D. Shivani Sengar

109. Who emerged as the winner of the Super United Rapid & Blitz Croatia, adding another title to his already impressive Grand Chess Tour collection?
A. Gukesh Dommaraju
B. Harikrishnan A. Ra
C. Magnus Carlsen
D. Divya Deshmukh

110. Identify which of the following statements is incorrect.
A. CONCACAF Gold Cup 2025: Mexico beat US again in final for record 10th title.
B. Chelsea Beat PSG to Win Inaugural Edition of Club World Cup 2025.
C. England have won the Women's EURO 2025 tournament.
D. None of them is incorrect.

111. Which of the following is correct about **EXERCISE TALISMAN SABRE 2025**?
1. India joins Talisman Sabre 2024.
2. Military exercise drawing 19 nations, 35,000 forces begins in India.
Which of the following is correct?
A. 1 only
B. 2 only
C. 1 and 2 both
D. None of them

112. New dragonfly species Lyriothemis abrahami discovered in the following state of India.
A. Andhra Pradesh
B. Kerala
C. Assam
D. Karnataka

113. Which of the following Correctly matched about Ramsar sites of India?
A. Sakkarakottai Bird Sanctuary — Tamil Nadu
B. Khecheopalri wetland — Andhra Pradesh
C. Therthangal Bird Sanctuary — Sikkim
D. Udhwa Lake — Maharashtra

114. Which of the following is correct about **Operation Bashayer Al-Fath**?
A. Target: Al-Udeid Air Base in Saudi Arabia.
B. Response to France Operation Midnight Hammer.
C. Escalation linked to ongoing Israel-Iran conflict.
D. None.

115. Which of the following is the correct Statement About **MOUNT LEWOTOBI LAKI-LAKI**?
1. Recently, a volcanic eruption in Mount Lewotobi Laki-laki in Japan spewed ash cloud to a whopping 11 kilometers.
2. It is located in Indonesia's East Nusa Tenggara province on Flores Island.
Choose the correct one.
A. 1 only
B. 2 only
C. 1 and 2 Both
D. None

116. _____ an InnoEnergy portfolio company, won the 2025 Food Planet Prize – the world's largest environmental award focused on food systems – for its breakthrough technology to decarbonise nitrogen fertiliser production.
A. Javed Akhtar
B. David Beckham
C. NitroCapt
D. Sucheta Raj Khanna

117. Which of the following is Correct About The World Economic Forum (WEF) recently released **Energy Transition Index (ETI), 2025**?
1. Finland ranked first followed by Finland, Denmark and Norway.
2. India's rank dropped from rank 63 in 2024 to rank 71 in 2025.

Choose the correct option.

A. 1 only B. 2 only C. 1 and 2 both D. None

118. What is the full form of **ULLAS**?

A. Uplifting Literacy and Learning Among Students

B. Understanding Learning for Lifelong Advancement of Society

C. Understanding Lifelong Learning for All in Society

D. Uniting Literacy and Lifelong Awareness in Schools

119. Which of the following State has notified the **Tsarap Chu Conservation Reserve** under section 36A(1) of Wildlife (Protection) Act, 1972, to protect high altitude biodiversity and strengthen snow leopard habitats?

A. Andhra Pradesh B. Assam

C. Madhya Pradesh D. Himachal Pradesh (HP)

120. Identify the correct Statement.

A. India has initiated the process to develop Electric Hansa (E-HANSA), a next-generation two-seater electric trainer aircraft.

B. The Electric Hansa (E-HANSA) trainer aircraft, developed by CSIR NAL, is expected to cost significantly less than imported alternatives, possibly around Rs 2 crore.

C. The E-HANSA is part of the larger HANSA-3 (NG) trainer aircraft program, which is designed to be a cost-effective and indigenous option for pilot training in India.

D. All of the above is correct.

121. Who becomes first Indian origin musician to win AMA award?

A. Rapper Raja Kumari B. Rapper Vibha Kumari

C. Rapper Shruti Kumari D. None

122. Which of the following is **not** an essential qualification for appointment as a Governor?

A. He must not be a member of either House of Parliament.

B. He should be a domicile of the state to which he is being appointed.

C. He should be a citizen of India.

D. He must have completed the age of 35 years.

123. What is the major limitation of using bacteria for large-scale plastic degradation?

A. No bacteria have been discovered that can degrade plastics.

B. Plastic degradation by bacteria is extremely slow under natural conditions.

C. Bacteria only degrade plastic in the presence of high oxygen levels.

D. Bacteria cannot survive in landfill environments.

124. The charge of impeachment against the President of India for his removal can be preferred by:

A. Both Houses of Parliament

B. Speaker of Lok Sabha and Chairman of Rajya Sabha

C. Rajya Sabha

D. Lok Sabha

125. Consider the following statements about the Election Commission of India (ECI):

1. The Chief Election Commissioner (CEC) enjoys a tenure of five years or until the age of 65, whichever is earlier.

2. The Election Commission functions as a quasi-judicial body in resolving electoral disputes.

3. The appointment process of Election Commissioners changed after the 2023 Supreme Court ruling.

4. ECI has the power to remove a political party's recognition for violating electoral laws.

Which of the above statements are correct?

A. 1 and 2 only
B. 2, 3, and 4 only
C. 1, 2 and 3 only
D. 1, 2, 3 and 4

126. Which of the below statements are correct?

1. At the critical angle, the refracted ray makes an angle of 90° with the normal.
2. Critical angle increases when the refractive index of the denser medium increases.
3. If the angle of incidence is greater than the critical angle, total internal reflection occurs.
4. Critical angle is defined when light travels from a denser medium to a rarer medium.

A. 1, 2, and 4 only
B. 1, 3 and 4 only
C. All of the above
D. 1, 2, and 3 only

127. Which of the following statements about optical fibers is/are correct?

1. Optical fibers work on the principle of total internal reflection.
2. The refractive index of the core is greater than that of the cladding.
3. Light in an optical fiber travel faster than in air.
4. Optical fibers are used in communication and medical applications.

A. 1, 2, and 4 only
B. 1 and 3 only
C. 2 and 4 only
D. 1, 2, 3, and 4

128. The main reason a mirage is seen on a hot road during summer is:

A. Reflection
B. Scattering
C. Refraction and TIR
D. Diffraction

129. Consider the following statements about some optical phenomena:

1. Rainbow formation is due to refraction, dispersion, and total internal reflection of sunlight in raindrops.
2. Twinkling of stars is due to atmospheric refraction.
3. The blue color of the sky is due to scattering of shorter wavelengths of light.
4. Mirage is caused by diffraction of light in air layers of varying density.

A. 1, 2, and 3 only
B. 1 and 3 only
C. 2 and 4 only
D. 1, 2, 3, and 4

130. Accommodation of the human eye refers to:

A. The ability of the iris to control the light entering the eye.
B. The ability of the ciliary muscles to change the focal length.
C. The formation of an image on the retina irrespective of object distance.
D. The movement of the eyeball to track moving objects.

131. Match the following eye defects with the type of lens used for correction:

| | |
|---|---|
| 1. Myopia | A. Convex lens |
| 2. Hypermetropia | B. Concave lens |
| 3. Presbyopia | C. Cylindrical lens |
| 4. Astigmatism | D. Bifocal lens |

A. 1-B, 2-A, 3-D, 4-C
B. 1-A, 2-B, 3-C, 4-D
C. 1-B, 2-D, 3-A, 4-C
D. 1-C, 2-A, 3-D, 4-B

132. Which types of lenses/mirrors are used in a compound microscope?

A. Both lenses are concave
B. Both lenses are convex
C. Lens is concave, mirror is convex
D. Lens is convex, mirror is concave

133. If the charge on object A is **Q** and the charge on obj B is **2Q** and the distance between them is **100 m** then the Force ratio will be:

A. F ab = 2F ba B. F ab = ½F ba C. F ab = 4F ba D. F ab = F ba

134. A current of **30 A** flows through a DC machine for **10 minutes**. The total charge passed is:

A. 600 C B. 300 C C. 18000 C D. 3000 C

135. Which of the above statements are correct?

1. For most metallic conductors, resistance increases with increase in temperature.
2. For semiconductors, resistance decreases with increase in temperature.
3. Increasing temperature of alloy, Resistance Increase but larger than the conductor.
4. Increasing the temperature of electrolytes decreases the resistance.

A. 1 and 2 only B. 1, 2 and 3 only C. 1, 2 and 4 only D. All 1, 2, 3 and 4

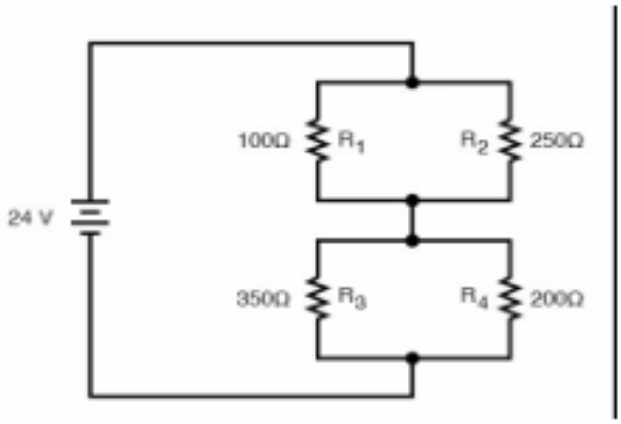
136. A wire of length **L** has a resistance of **5 Ω**. If the wire is stretched so that its new length becomes **3 times** the original length without any change in volume, what will be its new resistance?

A. 15 Ω B. 45 Ω C. 5 Ω D. 9 Ω

137. In an electric circuit, a wire of resistance **12 Ω** is used. If this wire is stretched to a length **four times** its original value (volume remains constant), the current in the circuit would become:

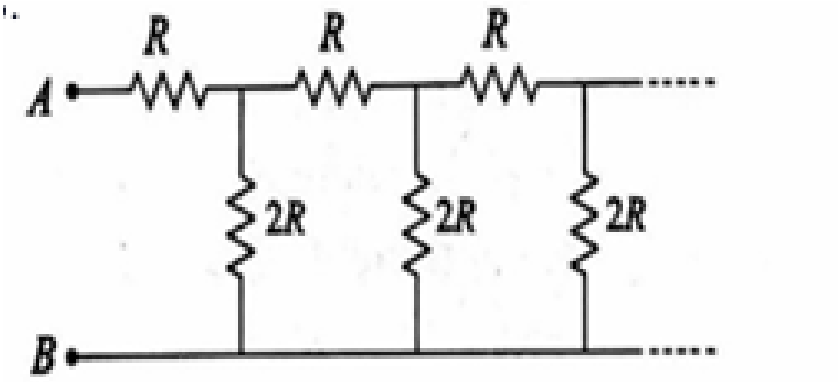
A. One-fourth B. Sixteenth C. One-twelfth D. One-sixteenth

138. Find the total current in the following circuit in ampere:




A. 198 B. 0.121 C. 1.98 D. 0.241

139. An infinite ladder network is arranged with resistances R and 2R as shown. The effective resistance between terminals A and B is:




A. Infinite B. 2R C. R D. $2+\sqrt{3}$ R

140. Consider the following statements regarding the conversion of a galvanometer into an ammeter and voltmeter:

1. A low resistance called shunt is connected in parallel with the galvanometer — for an ammeter.

2. A high resistance is connected in series with the galvanometer — for voltmeter.
3. A low resistance called shunt is connected in parallel with the galvanometer — for voltmeter.
4. A high resistance is connected in series with the galvanometer — for ammeter.

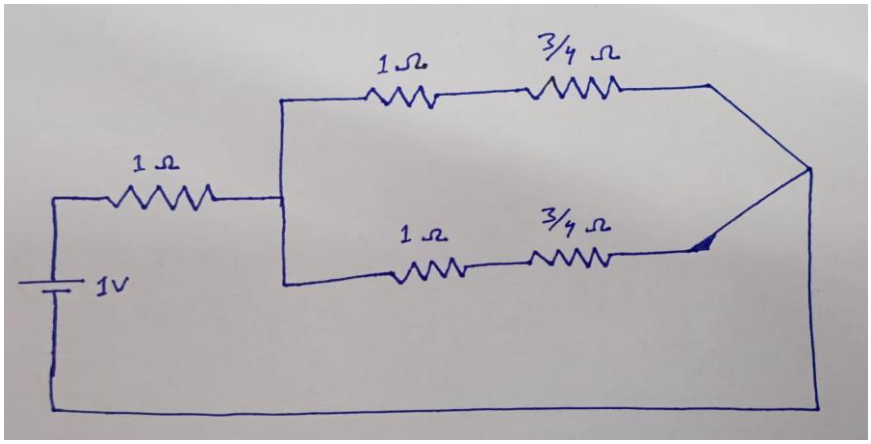
Which of the above statements are correct?

A. 1 and 2 only
B. 1, 2 and 4 only
C. 3 and 4 only
D. All of the above

141. An electric bulb is rated **100 W** at **220 V**. What would be its power consumption if it is operated at **110 V**?

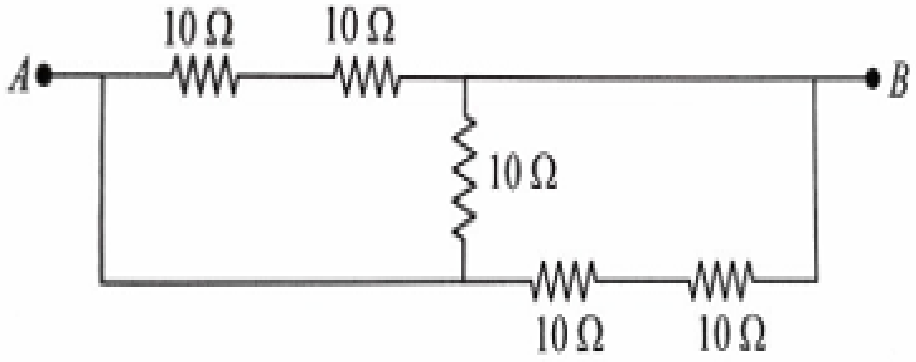
A. 100 W
B. 75 W
C. 50 W
D. 25 W

142. What will be the current in the circuit in ampere:




A. 15/8
B. 15/7
C. 7.5
D. 8/15

143. Find the Req of the given resistors across AB.




A. 5 Ω
B. 6 Ω
C. 4 Ω
D. 10 Ω

144. Consider the following statements about a long solenoid:

1. The magnetic field inside an ideal solenoid is uniform and parallel to its axis.
2. The magnetic field inside a solenoid is directly proportional to the number of turns per unit length.
3. The magnetic field inside a solenoid is directly proportional to the current passing through it.
4. The magnetic field inside a solenoid depends on the shape of its cross section.

A. 1, 2 and 3 only
B. 1 and 4 only
C. 2 and 4 only
D. All 1, 2, 3 and 4

145. The time period of a simple pendulum is T when its length is L. If the length of the pendulum is increased to 9 times the original length, the new time period will be:

A. T/3
B. 3T
C. 9T
D. T/9

146. The speed of sound in air will be higher on which type of day?
    A. On a cold day
    B. On a dry day
    C. On a humid day
    D. It is the same in all conditions
147. A person stands 170 m away from a vertical cliff and shouts. If the speed of sound in air is 340 m/s, after how much time will he hear the echo?
    A. 0.5 s
    B. 1.0 s
    C. 2.0 s
    D. 1.5 s
148. A heater of resistance 20 Ω is connected to a 220 V supply. What is the power consumed by the heater?
    A. 220 W
    B. 2420 W
    C. 1100 W
    D. 4840 W
149. A coil of resistance 10 Ω carries a current of 5 A for 2 minutes. How much heat is produced in the coil?
    A. 1000 J
    B. 3000 J
    C. 6000 J
    D. 30000 J
150. Electric current is:
    A. Scalar quantity
    B. Vector quantity
    C. Can't determine
    D. Neither scalar nor vector