

H<sub>2</sub>O

## CHANDIGARH NTSE STAGE – I (2019-20)

### SCHOLASTIC APTITUDE TEST – 2019

ROLL NUMBER:

**Time: 120 Minutes**

**Maximum Marks: 100**

*Please read the instructions carefully.*

#### **Scholastic Aptitude Test**

##### **Instructions to the Candidates**

**Read the following instructions carefully before you answer the question:**

1. Answer are to be given on a SEPARATE ANSWER SHEET.
2. Please write your twelve digits Roll Number very clearly on the Test-booklet and Answer Sheet as given in your admission card.
3. Please note and follow the instructions given on the answer sheet for writing the answers.
4. Darken the CIRCLE with pen for answering the question in the appropriate space against the number corresponding to the question you are answering.
5. There are 100 questions in the test.
6. Since all questions are compulsory, do not try read the whole question paper before beginning to answer it.
7. If you do not know the answer to any question, do not spend much time on it and pass on to the next one. Time permitting, you can come back to the question, which you have left in the first instance and try them again.
8. Since the time allotted for this question paper is very limited you should make the best use of it by not spending too much time on any one question.
9. Rough work can be done anywhere in the booklet but not on the answer sheet/loose paper.
10. Every correct answer will be awarded one mark.
11. Please return the answer sheet to the invigilator after the test.

**Please turn over the page and start your work.**

## CHANDIGARH STAGE 1– 2019-20

### Scholastic Aptitude Test

1. Slavery was finally abolished in French colonies in \_\_\_\_\_.  
 (A) 1848 (B) 1815  
 (C) 1804 (D) 1884
  
2. Put the following events in sequence.  
 (i) Return of Lenin  
 (ii) October Revolution  
 (iii) Russian peace with Germany  
 (iv) February Revolution  
 (v) Centralised Planning  
 (A) i, iii, iv, v, ii (B) iv, i, ii, iii, v  
 (C) iv, ii, i, iii, v (D) ii, v, i, iii, v
  
3. Name the minister of propoganda under the Hitler Rule.  
 (A) Joseph Goebbels (B) Hindenburg  
 (C) Hjalmar Schacht (D) Ernest Heimer
  
4. Name the axis powers in second world war  
 (A) Germany, Italy, Japan (B) Germany, Austria, Prussia  
 (C) Germany, Austria, Russia (D) Germany, Japan, Russia
  
5. Consider the following Indian leaders.  
 i Motilal Nehru  
 ii Dada Bhai Naoroji  
 iii Raja Ram Mohan Roy  
 iv Mahatma Gandhi  
 The correct Chronological order in which they appeared on national scene is  
 (A) i, ii, iii, iv (B) iv, iii, ii, i  
 (C) iii, ii, i, iv (D) ii, i, iii, iv
  
6. Who founded SATYASHODHAK SAMAJ.  
 (A) Jyotiba Phule (B) Raja Ram Mohan Roy  
 (C) Swami Vivekanand (D) Swami Dayanand
  
7. Which of the following picture was on cover page of music book by E.T. Paul  
 (A) Dawn of century (B) Dawn of industrial age  
 (C) Dawn of Agricultural age (D) Dawn of 21<sup>st</sup> Century
  
8. Choose the correct statements:  
 i. The Zollverein was formed in 1834  
 ii. It abolished tariff barriers.  
 iii. It reduced the number of currencies from thirty to one  
 iv. It was initiative of prussia and joined by all German states  
 (A) i, ii, iii, iv (B) ii and iii  
 (C) i, ii and iv (D) ii, iii and iv
  
9. The people gathered in Jallianwala Bagh to protest against the arrest of two leaders They were \_\_\_\_\_.  
 (A) Bhagat Singh and Dr. Satyapal (B) Bhagat Singh and Rajguru  
 (C) Dr. Saifuddin Kitchlu and Mahatma Gandhi (D) Dr. Saifuddin Kitchlu and Dr. Satyapal
  
10. The national assembly of France voted in April 1792 to declare war against \_\_\_\_\_.  
 (A) Germany and Austria (B) Germany and England  
 (C) Prussia and England (D) Prussia and Austria
  
11. Out of 250 members of Rajya Sabha, how many members are nominated by president.  
 (A) 11 (B) 10  
 (C) 14 (D) 12
  
12. Which article in Indian Constitution stipulates that there shall be vice- President of India  
 (A) Article 63 (B) Article 65  
 (C) Article 66 (D) Article 62

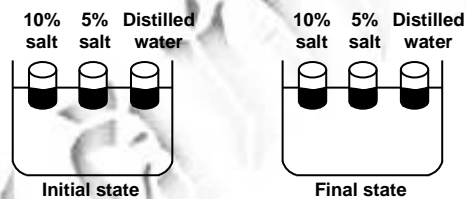
13. Point out the difference between the local government in India before and after the constitutional amendment in 1992.
- It became mandatory to hold regular elections to the local government bodies
  - One third positions reserved for women
  - Elected officials exercise supreme
- (A) Only i (B) i and ii  
(C) i, ii and iii (D) ii and iii
14. When did the civil rights movement take place in USA
- (A) 1953-1958 (B) 1954-1968  
(C) 1960-1970 (D) 1946-1978
15. When was Bhartiya Janta Party formed?
- (A) 10<sup>th</sup> April, 1975 (B) 6<sup>th</sup> April, 1970  
(C) 6<sup>th</sup> April, 1980 (D) 10<sup>th</sup> April, 1985
16. In the context of democracies, what is successfully done by democracies?
- (A) Eliminated conflicts among people  
(B) Eliminated economic inequalities among people  
(C) Eliminated differences of opinion about how marginalized actions are to be treated  
(D) Rejected the ideal of political inequality
17. Who passed "Legal Frame work Order 2002"?
- (A) Zanu (B) Robert Mugabe  
(C) General Musharraf (D) Allende
18. Select the right combination of subjects under union list.
- (A) Defence, Atomic energy, Post and telegraphs, war and peace  
(B) Railways, Land, Trade, Police  
(C) Education, Agricultural land, Trade, Defence  
(D) Cyber laws, Adoption, Trade, Forests
19. Which one of the following countries was the first one to grant Universal Suffrage?
- (A) Russia (B) Germany  
(C) New Zealand (D) The Netherland
20. Which of the following is working capital?
- (A) Electricity bill (B) Tube well  
(C) Tractor (D) Machines
21. Coins in India are minted by
- (A) Ministry of Finance, Government of India  
(B) Reserve Bank of India  
(C) State Bank of India  
(D) Central Bank of India
22. What should be included in national income by expenditure method
- Self-produced final product
  - Expenditure on second hand goods
  - Expenditure on shares
  - Expenditure on intermediate goods
- (A) ii, iii, iv (B) i and ii  
(C) i only (D) iii and iv
23. What is the definition of overweight?
- (A) BMI > 25 kg/m<sup>2</sup> (B) BMI = 25 kg/m<sup>2</sup>  
(C) BMI = 25-29.9 kg/m<sup>2</sup> (D) BMI = 25-30 kg/m<sup>2</sup>
24. Name one of the following Agency that develops standards for goods and services.
- (A) COPRA (B) National Consumer forum  
(C) Consumer protection council (D) Bureau of Indian Standards
25. National Food for work programme was Launched in\_\_\_\_\_.
- (A) 2003 (B) 2001  
(C) 2004 (D) 2005
26. Which of the following countries has poor natural resources but rich human resources
- (A) India (B) Nepal  
(C) Japan (D) Sri Lanka

27. What is the Gross National Product?  
 (A) The total value of Goods and services manufactured in the country  
 (B) The total value of all the transactions in the country  
 (C) Reduction in the total value of goods and services produced in the country  
 (D) The total worth of goods and services generated in the country and net factor income from abroad.
28. Which one of the following is an incorrect fact regarding south India.  
 (A) Diurnal range of temperature is less (B) Annual range of temperature is less  
 (C) Temperatures are high throughout the year. (D) Extreme climatic conditions are found here.
29. Read the two statements A and B and choose the best answer.  
 A. Assertion: Petrochemical Industry is a fast-growing Industry.  
 B. Reason: Synthetic rubber, plastics, insecticides etc are the products of petro chemical industry  
 (A) A and B both are correct and B explains A  
 (B) A and B are both correct but B does not explain A  
 (C) A is correct but B is incorrect  
 (D) A and B are both incorrect
30. The process of "Retting" is associated with which of the following?  
 (A) Tea (B) Coffee  
 (C) Jute (D) Rubber
31. The "Golden Quadrilateral" which connects Delhi-Mumbai-Chennai-and Kolkata passes through....  
 (A) AMRITSAR-AHMEDABAD-PUNE-PATNA  
 (B) JAIPUR-PORBANDER-HYDERABAD-VARANASI  
 (C) VADODARA-PUNE-VISHAKHAPATNAM-VARANASI  
 (D) NAGPUR-BHOPAL-SURAT-AMRITSAR
32. The Narmada river in the peninsular plateau flows westward with a remarkably straight channel. It is because \_\_\_\_\_.  
 (A) Slope gradient in this part controls the river channel pattern  
 (B) River carries huge amount of water which has created straight channel course  
 (C) River forms the boundary between central highlands and the Deccan Plateau  
 (D) River flows through the trough of a rift valley inclined westward
33. If it is 12 noon in a city located on 90° W longitude, what would be time in a city located on 105°W longitude  
 (A) 13:00 (B) 12:30  
 (C) 11:30 (D) 11:00
34. Iron ore from kudermukh is most likely to be exported through  
 (A) Goa (B) Kochi  
 (C) Mangalore (D) Ennore
35. Marble is a type of \_\_\_\_\_ rock.  
 (A) Sedimentary (B) Metamorphic  
 (C) Basalt (D) Igneous
36. Match the following:
- |     |           |   |           |
|-----|-----------|---|-----------|
| I   | Iron      | a | Digboi    |
| II  | Coal      | b | Singhbhum |
| III | Manganese | c | Balaghat  |
| IV  | Oil       | d | Raniganj  |
- (A) i-b, ii-d, iii-a, iv-c (B) i-b, ii-d, iii-c, iv-a  
 (C) i-d, ii-b, iii-a, iv-c (D) i-d, ii-b, iii-c, iv-a
37. Which of the following is found on the foothills and river valley placer deposits:  
 (A) lead (B) gypsum  
 (C) bauxite (D) gold
38. Choose the false statement among the following statements:  
 (A) The southwest monsoon is a continuation of the southeast trade wind, deflected towards the Indian subcontinent after crossing the equator.  
 (B) In winter, India is under the influence of North west monsoon due to westerly jet stream  
 (C) The southwest monsoon sets in over the Kerala coast by 1<sup>st</sup> june.  
 (D) The shift in the position of the ITCZ is related to the phenomena of the withdrawal of the westerly jet stream from its position over the north Indian plain.

39. Aus, Aman and Boro, grown thrice in a year are types of \_\_\_\_\_ crops.  
 (A) Maize (B) Rice  
 (C) Millets (D) Wheat
40. Which of the following is the type of plate boundary of Indian plate along Himalayan mountains.  
 (A) Ocean-Continent Convergence (B) Divergent boundary  
 (C) Transform boundary (D) Continent-continent convergence

**BIOLOGY**

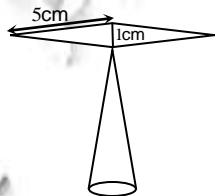
41. The process of formation of seed without the act of fertilization is known as:  
 (A) Parthenogenesis (B) Sporulation  
 (C) Apomixis (D) Vegetative reproduction
42. If the tip of sugarcane plant is removed from the field, even then it keeps on growing in length. It is due to the presence of:  
 (A) Cambium (B) Apical Meristem  
 (C) Lateral Meristem (D) Intercalary Meristem
43. Which among the following has specialized tissue for conduction of water:  
 (i) Thallophyta (ii) Bryophyta  
 (iii) Pteridophyta (iv) Gymnosperms  
 (A) (i) and (ii) (B) (ii) and (iii)  
 (C) (iii) and (iv) (D) (i) and (iv)
44. If pepsin is lacking in gastric juice then which of the following event in stomach will be affected:  
 (A) Digestion of starch into sugars (B) Digestion of fats into glycerol and fatty acids  
 (C) Digestion of Nucleic acids (D) Digestion of proteins into peptides
45. Colorblindness is more common in males than in females due to:  
 (A) Dominant gene of such trait lies on Y chromosomes  
 (B) Dominant gene of such trait lies on X chromosome  
 (C) Recessive gene lies on X chromosome  
 (D) Recessive gene lies on Y chromosome
46. Three cylinders each closed by a membrane permeable to water and containing a different fluid are placed in same solution. After adjusting to solution the fluid rises in one of the cylinder, remains the same in another and falls in the third. What is the concentration of the solution in which cylinders have been placed:



- (A) 0% salt solution (B) 2.5% salt solution  
 (C) 5% salt solution (D) 10% salt solution
47. Mitochondria and chloroplast are:  
 (i) Semiautonomous organelles  
 (ii) Formed by division of pre existing organelles and the contain DNA but lack protein synthesizing machinery  
 Which one of the following option is correct:  
 (A) Both (i) and (ii) are correct (B) (ii) is true, (i) is false  
 (C) (i) is true but (ii) is false (D) Both (i) and (ii) are false
48. Climbers grow towards and around a support is an example of:  
 (A) Hydrotropism (B) Geotropism  
 (C) Haptotropism (D) Phototropism
49. Which of the following statement about transmission of nerve impulse is incorrect:  
 (A) Nerve impulse travels from dendritic end towards axonal end  
 (B) At the dendritic end electrical impulses bring about the release of some chemicals which generate an electrical impulse at the axonal end of another neuron  
 (C) The chemicals released from axonal end of one neuron cross the synapse and generate a similar impulse in a dendrite of another neuron  
 (D) A neuron transmits electrical impulses not only to another neuron but also to muscle and gland cell

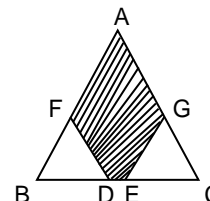
50. Which of the following is an example of homologous organs?  
 (A) Wings of a bat and a butterfly (B) Wings of a bird and a bat  
 (C) Wings of pigeon and a butterfly (D) Forelimbs of cow and lizard
51. As we travel along the food chain, the concentration of DDT  
 (A) Increases (B) Remains constant  
 (C) Decreases (D) Fluctuate randomly
52. Which among the following statements are true for unisexual flowers?  
 (i) They possess both stamens and carpel  
 (ii) They possess either stamen or carpel  
 (iii) They exhibit cross pollination  
 (iv) Unisexual flowers possessing only stamens cannot produce fruits  
 (A) (i) and (iv) (B) (ii), (iii) and (iv)  
 (C) (iii) and (iv) (D) (i), (iii) and (iv)
53. Lack of oxygen in muscles often leads to cramps among cricketers. This is due to:  
 (A) Conversion of pyruvate to lactic acid (B) Conversion of pyruvate to glucose  
 (C) Non-conversion of glucose to pyruvate (D) Conversion of pyruvate to ethanol
54. Choose the correct path of urine in our body:  
 (A) Kidney → Ureter → Urinary bladder → Urethra (B) Kidney → Ureter → Urethra → Urinary bladder  
 (C) Kidney → Urinary bladder → Urethra → Ureter (D) Urinary bladder → Kidney → Ureter → Urethra

**MATHEMATICS**

55. The area of the Blades of the magnetic compass as shown in figure will be:  
 (Take  $\sqrt{11} = 3.32$ )  
 (A) 9 cm<sup>2</sup>  
 (B) 5.58 cm<sup>2</sup>  
 (C) 11 cm<sup>2</sup>  
 (D) 4.98 cm<sup>2</sup>
- 
56. By selling 12 oranges for a rupee, a man losses 20%. How many for a rupee should he sell to gain 20%:  
 (A) Rs. 15 (B) Rs. 10  
 (C) Rs. 8 (D) Rs. 5
57. In an Arithmetic Progression, the sum of first 'n' terms is  $\frac{3n^2}{2} + \frac{5n}{2}$ . Then the 25<sup>th</sup> term will be:  
 (A) 4 (B) 3  
 (C) -4 (D) 3.5
58. Probability that a leap year selected at random will contain 53 Sundays is:  
 (A)  $\frac{2}{7}$  (B)  $\frac{53}{365}$   
 (C)  $\frac{1}{7}$  (D)  $\frac{7}{365}$
59. If  $A + B = 90^\circ$  then  $\frac{\tan A \tan B + \tan A \cot B}{\sin A \sec B} - \frac{\sin^2 B}{\cos^2 A}$  is equal to:  
 (A)  $\cot^2 A$  (B)  $\cot^2 B$   
 (C)  $-\tan^2 A$  (D)  $-\cot^2 A$

60.  $\triangle ABC$  is an Equilateral triangle. We have  $BD = EG = DF = DE = EC$ ; then the ratio of the area of the shaded portion to the area of  $\triangle ABC$  is :

- (A)  $\frac{4}{11}$   
 (B)  $\frac{7}{9}$   
 (C)  $\frac{5}{12}$   
 (D)  $\frac{6}{7}$



61. A solid consists of a rectangular cylinder with an exact fitting right circular cone placed on the top. Height of the cone is 'h'. If total volume of the solid is three times the volume of the cone, then the height of the circular cylinder is :
- (A)  $\frac{2h}{9}$  (B)  $\frac{2h}{3}$   
 (C)  $\frac{3h}{2}$  (D)  $\frac{4h}{3}$
62. An aeroplane is flying horizontally at a height of 3150m above horizontal plane ground. At a particular instant, it passes another plane Vertically below it. At this instant, the angles of elevation of the planes from a point on the ground are  $30^\circ$  and  $60^\circ$ . Hence the distance between the two planes at that instant is:
- (A) 1050 m (B) 2100 m  
 (C) 4200 m (D) 5250 m
63. The compound interest is Rs. 6.40 more than the simple interest. If a sum is lent for 2 years at 8% compound interest. The sum will be:
- (A) Rs. 1800 (B) Rs. 10,000  
 (C) Rs. 800 (D) Rs. 1000
64. If a, b, c, d and e are in continuous proportion, then a/e is equal to:
- (A)  $\frac{a^3}{b^3}$  (B)  $\frac{a^4}{b^4}$   
 (C)  $\frac{b^3}{a^3}$  (D)  $\frac{b^4}{a^4}$
65. The line segment joining the points (3, -4) and (1, 2) is trisected at the points P & Q. If the coordinates of P & Q are (p, -2) &  $\frac{5}{3}, q$  respectively. Find the value of p & q.
- (A)  $p = 0, q = \frac{7}{3}$  (B)  $p = \frac{7}{3}, q = 0$   
 (C)  $p = 7, q = 3$  (D)  $p = 3, q = 7$
66. What will be the area of largest triangle that can be inscribed in the semicircle of radius  $\frac{r}{16}$
- (A)  $16r^3$  (B)  $\frac{r^2}{256}$   
 (C)  $\frac{r^2}{64}$  (D)  $\frac{r^2}{32}$
67. If  $x + y + z = 0$  &  $x \neq 0, y \neq 0, z \neq 0$  then the value of  $\frac{x^2}{yz} + \frac{y^2}{xz} + \frac{z^2}{xy}$  is?
- (A) 0 (B) 1  
 (C) 2 (D) 3
68. If  $x^2 + y^2 + z^2 = r^2$  where,  $x = r \cos a \cos b, y = r \cos a \sin b$  then z has one of the following values.
- (A)  $r \cos a$  (B)  $r \tan a \cos b$   
 (C)  $r \tan a \tan b$  (D)  $r \sin a$
69. If  $\alpha$  &  $\beta$  are the roots of the equation  $3x^2 - 5x + 3 = 0$  then the quadratic equation whose roots are  $\alpha^2\beta$  and  $\alpha\beta^2$  is
- (A)  $3x^2 - 5x - 3 = 0$  (B)  $3x^2 - 8x + 5 = 0$   
 (C)  $3x^2 - 8x + 3 = 0$  (D)  $3x^2 - 5x - 3 = 0$
70. The sum of length, breadth and height of cuboid is 19m, its diagonal is  $5\sqrt{5}$  m long. Its surface area is
- (A)  $286m^2$  (B)  $236 m^2$   
 (C)  $226m^2$  (D)  $256m^2$
71. A conical vessel of radius 6m and height 8 m is completely filled with water. A sphere is lowered into the water and its size is such that when it touches the side, it is just completely immersed. what fraction of water over flowed?
- (A)  $\frac{5}{8}$  (B)  $\frac{3}{4}$   
 (C)  $\frac{3}{8}$  (D)  $\frac{5}{4}$

72. If a, b, c are the sides of right triangle where C is the hypotenuse, then radius 'r' of the circle which touches the sides of the triangle is
- (A)  $\frac{a+b+c}{2}$  (B)  $\frac{a+c-b}{2}$   
 (C)  $\frac{a+b-c}{2}$  (D)  $\frac{b+c-a}{2}$
73.  $\triangle ABC$  is right angled at B. AD, CE are the two medians drawn from A and C respectively. If  $AD = \frac{3\sqrt{5}}{2}$ ,  $CE = 2\sqrt{5}$ . The value of AC will be
- (A) 13 (B) 5  
 (C)  $12\sqrt{5}$  (D) 12
74. If two circles are such that the centre of one lies on the circumference of the other then the ratio of common chord of the two circles to the radius of any one of the circles is:
- (A) 2 : 1 (B)  $\sqrt{3} : 1$   
 (C)  $\sqrt{5} : 1$  (D) 4:1

**CHEMISTRY**

75. Which of the following is most malleable metal?
- (A) Na (B) Si  
 (C) Au (D) Pb
76. When carbon dioxide is passed through lime water then:
- (A) Calcium hydroxide is formed (B) Colour of lime water disappears  
 (C) White precipitates of calcium carbonate is formed (D) White precipitates of calcium oxide is formed
77. Arrange the following elements in the order of their decreasing metallic character:
- (A)  $Cl > Si > Al > Mg > Na$  (B)  $Na > Mg > Al > Si > Cl$   
 (C)  $Na > Al > Mg > Cl > Si$  (D)  $Al > Na > Si > Ca > Mg$
78. Meena visited a natural gas compressing unit and found that the gas can be liquefied under specific conditions of temperature and pressure while sharing her experience with friends she got confused. Help her to identify the correct set of conditions.
- (A) Low temperature, Low pressure (B) High temperature, Low pressure  
 (C) Low temperature, High pressure (D) High temperature, High pressure
79. The scattering of beam of light is shown by.....
- (A) Mud water (B) Milk  
 (C) copper sulphate solution (D) NaCl solution
80. What is the formula of acetone:
- (A)  $CH_3CH_2COOH$  (B)  $CH_3COCH_3$   
 (C)  $CH_3CH_2CHO$  (D)  $CH_3CH_2COCH_3$

81. Match the correct atomic radius with the element

Element	Atomic radius (pm)
(a) Be	(i) 75
(b) C	(ii) 88
(c) O	(iii) 111
(d) B	(iv) 77
(e) N	(v) 74

- (A) (a) – (ii), (b) – (iii), (c) – (v), (d) – (iv), (e) – (i)  
 (C) (a) – (ii), (b) – (iv), (c) – (iii), (d) – (i), (e) – (v)

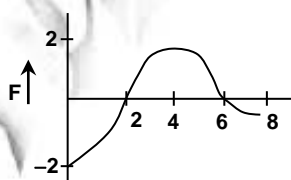
- (B) (a) – (iii), (b) – (iv), (c) – (v), (d) – (ii), (e) – (i)  
 (D) (a) – (v), (b) – (iii), (c) – (iv), (d) – (ii), (e) – (i)



82. 22 carat gold means  
 (A) 20 parts of pure gold alloyed with 2 parts of Cu or Ag  
 (B) 22 parts of pure gold alloyed with 2 parts of Cu or Zn  
 (C) 21 parts of pure gold alloyed with 1 parts of Cu or Ag  
 (D) 22 parts of pure gold alloyed with 2 parts of Cu or Ag
83. Anodising is a process of forming a thick oxide layer of.....  
 (A) Zinc (B) Aluminium  
 (C) Copper (D) Tin
84. Which of the following element does not have allotrope  
 (A) P (B) B  
 (C) Bi (D) S
85. Which of the following combination about acids is incorrect  
 (A) Ethanoic acid Vinger  
 (B) Citric acid Orange  
 (C) Carbonic acid Soft Drinks  
 (D) Lactic acid Tea
86. Which is chemically most active non-metal.  
 (A) Br<sub>2</sub> (B) N<sub>2</sub>  
 (C) O<sub>2</sub> (D) F<sub>2</sub>

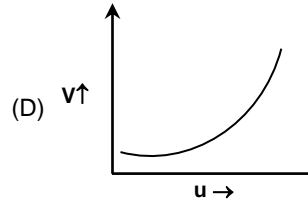
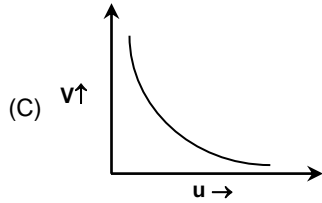
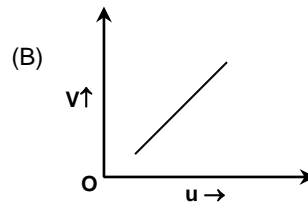
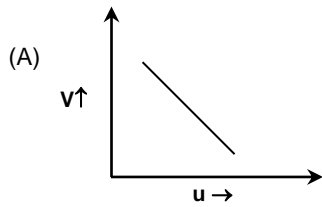
### PHYSICS

87. A ball is released from the top of a tower of height  $h$  meter. It takes  $T$  seconds to reach the ground. What is the position of the ball at  $T/3$  second?  
 (A)  $\frac{8h}{9}$  m from the ground (B)  $\frac{7h}{9}$  m from the ground  
 (C)  $\frac{h}{9}$  m from the ground (D)  $\frac{17h}{18}$  m from the ground
88. Two bodies have masses  $2m$  and  $m$ . their kinetic energies are in the ratio  $8:1$ . Their linear momentum are in the ratio of  
 (A) 1:1 (B) 2:1  
 (C) 4:1 (D) 8:1
89. Water is pouring down from a waterfall at the rate of  $75$  kg/s on the blades of a turbine. If the height of the fall is  $100$ m, then power delivered to the turbine is nearly  
 (A)  $95$  kw (B)  $75$  kw  
 (C)  $100$  kw (D)  $0$  kw
90. A force-time graph for a linear motion is shown. The linear momentum changed between  $0$  and  $8$  second is



- (A)  $-2\pi$  Ns (B) Zero  
 (C)  $4\pi$  Ns (D)  $6\pi$  Ns
91. The length of a given cylindrical wire is increased by  $100\%$ . Due to consequent decrease in diameter, the change in the resistance of the wire will be  
 (A)  $200\%$  (B)  $100\%$   
 (C)  $50\%$  (D)  $300\%$

92. In an experiment to find the focal length of a concave mirror, a graph is drawn between magnitude of  $u$  and  $v$ . The graph looks like



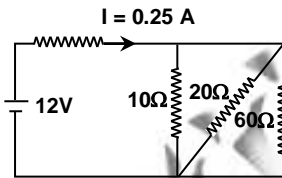
93. Two circular coils of diameter 10 cm and 20 cm has same number of turns. The ratio of magnetic field inductions produced at the centres of coils when connected in series is

- (A) 1:2 (B) 3:2  
(C) 2:1 (D) 2:3

94. Green light of wavelength 5460 Å is incident on an air-glass interface. If the refractive index of glass is 1.5, the wavelength of light in glass would be (given velocity of light in air  $c = 3 \times 10^8 \text{ ms}^{-1}$ )

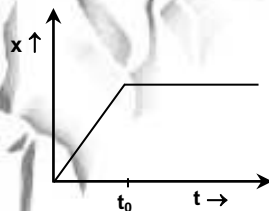
- (A) 3460 Å (B) 5460 Å  
(C) 4861 Å (D) None of the above

95. What is the value of  $R$  in the circuit given below if the current passing through the battery is 0.25 A.



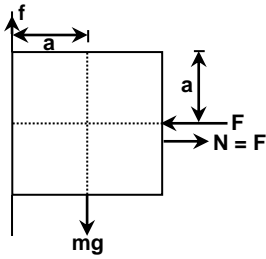
- (A) 42 Ω (B) 62 Ω  
(C) 84 Ω (D) None of these

96. Figure shows the displacement-time graph of a particle moving along X-axis.



- (A) The particle is continuously going in positive x-direction  
(B) The particle is at rest  
(C) The velocity increases upto time ' $t_0$ ' and then becomes constant  
(D) The particle moves at a constant velocity upto time ' $t_0$ ' and then stops

97. A block of mass  $m$  is at rest under the action of force  $F$  against a wall as shown in figure. Which of the following statement is incorrect?



- (A)  $F = mg$  (where  $f$  is the frictional force)  
 (B)  $F = N$  (where  $N$  is the normal force)  
 (C)  $F$  will not produce torque  
 (D)  $N$  will not produce torque
98. A hot and cold body are kept in vacuum separated from each other. Which of the following causes decrease in temperature of the hot body?  
 (A) Radiation  
 (B) Convection  
 (C) Conduction  
 (D) Temperature remains unchanged
99. A man is standing at the middle point between two cliffs. On clapping his hands, a series of echoes are heard at the interval of 1 Sec. If the speed of sound is 350 m/s, the distance between the two cliffs is  
 (A) 175 m  
 (B) 350 m  
 (C) 525 m  
 (D) 700 m
100. A rubber ball filled with water is having a small hole. This is used as the bob of a simple pendulum. Then, the period of such a pendulum  
 (A) Decreases  
 (B) First increases then decreases  
 (C) First decreases then increases  
 (D) Increases

# CHANDIGARH NTSE STAGE 1 2019-20 (SCHOLASTIC APTITUDE TEST)

## ANSWER KEYS

1. A	2. B	3. A	4. A	5. C
6. A	7. A	8. C	9. D	10.D
11.D	12.A	13.B	14.B	15.C
16.D	17.C	18.A	19.C	20.A
21.A	22.C	23.A	24.D	25.C
26.C	27.D	28.D	29.A	30.C
31.C	32.D	33.D	34.C	35.B
36.B	37.D	38.D	39.B	40.D
41.C	42.D	43.C	44.D	45.C
46.C	47.C	48.C	49.B	50.D
51.A	52.B	53.A	54.A	55.D
56.C	57.**	58.A	59.B	60.B
61.B	62.B	63.D	64.B	65.B
66.B	67.D	68.D	69.A	70.B
71.C	72.C	73.B	74.B	75.C
76.C	77.B	78.C	79.B	80.B
81.B	82.**	83.B	84.C	85.D
86.D	87.A	88.C	89.B	90.B
91.D	92.C	93.C	94.A	95.A
96.D	97.D	98.A	99.A	100. B

**\*\* None of the option is correct**

**HINTS & SOLUTION****BIOLOGY**

41. C.

**Sol:** Apomixis is the asexual formation of seed from the maternal tissues of ovule, avoiding the process of fertilization.

42. D

**Sol:** Because intercalary meristem is present at nodes & internodes.

43. C

**Sol:** Because pteridophytes and gymnosperms have xylem and phloem but absent in bryophytes and thallophytes.

44. D

**Sol:** Pepsin helps in the digestion of proteins

45. C

**Sol:** Because colour blindness is a recessive X-linked disease.

46. C

**Sol:** Because 'B' tube has 5% salt solution and no change noticed as the solution in cylinder is isotonic with respect to B.

47. C

**Sol:** Because mitochondria and chloroplasts contain DNA and ribosomes (protein synthesizing machinery)

48. C

**Sol:** Haptotropism is the movement in which plant moves or grow in response to touch or contact stimuli.

49. B

**Sol:** Because chemical signals are released from the axonal end of the neuron.

50. D

**Sol:** Because these organs have common organization and different functions.

51. A

**Sol:** Due to biomagnification the non-biodegradable pollutants retained in the body tissues.

52. B

**Sol:** Because unisexual flowers are those in which sexes are separate

53. B

**Sol:** Because of anaerobic respiration in muscles.

54. A

**Sol:** Urine formation occurs in kidney which enters into ureters and then into urinary bladder and comes out through urethra.**MATHEMATICS**

55. D

**Sol:**  $BD = 1 \text{ cm}$ 

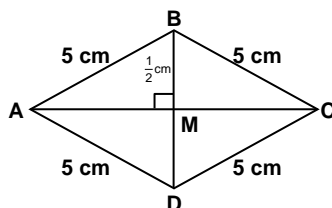
$$BM = \frac{1}{2} \text{ CM}$$

$$AM = \sqrt{5^2 - \left(\frac{1}{2}\right)^2}$$

$$= \frac{\sqrt{99}}{2} = \frac{3\sqrt{11}}{2}$$

$$AC = 2 AM = 3 \sqrt{11}$$

$$\text{Area of Rhombus} = \frac{1}{2}(AC)(BD) = \frac{1}{2}(3\sqrt{11}) \cdot 1 = \frac{3(3.32)}{2} = \frac{9.92}{2} = 4.96 \text{ cm}^2$$



56. **C (Rs. should be omitted from options)**

**Sol:** 12 oranges sales price= 1Rs

$$1 \text{ orange sales price} = \frac{1}{12} \text{Rs}$$

$$\text{S. P of one orange} = \frac{1}{12} \text{Rs}$$

Loss = 20%

Cp =

If SP is 80 Rs. then CP = 100 Rs.

$$\text{If SP is Rs. 1 then CP} = \frac{100}{80} \text{Rs.}$$

$$\text{If SP is Rs. } \frac{1}{12} \text{ then CP} = \frac{5}{48} \text{Rs.}$$

$$\text{For 20\% gain S.P of one orange} = \frac{5}{48} \times \frac{120}{100} = \frac{1}{8} \text{Rs.}$$

In Rs.1, He should sell 8 oranges

57.

**Sol: (Given Options are incorrect)**

$$T_n = S_n - S_{n-1}$$

$$= \frac{3n^2}{2} + \frac{5n}{2} - \left( \frac{3(n-1)^2}{2} + 5 \left( \frac{n-1}{2} \right) \right)$$

$$T_n = 3n + 1$$

$$T_{25} = 25(3) + 1 = 76$$

58. **A**

**Sol:** Total days 366

$$n(E) = 2$$

$$n(S) = 7$$

SM, MT, TW, WTh, ThF, FS, SS

$$P(E) = \frac{n(E)}{n(S)} = \frac{2}{7}$$

59. **B**

**Sol:**  $A + B = 90^\circ$

$$\frac{\tan A \tan(90^\circ - A) + \tan A \cot(90^\circ - A)}{\sin A \sec(90^\circ - A)} = \frac{\sin^2(90^\circ - A)}{\cos^2 A}$$

$$\Rightarrow \frac{\tan A \cot A + \tan A \tan A}{\sin A \operatorname{cosec} A} = \frac{\cos^2 A}{\cos^2 A}$$

$$\Rightarrow 1 + \tan^2 A = 1$$

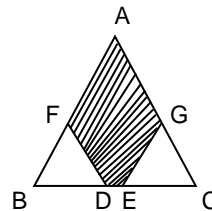
$$= \tan^2 A = \tan^2(90^\circ - B) = \cot^2 B$$

60. **B**

**Sol:** Area of unshaded portion =  $2 \left( \frac{\sqrt{3}}{4} x^2 \right)$

$$\text{Area of } \triangle ABC = \frac{\sqrt{3}}{4} (3x)^2$$

$$\frac{\text{Area of Shaded portion}}{\text{area of } \triangle ABC} = \frac{\frac{\sqrt{3}}{4} (9x^2 - x^2)}{\frac{\sqrt{3}}{4} (9x^2)} = \frac{7}{9}$$



$$AF = AG = 2x$$

$$BF = BD = FD = EC = CG = EG = DE = x$$

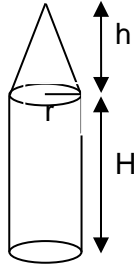
61. B

Sol:

Volume of solid = 3 volume of cone

$$\pi r^2 H + \frac{1}{3} \pi r^2 h = 3 \left( \frac{1}{3} \pi r^2 h \right)$$

$$H = \frac{2h}{3}$$



62. B

Sol:

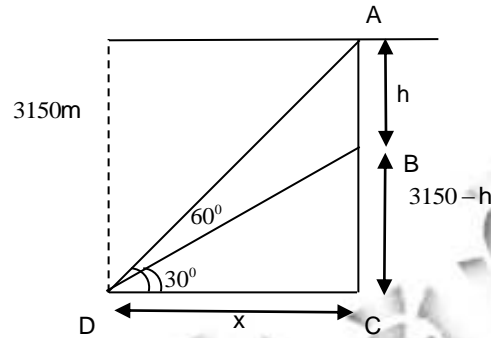
$$\frac{3150}{x} = \tan 60^\circ = \sqrt{3} \dots\dots 1$$

$$\frac{3150-h}{x} = \tan 30^\circ = \frac{1}{\sqrt{3}} \dots\dots 2$$

$$\Rightarrow \frac{3150}{3150-h} = 3 \Rightarrow 3150 = 9450-3h$$

$$3h = 6300$$

$$H = 2100 \text{ m}$$



63. D

Sol:

$$SI = \frac{P \times 8 \times 2}{100}$$

$$CI = P \left( 1 + \frac{8}{100} \right)^2 - P$$

$$= \left( \frac{27}{25} \frac{27}{25} - 1 \right) P$$

$$CI - SI = 6.40 \text{ Rs.}$$

$$P \left( \frac{729-625}{625} \right) - P \left( \frac{4}{25} \right) = \frac{32}{5}$$

$$P \left( \frac{104-100}{625} \right) = \frac{32}{5} P$$

$$\Rightarrow P \times \frac{4}{625} = \frac{32}{5}$$

$$P = 1000 \text{ Rs.}$$

64. B

Sol:

a, b, c, d, e are in continuous proportion

$$\frac{a}{b} = \frac{b}{c} = \frac{c}{d} = \frac{d}{e} = x \text{ (say)}$$

$$d = ex$$

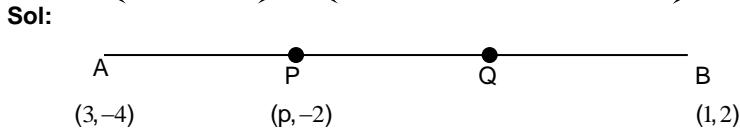
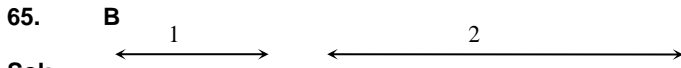
$$c = dx = ex^2$$

$$b = cx = ex^3$$

$$a = bx = ex^4$$

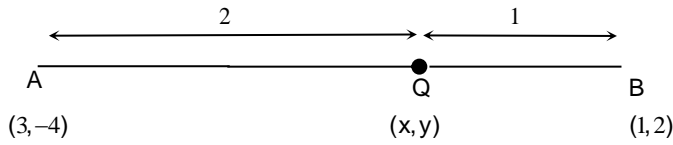
$$\Rightarrow \frac{a}{e} = x^4$$

$$\frac{a^4}{b^4} = x^4$$



$$\frac{1(1) + 2(3)}{3} = p \Rightarrow p = \frac{7}{3}$$

$$\frac{1(2) + 2(-4)}{3} = -2$$



$$Q\left(\frac{5}{3}, q\right)$$

Then  $q = 0$

$$x = \frac{2(1) + 1(3)}{3} = \frac{5}{3}$$

$$y = \frac{2(2) + 1(-4)}{3} = 0$$

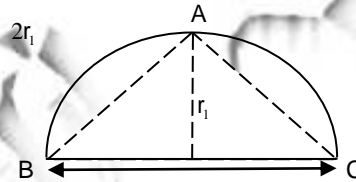
$$p = \frac{7}{3}, q = 0$$

66. **B**

**Sol:** For maximum area of  $\Delta ABC = \frac{1}{2}(2r_1) \cdot r_1$

$$r_1 = \frac{r}{16}$$

$$\text{maximum area of } \Delta ABC = \frac{r^2}{256}$$



67. **D**

**Sol:**  $x + y + z = 0$   $x \neq 0, y \neq 0, z \neq 0$

$$\frac{x^2}{yz} + \frac{y^2}{xz} + \frac{z^2}{xy} = \frac{x^3 + y^3 + z^3}{xyz}$$

of  $x + y + z = 0$  then  $x^3 + y^3 + z^3 = 3xyz$

$$\Rightarrow \frac{x^3 + y^3 + z^3}{xyz} = 3$$

68. **D**

**Sol:**

$$x^2 + y^2 + z^2 = r^2$$

$$x = r \cos a \cos b$$

$$y = r \cos a \sin b$$

$$\Rightarrow r^2 \cos^2 a \cos^2 b + r^2 \cos^2 a \sin^2 b + z^2 = r^2$$

$$r^2 \cos^2 a (\cos^2 b + \sin^2 b) + z^2 = r^2$$

$$r^2 \cos^2 a + z^2 = r^2$$

$$z^2 = r^2 (1 - \cos^2 a)$$

$$z^2 = r^2 \sin^2 a$$

$$\Rightarrow z = r \sin a$$



69. A

Sol:  $\alpha$  and  $\beta$  are roots of equation  $3x^2 - 5x + 3 = 0$

$$\alpha + \beta = \frac{5}{3}$$

$$\alpha\beta = 1$$

Equation of roots whose roots are  $\alpha^2$  and  $\beta^2$  is  $x^2 - Sx + P = 0$

$$S = \alpha^2\beta + \alpha\beta^2 = \alpha\beta(\alpha + \beta) = \frac{5}{3}$$

$$P = \alpha^2\beta \cdot \alpha\beta^2 = (\alpha\beta)^3 = 1^3 = 1$$

$$x^2 - \frac{5}{3}x + 1 = 0$$

$$3x^2 - 5x + 3 = 0$$

70. B

Sol:  $\ell + b + h = 19$   $(\ell + b + h)^2 = 361$

$$\sqrt{\ell^2 + b^2 + h^2} = 5\sqrt{5} \quad \ell^2 + b^2 + h^2 + 2(\ell b + bh + \ell h) = 361$$

$$\Rightarrow \ell^2 + b^2 + h^2 = 125 \quad 125 + 2(\ell b + bh + \ell h) = 361$$

$$\Rightarrow 2(\ell b + bh + \ell h) = 236 \text{ cm}^2$$

71. C

Sol:  $r$  is inradius of circle whose sides 12, 10, 10

$$r = \frac{\Delta}{s} = \frac{48}{16} = 3$$

$$2s = 32$$

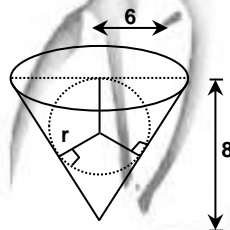
$$s = 16$$

$$\Delta = \sqrt{16 \cdot 4 \cdot 6 \cdot 6}$$

$$\text{Water over flowed} = 6.8 = 48 \text{ cm}^3$$

$$= \text{volume of sphere} = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi(3)^3 = 36\pi \text{ cm}^3$$

$$= \frac{\text{water over flowed}}{\text{water filled in conical vessel}} = \frac{3}{8}$$



72. C

Sol:  $r = \frac{\Delta}{s} = \frac{\frac{1}{2}ab}{\frac{1}{2}(a+b+c)}$

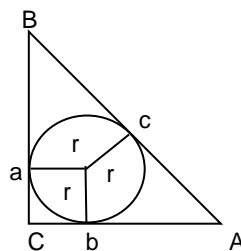
$$= \frac{ab}{(a+b+c)}$$

$$= \frac{ab(a+b-c)}{(a+b+c)(a+b-c)}$$

$$= \frac{ab(a+b-c)}{((a+b)^2 - c^2)}$$

$$= \frac{a+b-c}{2}$$

$$\therefore a^2 + b^2 = c^2$$



73. B

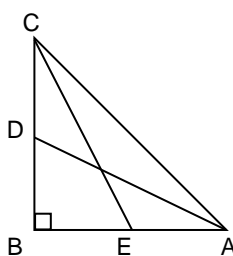
Sol:  $AD = \frac{3\sqrt{5}}{2}$

$$CE = 2\sqrt{5}$$

In  $\triangle BDA$   
 $BD^2 + BA^2 = AD^2$   
 $\frac{BC^2}{4} + BA^2 = \frac{45}{4}$   
 $BC^2 + 4BA^2 = 45 \dots 1$

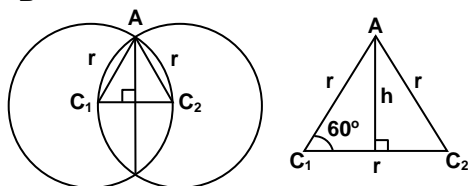
In  $\triangle CBE$   
 $(BC)^2 + (BE)^2 = (CE)^2$   
 $BC^2 + \frac{AB^2}{4} = 20$   
 $4BC^2 + AB^2 = 80 \dots 2$

Solving eq. No. 1 & 2  
 $AB^2 = \frac{20}{3}, BC^2 = \frac{55}{3}$   
 $AB^2 + BC^2 + AC^2$   
 $AC = 5$



74. B

Sol:



$$\frac{h}{r} = \sin 60^\circ$$

$$h = \frac{\sqrt{3}}{2}r$$

$$\text{Length of common chord} = 2h = \sqrt{3}r$$

$$\frac{\text{Length of common chord}}{\text{radius of circle}} = \frac{\sqrt{3}r}{r} = \frac{\sqrt{3}}{1}$$

**CHEMISTRY**

75. C

Sol: As gold has maximum malleability

76. C

Sol: When carbon dioxide is passed through lime water which is a diluted solution of  $\text{Ca(OH)}_2$ , it turns milky due to the formation of calcium carbonate which is  $\text{CaCO}_3$ 

77. B

Sol: B is the correct answer =  $\text{Na} > \text{Mg} > \text{Al} > \text{Si} > \text{Cl}$ . Along the period, metallic character decreases, all elements belong to period-3. This question is directly from class tenth NCERT exemplar problems.

78. C

Sol: The correct ans is C because gases can be liquified at low temperatures and high pressure. Non ideal gases are only liquefiable.

84. C

Sol: Bismuth alone does not exist with allotropy. Whereas all the elements in 15<sup>th</sup> group of periodic table show allotropy due to its variable oxidation state. Bismuth due to its inert pair effect does not exist variable oxidation state.

85. D

**Sol:** Tea contains tannic acid, which becomes bitterer as the tea is steeped. Depending on the type, tea a pH ranging from 4.0 to

6.0. Ginger tea and green tea are lowest in acidity.

86. D

**Sol:** Due to maximum electronegativity.

**PHYSICS**

87. A

**Sol:**  $\sqrt{\frac{2h}{g}} = T \therefore \sqrt{\frac{2\Delta h}{g}} = \frac{T}{3}$

$$\Delta h = h/9$$

$\therefore$  height  $\frac{8h}{9}$  from ground.

88. C

**Sol:**  $K = \frac{p^2}{2m}$

$$\frac{p_1^2}{p_2^2} = \frac{m_1 k_1}{m_2 k_2} = \frac{16}{1}$$

89. B

**Sol:** Power =  $\frac{dm}{dt} gh$

$$= 75 \text{ kw}$$

90. B

**Sol:**  $\Delta p = F\Delta t = \text{area of graph} = 0$

91. D

**Sol:**  $R = \rho \frac{L}{A} = \frac{\rho L^2}{\text{volume}}$

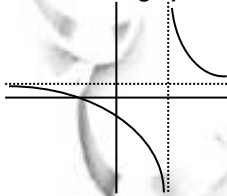
$$L \rightarrow 2L, R \rightarrow 4R$$

Increase is 300%

92. C

**Sol:**  $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$

u - v graph is



93. C

Sol:  $B_{\text{coil}} = \frac{\mu_0 NI}{2R}$

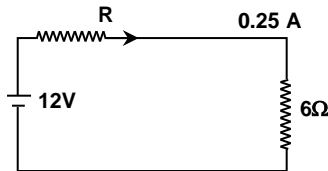
$$\frac{B_1}{B_2} = \frac{\frac{1}{d_1}}{\frac{1}{d_2}} = \frac{d_2}{d_1} = 2 : 1$$

94. A

Sol:  $\lambda_{\text{glass}} = \frac{\lambda_{\text{vacuum}}}{\mu_{\text{glass}}} = \frac{5460 \text{ \AA}}{1.5} = 3640 \text{ \AA}$

95. A

Sol: Equivalent circuit is  
 $12 \text{ V} = 0.25 (6 + R)$   
 $(R = 42 \Omega)$

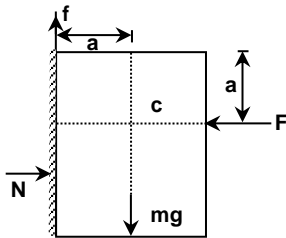


96. D

Sol: Slope of graph = velocity

97. D

Sol: N does not pass through centre and produce torque.

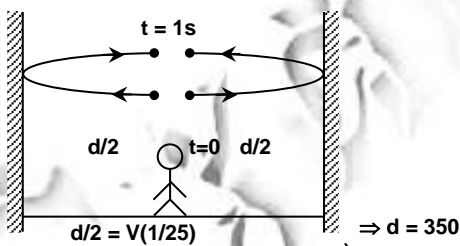


98. A

Sol: Thermal radiations transfer energy from hot to cold body in vacuum.

99. B

Sol:  $d = v \Delta t = 350 \text{ m}$



100. B

Sol:  $T = 2\pi \sqrt{\frac{L}{g}}$

As water leaks out centre of mass falls initially and finally again returns to centre. L increases first and then decreases T. Increases first and then decreases.