



NSAT-2025

CLASS – X (Mental Ability, Mathematics, Physics, Chemistry & Biology)
(Class X Moving to XI)

NARAYANA SCHOLASTIC APTITUDE TEST (NSAT)

SAMPLE PAPER

Time: 2:00 Hr.

Maximum marks: 300

IMPORTANT INSTRUCTIONS:

1. The test Booklet consists of 75 questions. The maximum marks are 300.
2. There are five parts in the question paper of MAT (Q. No. 1 to 15) Mathematics (Q. No. 16 to 30), Physics (Q. No. 31 to 45), Chemistry (Q. No. 46 to 60) & Biology (Q. No. 61 to 75) having 75 questions. Each question is allotted +4 (four) marks for each correct response & –1 for each incorrect answer
3. Mark only one correct answer out of four alternatives.
4. Use Blue/Black Ball Point Pen only for writing particulars/markings.
5. Use of Calculator is not allowed.
6. Dark the circle in the space provided only.
7. Use of white fluid or any other material which damage the answer sheet, is not permissible on the Answer Sheet.

TO BE FILLED IN CAPITAL LETTERS

NAME OF THE STUDENT: _____

FATHER'S NAME: _____

CONTACT NUMBERS: _____ SCHOOL NAME : _____

ROLL NO.: _____ TEST CENTRE : _____

have read all the instructions and shall abide by them

.....

Signature of the Candidate

I have verified all the information filled in by the Candidate

.....

Signature of the Invigilator



EDUCATION IS INTEGRAL FOR GROWTH AND DEVELOPMENT

Education is integral for the growth and development of an individual. The expectation from an educational institute is always about making the society better for all and to bring out one's true Potential in the service of mankind.

At Narayana, we believe that a student's education is complete only when we are able to contribute towards his/her overall development besides imparting knowledge based and career oriented training.

With an aim to provide top of the league training to students to excel in every sphere of their lives, Narayana Group has been focusing on result oriented inputs.

Narayana's courses have been designed to cater to all the needs of the aspirants to help them excel in various competitive as well as Board examinations. Innovative strategies and techniques adopted in our centres keep our students abreast of the ever-changing pattern of top level Engineering/Medical Entrance Exams. As a result, Narayana's time-tested learning formulae are percolating to far-flung corners of India to benefit students from all backgrounds.

"Footprints on the sands of time are not made by sitting down". Today we rededicate the last 4 decades of our success to your dreams. I wish all our students a very successful academic year ahead.

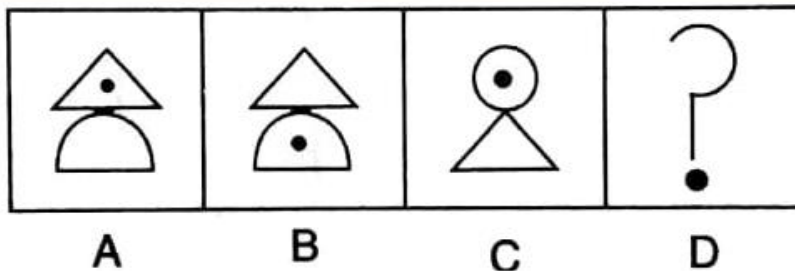
Dr. P. NARAYANA

Founder, Narayana Group

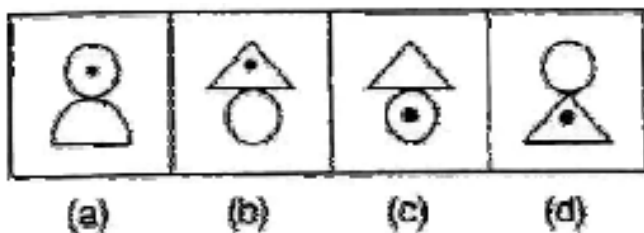
MENTAL ABILITY

1. It was Sunday on Jan 1, 2006, what was the day of the week on Jan 1, 2010?
 (1) Sunday (2) Saturday (3) Friday (4) Wednesday
2. What was the day of the week on 28th May, 2006 ?
 (1) Thursday (2) Friday (3) Saturday (4) Sunday
3. Choose the one which is different from the others.
 (1) 65 (2) 126 (3) 26 (4) 344
4. Mathematics is related to numbers in the same way as History is related to _____.
 (1) People (2) Events (3) Dates (4) Wars
5. If PAINT is coded as 74128 and EXCEL is coded as 93596, then how would you decode ACCEPT?
 (1) 455978 (2) 547978 (3) 554978 (4) 735961
6. The following question consists of two sets of figures. Figures A, B, C and D constitute the problem set while figures (a), (b), (c) (d) constitute the answer set. There is a definite relationship between figures A and B. Establish a similar relationship between figures C and D by choosing a suitable figure D from the answer set.

Problem Figures



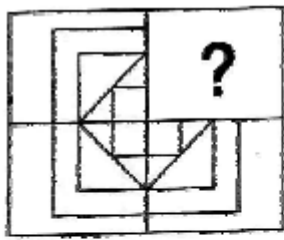
Answer Figures



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

Space for rough work

7. In the following question, complete the missing portion of the given pattern by selecting from the given alternatives (a), (b), (c) and (d).



(X)



(a)

(b)

(c)

(d)

- (1) (a) (2) (b) (3) (c) (4) (d)
8. Complete the pattern:
 $372 : 124 :: ? : ?$
 (1) $81 : 243$ (2) $900 : 450$ (3) $624 : 208$ (4) $513 : 161$
9. Choosing a number related to a given number in the same manner as the two numbers of another given pair are related to each other.
 $48 : 122 :: 168 : ?$
 (1) 215 (2) 225 (3) 290 (4) 292
10. Find the odd letters sequence from the given option
 (1) E29Y (2) H20L (3) N31Q (4) B25W
11. Select the related word from the given options. ADULT : BAB :: FLOWER : _____
 (1) seed (2) Bud (3) Fruit (4) Butterflies
- Direction :** A, B, C, D, E and F are six persons travelling together in a boat. Three of them B, C and E are women and the rest are men. However A, B, C and E are all vegetarian and D and F are non vegetarian. Finally, B, E and F know swimming while the rest do not know how to swim.
12. In a group, who is the non vegetarian male who does not know swimming?
 (1) D (2) F (3) A (4) E

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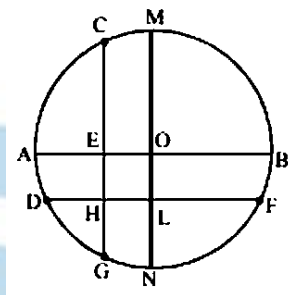
13. Find the odd letters sequence from the given option
(1) HKI (2) UXV (3) CFD (4) MQN
14. In CLOCK is KCOLC, how will STEPS be written in that code?
(1) SPEST (2) SPSET (3) SPETS (4) SEPTS
15. Select an appropriate term that completes the series
G, J, M, P, S, V, ?
(1) W (2) Z (3) X (4) Y

MATHEMATICS

16. Which of the following is not an irrational number?
(1) $\sqrt{2}$ (2) π (3) 0.101101110.. (4) $\frac{3}{5}$
17. If, $x = y^a$, $y = z^b$, $z = x^c$, then the value of abc is
(1) 0 (2) 1 (3) 2 (4) 3
18. If the polynomial $p(x) = 3x^3 - 9x^2 + 2x + 4$ is divided by $(x - 2)$ then remainder is -
(1) -4 (2) 4 (3) 14 (4) -12
19. The value of $\sin^2 10^\circ + \sin^2 20^\circ + \sin^2 30^\circ + \dots + \sin^2 90^\circ$ is
(1) 1 (2) 3 (3) 9 (4) 5
20. In a triangle ABC, D lies on AB, E lies on AC. If $DE \parallel BC$, $AD = 2.4$ cm, $AE = 3.2$ cm, $CE = 4.8$ cm. The value of BD is -
(1) 3.6 cm (2) 4.2 cm (3) 4.0 cm (4) 2.1 cm
21. The HCF of the smallest prime number and the smallest composite number is -
(1) 2 (2) 1 (3) 3 (4) 4
22. The point on the x-axis which is equidistant from the point $(-1, -2)$ and $(3, 4)$ is -
(1) $\left(\frac{3}{2}, 0\right)$ (2) $\left(\frac{5}{2}, 0\right)$ (3) $\left(\frac{7}{2}, 0\right)$ (4) $\left(0, \frac{5}{2}\right)$
23. The total number of integers between 0 and 1000 which is multiple of 30 is -
(1) 31 (2) 32 (3) 33 (4) 34
24. PQR is a triangle right angled at P and M is a point on QR such that $PM \perp QR$, then PM^2 is equal to -
(1) $QM \cdot MR$ (2) $PR \cdot PQ$ (3) $PR \cdot PM$ (4) $PM \cdot PQ$

Space for rough work

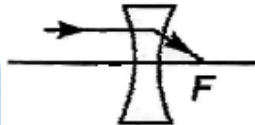
25. If the mean of the squares of first n natural numbers is 105, then find the median of the first n natural numbers.
- (1) 11 (2) 10 (3) 9 (4) 8
26. If the degree of the polynomial $7x^2 y^9 z^k$ is 20, then the value of k is
- (1) 9 (2) 11 (3) 8 (4) 20
27. In the following figure, the diameter of circle is 3 cm. AB and MN are two diameters such that MN is perpendicular to AB . In addition, CG is perpendicular to AB such that $AE : EB = 1 : 2$ and DF is perpendicular to MN such that $NL : LM = 1:2$. The length of DH in cm is




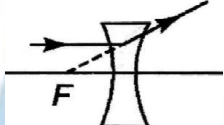
- (1) $2\sqrt{2} - 1$ (2) $\frac{(2\sqrt{2} - 1)}{2}$ (3) $\frac{(3\sqrt{2} - 1)}{2}$ (4) $\frac{(2\sqrt{2} - 1)}{3}$
28. What is the formula for Heron's formula to calculate the area of a triangle?
- (1) $\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$ (2) $\text{Area} = s(s-a)(s-b)(s-c)$
- (3) $\text{Area} = \left(\frac{1}{2}\right) \times \text{base} \times \text{height}$ (4) $\text{Area} = s(s-a)(s-b)$
29. In the class intervals 10-20, 20-30, the number 20 is included in
- (1) 10-20 (2) 20-30 (3) Both the intervals (4) None of these
30. If a cube of maximum possible volume is cut off from a solid sphere of diameter d , then the volume of the remaining (waste) material of the sphere would be equal to
- (1) $\frac{d^3}{3} \left(\pi - \frac{d}{2} \right)$ (2) $\frac{d^3}{3} \left(\frac{\pi}{2} - \frac{1}{\sqrt{3}} \right)$
- (3) $\frac{d^3}{4} (\sqrt{2} - \pi)$ (4) None of these


Space for rough work

PHYSICS

31. A boy is standing in front of a plane mirror at a distance of 3 m from it. What is the distance between the boy and his image?
- (1) 3 m (2) 4.5 m (3) 6 m (4) None of these
32. Which of the following colours is scattered minimum?
- (1) Violet (2) Yellow (3) Blue (4) Red
33. Which of the following diagrams correctly represents the passage of a ray of light through a concave lens?
- (1) 

(3) 

(2) 

(4) 
34. Position of object when concave mirror form virtual image
- (1) Between F & C (2) Between F and P (3) At F (4) At C
35. Unit of Power of lens is?
- (1) Unitless (2) Dioptre (3) m (4) Candela
36. What is SI unit of force ?
- (1) kg mg s⁻² (2) kg m s⁻¹ (3) Nm (4) N
37. If mass of body is doubled and velocity becomes half- linear momentum of body will be
- (1) Double (2) Remains same (3) becomes half (4) four time
38. Focal length of plane mirror :
- (1) +ve (2) -ve (3) infinity (4) zero
39. Two spherical balls of mass 10 kg each are placed 10 m apart. Find gravitation force of attraction between them ($G = 6.67 \times 10^{-11} \text{ m}^3 \text{ kg}^{-1} \text{ sec}^{-1}$)
- (1) $6.67 \times 10^{-13} \text{ N}$ (2) $6.67 \times 10^{+13} \text{ N}$ (3) $6.67 \times 10^{-11} \text{ N}$ (4) 6.67 N

Space for rough work

40. What type of sound waves are produced by a vibrating guitar string?
(1) Longitudinal waves (2) Transverse waves (3) EM waves (4) None of these
41. What happens to the kinetic energy of an object when its velocity is doubled?
(1) It remains the same (2) It is doubled
(3) It is quadrupled (4) It is halved
42. What is the unit of work?
(1) J (2) W (3) N (4) m
43. Structure that alter curvature of eye lens ?
(1) Ciliary muscle (2) optic nerve (3) Iris (4) Puppis
44. 3rd most deviated light after dispersion of white light is :
(1) Yellow (2) Blue (3) Indigo (4) Green
45. A convex lens of focal length 'a', a concave lens of focal length 'a' and a glass slab are combined, resultant power will be
(1) 0 (2) 2a (3) -2a (4) ∞

CHEMISTRY

46. What is the correct order of reactivity of metals?
(1) $K < Na < Fe < Zn$ (2) $K > Na > Zn > Fe$
(3) $Na < K < Fe < Zn$ (4) $Na < Fe < K < Zn$
47. How many electrons are occupied in the M- shell ?
(1) 8 (2) 18 (3) 16 (4) 32
48. Which non-metal is used in the production of fertilizers?
(1) Hydrogen (2) Nitrogen (3) Oxygen (4) Carbon
49. What is the symbol of iron?
(1) Mg (2) Al (3) Fe (4) Au
50. ${}^7N^{15}$ and ${}^{16}O$ are pair of ____
(1) Isotopes (2) Isobars (3) Isotones (4) none of these
51. What type of reaction is represented by the equation : $Mg + 2HCl \rightarrow MgCl_2 + H_2$
(1) Combination (2) Decomposition
(3) Single displacement (4) Double displacement

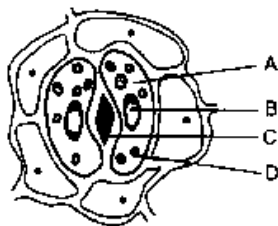
Space for rough work

52. Which acid is present in vinegar?
- (1) Citric acid (2) Sulfuric acid
(3) Hydrochloric acid (4) Acetic acid
53. Which of the following would weight the Hight ?
- (1) 0.2 mole of sucrose [$C_{12}H_{22}O_{11}$]
(2) 2 mole of CO_2
(3) 2 mole of $CaCO_3$
(4) 10 mole of H_2O
54. What is the chemical formula of aluminium sulphate?
- (1) Al_2SO_4 (2) Al_3SO_4 (3) $Al_2(SO_4)_3$ (4) $Al_3(SO_4)_2$
55. Which of the following is weak monoacidic base?
- (1) NaOH (2) NH_4OH (3) KOH (4) $Mg(OH)_2$
56. Bauxite is an ore of?
- (1) Aluminium (2) Zinc (3) Copper (4) Iron
57. Which of the following has maximum number of atom ?
- (1) 18 gm of H_2O (2) 18 gm of O_2 (3) 18 gm of CO_2 (4) 18 gm of CH_4
58. Among the following, which reaction is feasible :
- (1) $Mg(s) + CuSO_4(aq) \rightarrow MgSO_4(aq) + Cu(s)$
(2) $Cu(s) + ZnSO_4(aq) \rightarrow CuSO_4(aq) + Zn(s)$
(3) $Na(s) + KCl(aq) \rightarrow NaCl(aq) + K(s)$
(4) $Fe(s) + ZnSO_4(aq) \rightarrow FeSO_4(aq) + Zn(s)$
59. What is pH of neutral solution at $25^\circ C$?
- (1) pH = 7 (2) pH > 7 (3) pH < 7 (4) pH = 14
60. What type of ions do metals generally form ?
- (1) Anions (2) Neutrons (3) Cations (4) Isotopes

Space for rough work

BIOLOGY

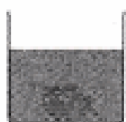
61. Observe the given diagram and find out incorrect sentence from the given options.



- (1) Part labelled as 'A' is cytoplasm of the guard cells.
 (2) Part labelled as 'C' is responsible for the gaseous exchange.
 (3) Given diagram shows a structure of stomata and it is present only on the surface of roots of terrestrial plants.
 (4) Given diagram shows open stoma which allows the process of transpiration in plants.
62. Iodine test is performed to check the presence of starch in the leaf. Given figure shows the steps of iodine test, select the option which shows correct sequence of the steps.



Leaf in boiling water
(i)



Leaf in iodine solution
(ii)



Leaf in alcohol heated in a water bath
(iii)

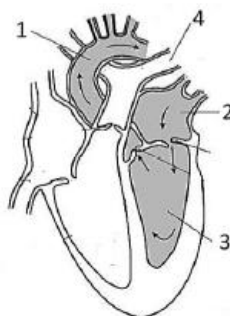


Leaf in water at room temperature
(iv)

- (1) (i) → (iii) → (iv) → (ii)
 (3) (i) → (ii) → (iv) → (iii)

- (2) (i) → (ii) → (iii) → (iv)
 (4) (iv) → (i) → (iii) → (ii)

63. Select the correct statement :

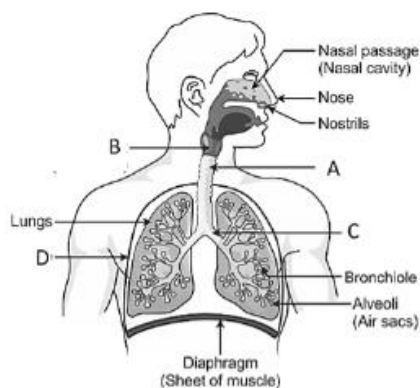


Space for rough work

- (1) 1-carries oxygenated blood to other organs of the body
(2) 2-pumps deoxygenated blood to the lungs
(3) 3-have thicker walls
(4) 4-carry oxygenated blood from lungs to heart
(1) 1 & 4 (2) 3 & 4 (3) 2 & 4 (4) 1 & 3
64. Absorption of water by the roots in an example of:
(1) Active transport (2) Diffusion (3) Osmosis (4) Both 1&3
65. In which mode of nutrition an organism de-rives its food from the body of another living organism without killing it?
(1) Saprotrophic nutrition (2) Parasitic nutrition
(3) Holozoic nutrition (4) Autotrophic nutrition
66. Choose the combination of incorrect statements:
A) Arteries have thin and elastic walls
B) Veins have thin walls and have valves
C) Walls of capillaries are formed of multiple layers of cells
C) Platelets forms clotting plug to seal the leaks
(1) B & C (2) B only (3) A & C (4) A, C & D
67. Translocation of food in plants occurs through:
(1) Xylem (2) Phloem (3) Both 1 & 2 (4) Chloroplast
68. Resins and Gums in plants are:
(1) Respiratory products (2) Digestive products
(3) Excretory products (4) Assimilatory products
69. Which part of brain is the centre for muscle movement ?
(1) Pons (2) Medulla oblogata (3) Cerebellum (4) Hypothalamus

Space for rough work

70. Identify the part which prevent the collapsing of air passage in humans :



- (1) B (2) C (3) A (4) D
71. Which of the following act as a biofertilizer ?
 (1) Rhizobium (2) Nostoc (3) Anabena (4) All of these
72. Which of the following is a kharif crop ?
 (1) Wheat (2) Barley (3) Gram (4) Soyabean
73. Which hormone is responsible for the fight or flight response ?
 (1) Insulin (2) Thyroxine (3) Adrenaline (4) Oestrogen
74. Which hormone increases blood glucose levels by glycogenolysis ?
 (1) Insulin (2) Glucagon (3) Thyroxine (4) Melatonin
75. The end product of carbohydrate digestion is
 (1) Amino acids (2) Fatty acids (3) Monosaccharides (4) Glycerol

Space for rough work