Robo-champs OLYMPIAD

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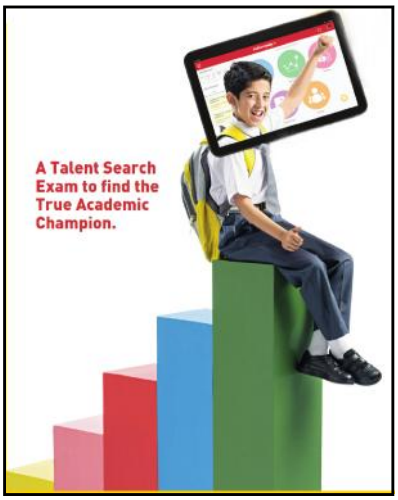

SAMPLE QUESTIONS

for

CLASS X

Name : _____

School Name : _____

Contact No. : _____

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INSTRUCTIONS

Time duration: 1:00 hr. (Time of OMR filling is included in time duration).

Maximum Marks: 240

This Paper contains 60 questions divided in two sections

Section–A	***Mental Aptitude***	***20 questions***	***80 marks***
Section–B	***Scholastic Aptitude***	***40 questions***	***160 marks***

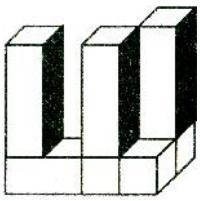
Each Question has a single correct answer.

Marking Scheme: +4 marks for correct answers.

There is **NO NEGATIVE MARKING** in Stage-I but it will be there in Stage-II as per NTSE Standard.

SECTION–A (MAT)
MENTAL APTITUDE

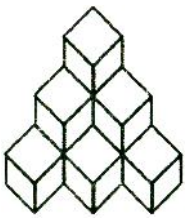
1. Count the number of blocks in the given figure.



(a) 6 (b) 7

(c) 8 (d) 9

2. Count the number of cubes in the given figure.



(a) 6 (b) 8

(c) 10 (d) 12

3. Count the number of cubes in the given figure.

(a) 8 (b) 9

(c) 12 (d) 15

4. A cube of white material is painted black on all its surfaces. If it is cut into 125 smaller cubes of the same size, then how many cubes will have two sides painted black ?

(a) 8 (b) 16

(c) 22 (d) 36

Directions (Q. 5 to 8) : A cube is painted red on two adjacent faces, yellow on the two faces opposite to the red faces and green on the remaining faces. It is then cut into 64 smaller cubes of equal size. Answer the following questions based on this information :

5. How many cubes are painted on all faces ?

(a) 16 (b) 8

(c) 4 (d) 0

6. How many cubes are there which have no face painted ?

(a) 24 (b) 16

(c) 8 (d) 4

7. How many cubes are painted yellow on the face only ?

(a) 4 (b) 8

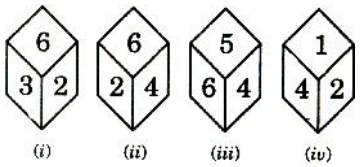
(c) 16 (d) 32

8. How many cubes have three faces painted ?

(a) 16 (b) 12

(c) 8 (d) 6

9. The four–different positions of a dice are given below :

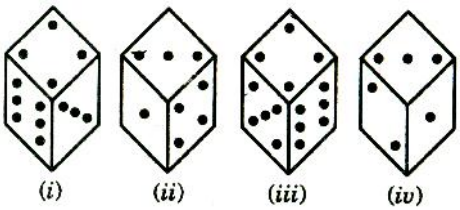


Which number is on the face opposite 6 ?

(a) 1 (b) 2

(c) 3 (d) 4

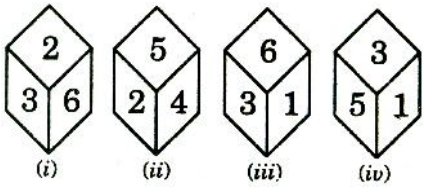
10. How many dots are there on the dice face opposite the one with three dots ?



(a) 2 (b) 4

(c) 5 (d) 6

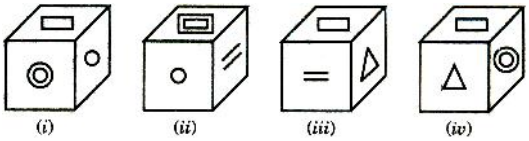
11. What number is opposite 3, if four different positions of a dics are as shown below ?



(a) 6 (b) 4

(c) 3 (d) 2

Directions (Q. no. 12 to 14) : are based on the following illustractions, which are four wiews of a cube.



12. The symbol at the bottom of (iv) is

(a) ○ (b) ◎

(c) △ (d) ▭

13. The symbol opposite the face having the symbol '═' is

(a) ○ (b) △

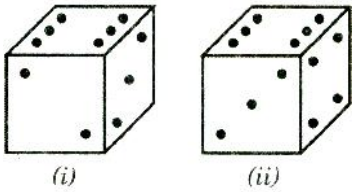
(c) ◎ (d) ▭

14. The symbol opposite the face having the symbol 'Δ' is

(a) ○ (b) ◎

(c) ═ (d) ▭

15. Two positions of a dice with 1 to 6 dots on its sides are shown below. If the dice is resting on the side with three dots, what will be the number of dots on the side at the top ?

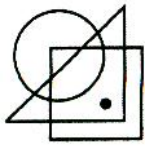


(a) 1 or 5 (b) 2

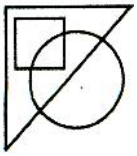
(c) 3 (d) 5

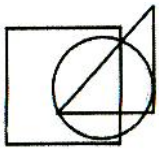
Directions (Q. no. 16 to 20) : In each of the following questions, from amongst the figures marked (a), (b), (c) and (d) select the one which satisfies the same conditions of placement of the dot as in figure (X).

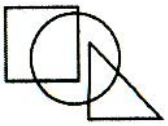
16.

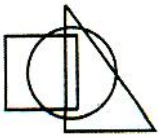


(X)

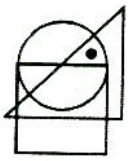
(a) 

(b) 

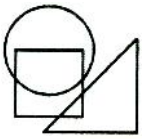
(c) 

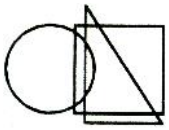
(d) 

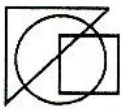
17.

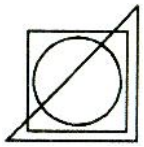


(X)

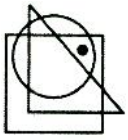
(a) 

(b) 

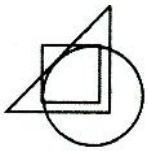
(c) 

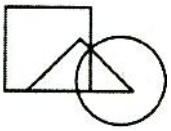
(d) 

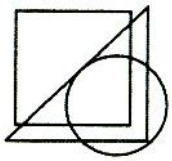
18.

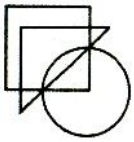


(X)

(a) 

(b) 

(c) 

(d) 

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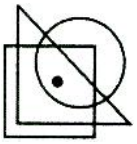
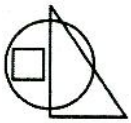
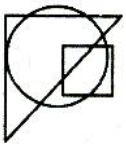
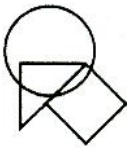
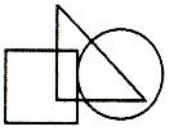


(X)

(a) 

(b) 

(c) 

(d) 

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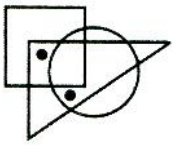
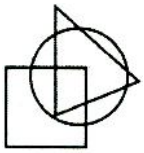
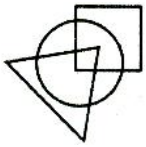
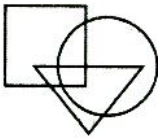
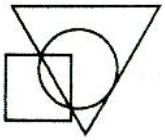


(X)

(a) 

(b) 

(c) 

(d) 

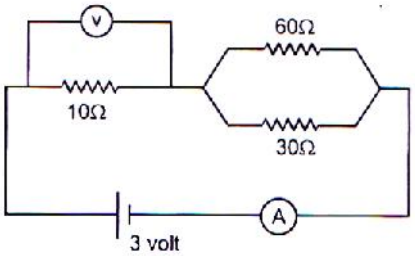
SECTION–B (SAT)
SCHOLASTIC APTITUDE TEST

21. A wire of resistance R is cut into five equal pieces. These pieces are connected in parallel and the equivalent resistance of the combination is R'. Then the ratio $\frac{R}{R'}$ is

(a) $\frac{1}{5}$ (b) 5

(c) $\frac{1}{25}$ (d) 25

22. In the circuit shown, reading of the ammeter and the voltmeter are respectively



(a) 0.1 amp., 3 volt

(b) 0.1 amp., 1 volt

(c) 0.3 amp., 3 volt

(d) 0.3 amp., 1 volt

23. A current of 4.8 A is flowing in a conductor. The number of electrons passing per second through the conductor will be

(a) 3×10^{20} (b) 76.8×10^{20}

(c) 7.68×10^{-19} (d) 3×10^{19}

24. In Coulomb's law, the constant of proportionality K has the units

(a) N (b) $N\ m^2$

(c) $N\ C^2\ m^{-2}$ (d) $N\ m^2\ C^{-2}$

25. If 10^{10} electrons are removed from a neutral body, the charge acquired by the body is

(a) $+1.6 \times 10^{-29}$ C (b) $+ 1.6 \times 10^{-9}$ C

(c) $- 1.6 \times 10^{-9}$C (d) $+10^{10}$ C

26. The equation

$$Cu + xHNO_3 \longrightarrow Cu(NO_3)_2 + yNO_2 + 2H_2O$$

The values of x and y are -

(a) 3 and 5 (b) 8 and 6

(c) 4 and 2 (d) 7 and 1

27. Hydrogen sulphide (H_2S) is a strong reducing agent. Which of the following reactions shows its reducing action -

(a) $Cd(NO_3)_2 + H_2S \longrightarrow CdS + 2HNO_3$

(b) $CuSO_4 + H_2S \longrightarrow CuS + H_2SO_4$

(c) $2FeCl_3 + H_2S \longrightarrow 2FeCl_2 + 2HCl + S$

(d) $Pb(NO_3)_2 + H_2S \longrightarrow PbS + 2CH_3COOH$

28. Reaction of zinc with dilute sulphuric acid is

(a) a displacement as well as redox reaction

(b) a precipitation reaction as well as redox reaction

(c) a redox reaction as well as double displacement reaction

(d) a decomposition reaction as well as combination reaction

29. Which of the following does not involve a chemical reaction ?

(a) digestion of food in our body

(b) process of respiration

(c) burning of candle wax when heated

(d) melting of candle wax on heating

30. In the process of respiration, glucose combines with oxygen in the cells of our body and a large amount of energy is ____*i*____. Hence, respiration is an ____*ii*____ process. The information in which alternative completes the given statements?

(a)

i	ii
released	endothermic

(b)

i	ii
absorbed	endothermic

(c)

i	ii
released	exothermic

(d)

i	ii
absorbed	exothermic

31. If $\sqrt{\frac{\left(4+\sqrt{x+3}\right)^2}{6}+3}=3$, then x is equal to:

(a) 22 (b) 6

(c) 3 (d) 1

32. The value of

$\left(1-\frac{1}{3}\right)^2\left(1-\frac{1}{4}\right)^2\left(1-\frac{1}{5}\right)^2$ ..... and $\left(1-\frac{1}{n}\right)^2$ is equal to:

(a) $\left(\frac{1}{n}\right)^2$ (b) $\left(\frac{2}{n}\right)^2$

(c) $\left(\frac{3}{n}\right)^2$ (d) $\left(\frac{4}{n}\right)^2$

33. The value of the digit d for which the number d456d is divisible by 18, is:

(a) 3 (b) 4

(c) 6 (d) 9

34. If a + 1 = b + 2 = c + 3 = d + 4 = a + b + c + d + 5, then (a + b + c + d) is equal to :

(a) –5 (b) $-\frac{10}{3}$

(c) –7/3 (d) 5/3

35. If $2^x = 3^y = 6^{-z}$, then $\left(\frac{1}{x}+\frac{1}{y}+\frac{1}{z}\right)$ is equal to:

(a) 0 (b) 1

(c) $\frac{3}{2}$ (d) $-\frac{1}{2}$

36. Let $x = (2008)^{1004} + (2008)^{-1004}$ and $y = (2008)^{1004} - (2008)^{-1004}$ then the value of $(x^2 - y^2)$ is equal to :

(a) 4 (b) –4

(c) 0 (d) none

37. If least prime factor of a number m is 3 and least prime factor of another number n is 7, then least prime factor of the number (m + n) is :

(a) 2 (b) 3

(c) 4 (d) 8

38. The zeros of the quadratic polynomial $x^2 + 88x + 125$ are

(a) both positive

(b) both negative

(c) one positive and one negative

(d) both equal

39. If the polynomial $(2x^3 + ax^2 + 3x - 5)$ and $(x^3 + x^2 - 2x + a)$ leave the same remainder when divided by (x – 2), then the value of a is

(a) 2 (b) – 2

(c) 3 (d) – 3

40. The HCF of a polynomials $70(x^3 - 1)$ and $105(x^2 - 1)$ is _____.

(a) $15(x - 1)$

(b) $35(x - 1)$

(c) $35\ (x^2 - 1)(x^2 + x + 1)$

(d) $15(x^2 - 1)$

41. If x, y, z be rational numbers such that $x > y$ and $z < y$ then

(a) $z > x$ (b) $z < x$

(c) $y < z$ (d) $y > x$

42. If $P = \frac{x+1}{x-1}$ and $Q = \frac{x-1}{x+1}$, then $P^2 + Q^2 - 2PQ$ = _____.

(a) $\frac{16x^2}{x^4 - 2x^2 + 1}$

(b) $\frac{4x^4 + 8x^2 + 4}{x^4 - 2x^2 + 1}$

(c) $\frac{4x^2}{x^4 + 2x^2 + 1}$

(d) $\frac{8x^2}{x^4 - 2x^2 + 1}$

43. If zeroes of the polynomial $f(x) = x^3 - 3px^2 + qx - r$ are in A.P., then

(a) $2p^3 = pq - r$

(b) $2p^3 = pq + r$

(c) $p^3 = pq - r$

(d) none of these

44. The graph of $y = x^3 - 4x$ cuts x – axis at (– 2, 0) (0, 0) and (2, 0). The zeroes of $x^3 - 4x$ are

(a) 0, 0, 0 (b) –2, 2, 2

(c) –2, 0, 2 (d) –2, –2, 2

45. If $x = 1 - \sqrt{2}$, then the value of $\left(x - \frac{1}{x}\right)^3$ is

(a) 8 (b) 4

(c) 2 (d) 1

46. Which of these is the simplest food?

(a) Rice (b) Wheat

(c) Butter (d) Glucose

47. One cell-thick vessels are called:

(a) Arteries

(b) Veins

(c) Capillaries

(d) Pulmonary artery

48. The World environment day is celebrated on:

(a) 5 July (b) 15 July

(c) 5 June (d) 15 June

49. If salivary amylase is lacking in the saliva, which of the following events in the mouth cavity will be affected?

(a) Proteins breaking down into amino acids

(b) Starch breaking down into sugars

(c) Fats breaking down into fatty acids and glycerol

(d) Absorption of vitamins

50. Pigmented layer in eye is called:

(a) Cornea (b) Pit Sclerotic

(c) Retina (d) All

51. Which of the following organisms is a saprophyte?

(a) Yeast (b) Ascaris

(c) Leech (d) Vulture

52. What prevents backflow of blood inside the heart during contraction?

(a) Valves in heart

(b) Thick muscular walls of ventricles

(c) Thin walls of atria

(d) All of the above

53. Which of the following is an incorrect statement?

(a) Organisms grow with time

(b) Organisms must repair and maintain their structure

(c) Movement of molecules does not take place among cells

(d) Energy is essential for life processes

54. Blood consist of what fluid medium?

(a) Lymph (b) Platelets
(c) Plasma (d) All of these

55. Which of the following type has the longest small intestine?

(a) Carnivores
(b) Omnivores
(c) Herbivores
(d) Autotroph

56. During respiration exchange of gases take place in:

(a) trachea and larynx
(b) alveoli of lungs
(c) alveoli and throat
(d) throat and larynx

57. In human each kidney has large numbers of filtration units called ___:

(a) Neutrons (b) Neurons
(c) Neptune (d) Nephrons

58. The transport of soluble products of photosynthesis is called translocation and it occurs in the part of the vascular tissue called:

(a) Xylem
(b) Sclerenchyma
(c) Phloem
(d) Collenchyma

59. The inner lining of stomach is protected by one of the following from hydrochloric acid. Choose the correct one:

(a) Pepsin (b) Mucus
(c) Salivary amylase (d) Bile

60. The opening and closing of the stomatal pore depends upon:

(a) oxygen
(b) temperature
(c) water in guard cells
(d) concentration of CO_2 in stomata

Dream on !!

SECTION–A (MAT)
MENTAL APTITUDE

1. (b)	**2.** (c)	**3.** (d)	**4.** (d)	**5.** (d)
6. (c)	**7.** (b)	**8.** (c)	**9.** (a)	**10.** (c)
11. (b)	**12.** (d)	**13.** (c)	**14.** (a)	**15.** (a)
16. (a)	**17.** (c)	**18.** (d)	**19.** (b)	**20.** (c)

SECTION–B (SAT)
SCHOLASTIC APTITUDE TEST

21. (d)	**22.** (b)	**23.** (d)	**24.** (d)	**25.** (b)
26. (c)	**27.** (c)	**28.** (a)	**29.** (d)	**30.** (c)
31. (d)	**32.** (b)	**33.** (c)	**34.** (b)	**35.** (a)
36. (a)	**37.** (a)	**38.** (b)	**39.** (d)	**40.** (b)
41. (b)	**42.** (a)	**43.** (a)	**44.** (c)	**45.** (a)
46. (d)	47. (c)	48.(c)	49. (b)	50. (c)
51. (a)	52. (a)	53. (c)	54. (c)	55. (c)
56. (b)	57. (d)	58. (c)	59. (b)	60. (c)