iQuest Scholastic & Mental Aptitude Reward Test

SAMPLE PAPER (NON-MEDICAL) FOR 11TH CLASS

Time: 1 Hr	Max Marks : 200

THE TEST CONSISTS OF TWO SECTIONS : (TOTAL 50 QUESTIONS)

SECTION A : MAT	**20 Questions**
SECTION B : SAT	**30 Questions**

INSTRUCTIONS TO CANDIDATE

- Each subject in this paper consists of multiple choice questions with only one correct answer. ***+4 marks*** will be awarded for correct answer and ***–1 mark*** for wrong answer.
- Please read the instructions given for each question carefully and fill the correct answer against the question numbers on the answer sheet in the respective subject.
- Use blue or black ball point pen or H.B. pencil to darken the appropriate circle & mark should completely fill the circle.
- The Question paper contains blank spaces for your rough work. No additional sheet will be provided for rough work.
- Blank papers, Clipboards, Log Tables, Slide rule, Calculators, Cellular phones, Pagers and Electronic gadgets in any form are not allowed.
- Write your Name, Roll Number in the block at the top of the Answer Sheet. Also write your Name & Registration No. in the space provided on this cover page of question paper.
- **This test paper is just an indicative of the actual test, The pattern of the actual test may vary.**

Name:_____Students ID:_____

SECTION - A (MAT)

Directions : (Q 1-3)Complete the series.

1. 5, 11, 24, 51, 106, ?

(A) 214 (B) 218
(C) 219 (D) 217

2. 4, 9, 13, 22, 35, –

(A) 57 (B) 70
(C) 63 (D) 75

3. adb _ ac _ da _ cddcb _ dbc _ cbda

(A) bccba (B) cbbaa
(C) ccbba (D) bbcad

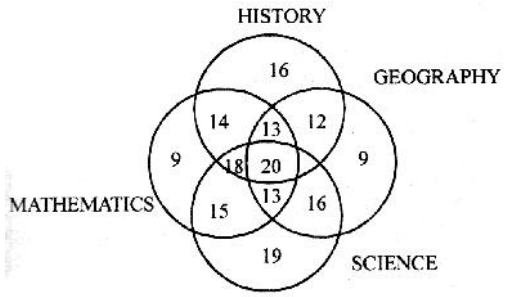
4. Find the odd-set in following question:

(A) 7, 4, 9 (B) 13, 36, 7
(C) 5, 25, 9, (D) 11, 16, 7

5. If A + D > C + E, C + D = 2B and B + E > C + D, it necessarily follows that

(A) A + B > 2D (B) B + D > C + E
(C) A + D > B + E (D) A + D > B + C

Directions :* (Q 6-8) *Refer to the following Venn diagram :



6. The number of students who took any three of the above subjects was

(A) 62 (B) 63
(C) 64 (D) 66

7. The number of students in total, who took History or Mathematics or Science, was

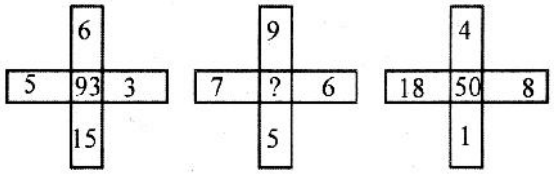
(A) 165 (B) 190
(C) 424 (D) 430

8. The number of students who took both History and Geography among other subjects was

(A) 62 (B) 45
(C) 65 (D) 66

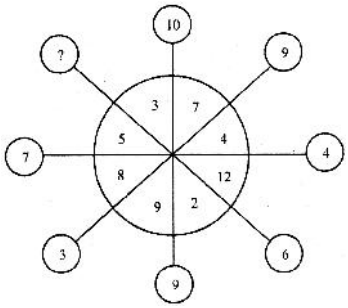
Directions :* (Q 9-10) *Find the missing number in the following questions:

9.



(A) 15 (B) 19
(C) 27 (D) 89

10.



(A) 12 (B) 13 (C) 14 (D) 15

Space for Rough work

Directions :* (Q 11) *In the question below consists of a question and two statements numbered I and II given below it. You have to decide whether the data provided in the statements are sufficient to answer the question. Read both the statements and give your answer as :

(A) if the data in statement I alone are sufficient to answer the question, while the data in statement II alone are not sufficient to answer the question.

(B) if the data in statement II alone are sufficient to answer the question, while the data in statement I alone are not sufficient to answer the question.

(C) if the data either in statement I alone or in statement II alone are sufficient to answer the question.

(D) if the data in both statements I and II together are necessary to answer the question.

11. Among Nitin, Amit, Sudesh, Rekha and Sujata, who came last for the programme?

I. Nitin came after Amit but not after Sujata.

II. Rekha came after Sujata but not after Sudesh.

12. Pushpa is twice as old as Rita was two years ago. If difference between their ages be 2 years, how old is Pushpa today?

(A) 6 years (B) 8 years
(C) 10 years (D) 12 years

Directions :* (Q 13-16)*Study the following information carefully and then answer the questions given below it

P, Q, R, S, T, W and Z are seven students studying in three different institutes - A, B and C. There are three girls among them studying one each in each of these institutes. Two of them study Mechanical Engineering, two study Medicine and one each study Biotechnology, Pharmacy and Electrical Engineering. R studies with only her best friend P who studies Pharmacy in college B. No girls studies either Biotechnology or Electrical Engineering. T studies Mechanical Engineering in college A and his brother W studies Electrical Engineering in college C. None of the two studying Medicines studies in college B. S studies Biotechnology along with T and Z.

13. In which of the college do three of them study?

(A) C (B) B
(C) A or C (D) None of these

14. Which of the following pairs of students study Medicine?

(A) S, Z (B) Z, W
(C) Z, Q (D) T, Q

15. Which of the following is the field of study of Z?

(A) Medicine (B) Mechanical
(C) Electrical (D) Data inadequate

16. Which of the following three represent the three girls?

(A) S, Z, Q (B) Z, R, Q
(C) S, R, Q (D) Data inadequate

Directions :* (Q-17)*In the question below are given two statements followed by two conclusions numbered I and II. You have to take the two given statements to be true even if they seem to be at variance from commonly known facts and decide which of the given conclusion(s) logically follow(s) from the two given statements, disregarding commonly known facts.

Space for Rough work

Given your answer as

(A) if only conclusion I follows

(B) if only conclusion II follows

(C) if either I or II follows

(D) if neither I nor II follows

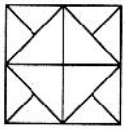
17. Statements : 1 All plants are trees.

2. No tree is green

Conclusions : I. Some plants are green.

II. Those plants which are not trees are green.

18. How many triangles are there in the following figure?



(A) 16 (B) 20

(C) 12 (D) 22

Directions :* (Q 19-20) *A cube is coloured red on two opposite faces, blue on two adjacent faces and yellow on two remaining faces. It is then cut into two halves along the plane parallel to the red faces. One piece is then cut into four equal cubes and the other one into 32 equal cubes.

19. How many cubes do not have any coloured faces?

(A) 0 (B) 16

(C) 4 (D) 8

20. How many cubes do not have any red faces?

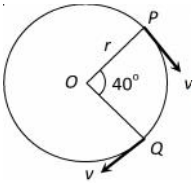
(A) 8 (B) 16

(C) 20 (D) 24

SECTION - B (SAT)

PHYSICS

21. A particle is moving on a circular path of radius r with uniform velocity v. The change in velocity when the particle moves from P to Q is $(\angle POQ = 40°)$



(A) $2v\cos 40°$ (B) $2v\sin 40°$

(C) $2v\sin 20°$ (D) $2v\cos 20°$

22. A ball of mass 0.1 kg is suspended by a string. It is displaced through an angle of 60^{o} and left. When the ball passes through the mean position, the tension in the string is

(A) 19.6 N (B) 1.96 N (C) 9.8 N (D) Zero

23. A block can slide on a smooth inclined plane of inclination $^{-}$ kept on the floor of a lift. When the lift is descending with a retardation a, the acceleration of the block relative to the incline is

(A) $(g+a)\sin^{-}$ (B) $(g-a)$

(C) $g\sin^{-}$ (D) $(g-a)\sin^{-}$

24. A wooden block of mass M rests on a horizontal surface. A bullet of mass m moving in the horizontal direction strikes and gets embedded in it. The combined system covers a distance x on the surface. If the

Space for Rough work

coefficient of friction between wood and the surface is « , the speed of the bullet at the time of striking the block is (where *m* is mass of the bullet)

(A) $\sqrt{\frac{2Mg}{«m}}$ (B) $\sqrt{\frac{2«mg}{Mx}}$

(C) $\sqrt{2«gx}\left(\frac{M+m}{m}\right)$ (D) $\sqrt{\frac{2«mx}{M+m}}$

25. A disc is rotating with angular velocity $\vec{\omega}$. A force $\vec{F}$ acts at a point whose position vector with respect to the axis of rotation is $\vec{r}$. The power associated with the torque due to the force is given by

(A) $(\vec{r}\times\vec{F}).\vec{\omega}$ (B) $(\vec{r}\times\vec{F})\times\vec{\omega}$

(C) $\vec{r}.(\vec{F}\times\vec{\omega})$ (D) $\vec{r}\times(\vec{F}.\vec{\omega})$

26. A wooden block of volume 1000 cm^3 is suspended from a spring balance. It weighs 12 *N* in air. It is suspended in water such that half of the block is below the surface of water. The reading of the spring balance is

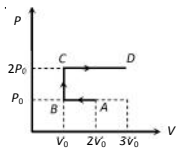
(A) 10 *N* (B) 9 *N* (C) 8 *N* (D) 7 *N*

27. A steel scale measures the length of a copper wire as $80.0\,cm$, when both are at $20°C$ (the calibration temperature for scale). What would be the scale read for the length of the wire when both are at $40°C$? (Given $\sim_{steel} = 11\times10^{-6}$ per$°C$ and $\alpha_{copper} = 17\times10^{-6}\,per\,°C$)

(A) $80.0096\,cm$ (B) $80.0272\,cm$

(C) $1\,cm$ (D) $25.2\,cm$

28. *P-V* diagram of an ideal gas is as shown in figure. Work done by the gas in process *ABCD* is



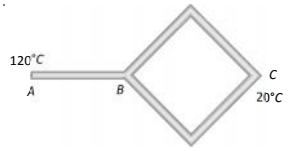
(A) $4\,P_0V_0$ (B) $2\,P_0V_0$ (C) $3\,P_0V_0$ (D) P_0V_0

29. An ideal gas $(¥ = 1.5)$ is expanded adiabatically. How many times has the gas to be expanded to reduce the root mean square velocity of molecules 2.0 times

(A) 4 times (B) 16 times

(C) 8 times (D) 2 times

30. Five identical rods are joined as shown in figure. Point *A* and *C* are maintained at temperature 120°*C* and 20°*C* respectively. The temperature of junction *B* will be



(A) 100°*C* (B) 80°*C*

(C) 70°*C* (D) 0°*C*

Space for Rough work

CHEMSITRY

31. Which of the following statement about LiCl and NaCl is correct?

(A) LiCl has higher melting point than NaCl

(B) LiCl dissolves in water whereas NaCl does not

(C) LiCl would ionize in water more than NaCl

(D) Fused LiCl would be less conducting than fused NaCl

32. The shape of XeF_4 is

(A) square pyramidal (B) square antiprismatic

(C) pyramidal (D) nearly linear

33. At 27^oC, one mole of an ideal gas is compressed isothermally and reversibly from a pressure of 2 *atm* to 10 *atm*. The values of ΔE and q are $(R = 2)$

(A) 0, – 965.84 *cal*

(B) – 965.84 *cal*, + 965.84 *cal*

(C) + 865.58 *cal*, – 865.58 *cal*

(D) – 865.58 *cal*, – 865.58 *cal*

34. For a reversible spontaneous change ΔS is

(A) $\frac{\Delta E}{T}$ (B) $\frac{P\,\Delta V}{T}$

(C) $\frac{q}{T}$ (D) $RT \log K$

35. The entropy changed involved in the conversion of 1 *mole* of liquid water at 373 *K* to vapour at the same temperature will be

$[\Delta H_{vap} = 2.257\,kJ/gm]$

(A) 0.119 *kJ* (B) 0.109 *kJ*

(C) 0.129 *kJ* (D) 0.120 *kJ*

36. Which of the following is an endothermic reaction

(A) $2H_2 + O_2 \rightarrow 2H_2O$ (B) $N_2 + O_2 \rightarrow 2NO$

(C) $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

(D) $3O_2 + C_2H_5OH \rightarrow 2CO_2 + 3H_2O$

37. $S + \frac{3}{2}O_2 \rightarrow SO_3 + 2x\,kcal$

$SO_2 + \frac{1}{2}O_2 \rightarrow SO_3 + y\,kcal$

Find out the heat of formation of SO_2

(A) $2x - y$ (B) $2x + y$ (C) $x + y$ (D) $2x / y$

38. For the reaction $A + 2B \rightleftharpoons C$, the expression for equilibrium constant is

(A) $\frac{[A][B]^2}{[C]}$ (B) $\frac{[A][B]}{[C]}$

(C) $\frac{[C]}{[A][B]^2}$ (D) $\frac{[C]}{2[B][A]}$

39. 4.5 moles each of hydrogen and iodine heated in a sealed ten litre vessel. At equilibrium, 3 moles of HI were found. The equilibrium constant for $H_2(g) + I_2(g) \rightleftharpoons 2HI(g)$ is

(A) 1 (B) 10 (C) 5 (D) 0.33

Space for Rough work

40. For the chemical reaction $3X(g) + Y(g) \rightleftharpoons X_3Y(g)$, the amount of X_3Y at equilibrium is affected by

(A) Temperature and pressure

(B) Temperature only

(C) Pressure only

(D) Temperature, pressure and catalyst

MATHEMATICS

41. It is known that $\sum_{r=1}^{\infty} \frac{1}{(2r-1)^2} = \frac{\pi^2}{8}$ then $\sum_{r=1}^{\infty} \frac{1}{r^2}$ is equal to

(A) $\frac{\pi^2}{24}$ (B) $\frac{\pi^2}{3}$ (C) $\frac{\pi^2}{6}$ (D) none of these

42. The number of real roots of the equation $e^{\sin x} - e^{-\sin x} - 4 = 0$ is

(A) 2 (B) 1

(C) infinite (D) None of these

43. The number of irrational terms in the expansion of $\left(\sqrt[8]{5} + \sqrt[6]{2}\right)^{100}$ is

(A) 97 (B) 98

(C) 96 (D) 99

44. If $i = \sqrt{-1}$, then $1 + i^2 + i^3 - i^6 + i^8$ is equal to-

(A) 2 – i (B) 1

(C) 3 (D) –1

45. The distance of the point (2, 3) from the line $2x - 3y + 9 = 0$ measured along a line $x - y + 1 = 0$, is

(A) $\sqrt{2}$ (B) $4\sqrt{2}$

(C) $\sqrt{8}$ (D) $3\sqrt{2}$

46. The equation of two equal sides of an isoceles triangle are $7x - y + 3 = 0$ and $x + y - 3 = 0$ and its third side is passes through the point (1, – 10). The equation of the third side is

(A) $x - 3y - 31 = 0$ but not $3x + y + 7 = 0$

(B) neither $3x + y + 7 = 0$ nor $x - 3y - 31 = 0$

(C) $3x = y + 7 = 0$ or $x - 3y - 31 = 0$

(D) $3x + y + 7 = 0$ but not $x - 3y - 31 = 0$

47. The equation of the circle concentric with the circle $x^2 + y^2 - 3x + 4y - c = 0$ and passing through the point (–1, –2) is

(A) $x^2 + y^2 - 3x + 4y - 1 = 0$

(B) $x^2 + y^2 - 3x + 4y = 0$

(C) $x^2 + y^2 - 3x + 4y + 2 = 0$

(D) none of these

48. The straight line $(x - 2) + (y + 3) = 0$ cuts the circle $(x - 2)^2 + (y - 3)^2 = 11$ at

(A) No points (B) One point

(C) Two points (D) None of these

49. The equation of the circle which passes through the

Space for Rough work

intersection of $x^2 + y^2 + 13x - 3y = 0$ and $2x^2 + 2y^2 + 4x - 7y - 25 = 0$ and whose centre lies on $13x + 30y = 0$

(A) $x^2 + y^2 + 30x - 13y - 25 = 0$

(B) $4x^2 + 4y^2 + 30x - 13y - 25 = 0$

(C) $2x^2 + 2y^2 + 30x - 13y - 25 = 0$

(D) $x^2 + y^2 + 30x - 13y + 25 = 0$

50. Ten different letters of an alphabet are given. Words with 5 letters are formed from these given letters. The number of words in which atleast one letter be repeated is

(A) $10^5 - {}^{10}P_5$ (B) $10^5 - {}^{10}P_4$

(C) $5.{}^{10}P_4$ (D) $5.{}^{10}P_5$

ANSWER KEY

1.	(D)	**2.**	(A)	**3.**	(B)	**4.**	(C)	**5.**	(D)	**6.**	(C)
7.	(A)	**8.**	(B)	**9.**	(D)	**10.**	(A)	**11.**	(D)	**12.**	(B)
13.	(D)	**14.**	(C)	**15.**	(A)	**16.**	(B)	**17.**	(D)	**18.**	(B)
19.	(C)	**20.**	(B)	**21.**	(B)	**22.**	(B)	**23.**	(A)	**24.**	(C)
25.	(A)	**26.**	(D)	**27.**	(A)	**28.**	(C)	**29.**	(B)	**30.**	(C)
31.	(D)	**32.**	(B)	**33.**	(A)	**34.**	(C)	**35.**	(B)	**36.**	(B)
37.	(A)	**38.**	(C)	**39.**	(A)	**40.**	(A)	**41.**	(C)	**42.**	(D)
43.	(A)	**44.**	(A)	**45.**	(B)	**46.**	(C)	**47.**	(B)	**48.**	(A)
49.	(B)	**50.**	(A)								

Space for Rough work