

For Class IX Students

SCIENCE MOVEMENT APTITUDE TEST

Date: -08 - 10 - 2017

Time Allotted: 2 Hrs.

(SMAT)

Maximum Marks : **180**

- Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.
- You are not allowed to leave the Examination Hall before the end of the test.

INSTRUCTIONS

A. General Instructions

1. This booklet is your Question paper containing **45 questions**. All questions are compulsory.
Scientific aptitude (15Q), Mathematics (15Q), General Science (15Q)
2. **+4 for correct answer , No negative for Wrong attempted**
3. Blank papers, clipboards, log tables, slide rules, calculators, cellular phones, pagers, and electronic gadgets in any form are not allowed to be carried inside the examination hall.
4. Fill in the boxes provided below on this page and also write your **Name & Enrollment No.** In the space provided.
5. The answer sheet, a machine-readable (OMR), is provided separately.
6. **DO NOT TAMPER WITH/ MUTILATE THE OMR OR THE BOOKLET.**
7. Do not open the question-paper booklet before being instructed to do so by the invigilators.

B. Filling the OMR

8. On the Response sheet, write in Black Ball Point Pen, your name, your Enrollment No. and Name of the Centre. **Do not write these anywhere else.**
9. Rough spaces are provided for rough work inside the question paper. No additional sheets will be provided for rough work.
10. Use Only **Black Ball Point Pen** to Darken the OMR Sheet

Name of the Candidate	
Father's Name	
Enrollment No.	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

SCIENTIFIC APTITUDE

01. The equation $\sqrt{x+1} + \sqrt{y} + \sqrt{z-4} = \frac{x+y+z}{2}$ has a solutions then $x+y+z$ can be

- (a) 6
- (b) 7
- (c) 8
- (d) 5

02. Let a, b and c be real and positive parameters. The equation

$$\sqrt{a+bx} + \sqrt{b+cx} + \sqrt{c+ax} = \sqrt{b-ax} + \sqrt{c-bx} + \sqrt{a-cx} \quad \text{has}$$

- (a) Exactly two solution
- (b) Exactly one solution
- (c) No solution
- (d) None of these

03. The real solutions of equation

$$\sqrt{4-x\sqrt{4-(x-2)\sqrt{1+(x-5)(x-7)}}} = \frac{5x-6-x^2}{2} \quad \text{is}$$

- (a) Odd integer
- (b) Irrational number
- (c) Prime number
- (d) None of these

04. The number of real ordered pair satisfy

$$(16x^{200} + 1)(y^{200} + 1) = 16(xy)^{100}.$$

- (a) 3
- (b) 4
- (c) 5
- (d) 6

05. The number of solution for x in equation $5^{2x} - 26 \cdot 5^x + \sqrt{5^{2x} - 26 \cdot 5^x + 26} = -24$ is.

- (a) 1
- (b) 2
- (c) 3
- (d) None of these

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06. When put some smaller circles of radii 1 into a big circle of radius 11, such that each small circle is tangent to the big circle internally, and any two small circles have no overlapped part. How may small circles can be put in at most?
- (a) 30
(b) 31
(c) 32
(d) 33
07. If the following four words are arranged in alphabetical order, which word will come first in the English dictionary?
- (a) Disseminate
(b) Dissociate
(c) Dissipate
(d) Distract
08. How many such pairs of letters are there in the word RECRUIT, each of which has as many letters between them in the word as in the English alphabet ?
- (a) One
(b) Two
(c) Three
(d) None
09. In a row at a bus stop, Amit is 7th from the left and Praksh is 9th from the right. Both of them interchange their positions and thus Amit becomes 11th from the left. How many people are there in that row ?
- (a) 20
(b) 18
(c) 21
(d) 19
10. What are the functions of goblet cells ?
- (a) Production of HCl
(b) Production of mucus
(c) Production of enzymes
(d) Production of hormones
11. Find out the correct sentence
- (i) Hybridization means crossing between genetically dissimilar plants.
(ii) Cross between two varieties is called as interspecific hybridization.
(iii) Introducing genes of desired character into a plant gives genetically modified crop.
(iv) Cross between plants of two species is called as inter-varietal hybridisation.
- (a) (i) and (iii)
(b) (ii) and (iv)
(c) (ii) and (iii)
(d) (iii) and (iv)

- 12. The remainder when $1 + x + x^2 + x^3 + \dots + x^{2006}$ is divided by $x - 1$ is :**
- (a) 2005
 (b) 2006
 (c) 2007
 (d) 2008
- 13. The remainder on dividing $121^n - 25^n + 1900^n - (-4)^n$ by 2000 is :**
- (a) 1
 (b) 1000
 (c) 100
 (d) 0
- 14. The first term of an A.P. is -1 , and the C.D. is -3 , the 12th term is**
- (a) 34
 (b) -34
 (c) 32
 (d) -32
- 15. $\sqrt{11\sqrt{11\sqrt{11\sqrt{11\dots\dots 4 \text{ terms}}}}} =$**
- (a) $\sqrt[16]{11^5}$
 (b) $\sqrt[16]{11}$
 (c) $\sqrt[16]{11^{15}}$
 (d) None of these

MATHEMATICS

- 16. The remainder when x^{45} is divided by $x^2 - 1$ is -**
- (a) $2x$
 (b) $-x$
 (c) 0
 (d) x
- 17. Find the square root of the expression**

$$\frac{1}{xyz}(x^2 + y^2 + z^2) + 2\left(\frac{1}{x} + \frac{1}{y} + \frac{1}{z}\right)$$

- (a) $\frac{x + y + z}{xyz}$
- (b) $\sqrt{\frac{yz}{x}} + \sqrt{\frac{zx}{y}} + \sqrt{\frac{xy}{z}}$
- (c) $\sqrt{x} + \sqrt{y} + \sqrt{z}$
- (d) $\sqrt{\frac{x}{yz}} + \sqrt{\frac{y}{xz}} + \sqrt{\frac{z}{xy}}$

18. Factorize the expression $9x^4 + \frac{1}{x^4} + 2$.

(a) $\left(3x^2 - \frac{1}{x^2} + 2\right)\left(3x^2 + \frac{1}{x^2} + 2\right)$

(b) $\left(3x^2 - \frac{1}{x^2} - 2\right)\left(3x^2 + \frac{1}{x^2} + 2\right)$

(c) $\left(3x^2 - \frac{1}{x^2} + 2\right)\left(3x^2 - \frac{1}{x^2} + 2\right)$

(d) $\left(3x^2 + \frac{1}{x^2} + 2\right)\left(3x^2 + \frac{1}{x^2} - 2\right)$

19. If the each of algebraic expression $lx^2 + mx + n$, $mx^2 + nx + l$ and $nx^2 + lx + m$ are perfect square, then $\frac{l+m}{n} = \underline{\hspace{2cm}}$.

(a) -4

(b) 6

(c) -8

(d) None of these

20. Resolve into factors : $\left(\sum_{x,y,z} x\right)^3 - \sum_{x,y,z} x^3$

(a) $(x + y)(y + z)(z + x)$

(b) $-(x + y)(y + z)(z + x)$

(c) $3(x+y)(y+z)(z+x)$

(d) $-3(x+y)(y+z)(z+x)$

21. Find the fourth vertex of Rhombus whose consecutive vertices are $(-1,5), (5,7), (-1,1)$.

(a) $(-7,1)$

(b) $(-5,-1)$

(c) $(-7,-1)$

(d) None of these

22. What is the last digit of $2^{15} \times 3^9$?

(a) 6

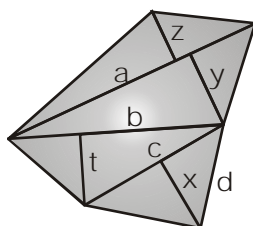
(b) 3

(c) 4

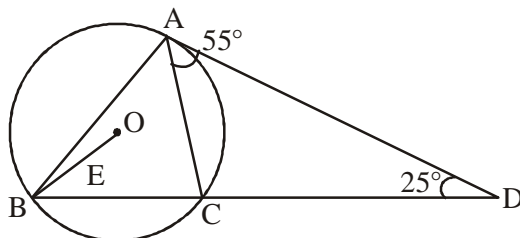
(d) None of these

23. A surveyor in his field book has drawn the plot as shown in the given figure.

The area of the plot is :



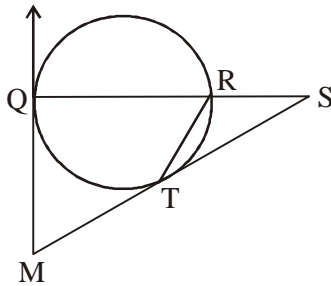
- (a) $\frac{1}{2} (az + by + ct + dx)$
 - (b) $\frac{1}{2} (bt + cx + ay + az)$
 - (c) $\frac{1}{2} (cx + bt + by + az)$
 - (d) $\frac{1}{2} (d + t) (c + x) + \frac{1}{2} (a + b) (y + z)$
24. If an equilateral triangle of area X and a square of area Y have the same perimeter, then :
- (a) $X > Y$
 - (b) $X = Y$
 - (c) $X < Y$
 - (d) $X \leq Y$
25. PQR is a triangle with PQ = 15, QR = 25, RP = 30. A, B are points on PQ and PR respectively such that $\angle PBA = \angle PQR$. The perimeter of the triangle PAB is 28, then the length of AB is.....
- (a) 5
 - (b) 10
 - (c) 20
 - (d) None of these
26. In the below figure, O is the centre of the circle and AD is a tangent to the circle at A. If $\angle CAD = 55^\circ$ and $\angle ADC = 25^\circ$, then $\angle ABO =$



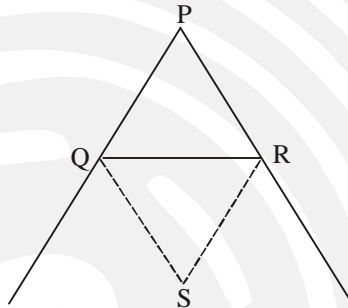
- (a) 10°
- (b) 15°
- (c) 20°
- (d) 25°

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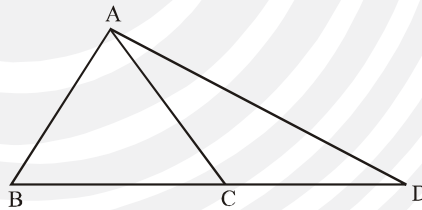
27. In the figure below (not to scale), STM and MQ are tangents to the circle at T and Q respectively. SRQ is a straight line. $SR = TR$ and $\angle TSR = 25^\circ$. Find $\angle QMT$.



- (a) 55°
 (b) 60°
 (c) 75°
 (d) None of these
28. In this figure QS and RS are bisectors of exterior angles Q and R . The $\angle QSR + \angle P/2$ is equal to



- (a) 270°
 (b) 180°
 (c) 90°
 (d) 60°
29. In the adjoining figure, if $\angle B = \angle ACB = 65^\circ$ and $\angle D = 30^\circ$, then -



- (a) $BC > CA > CD$
 (b) $AB = CA < CD$
 (c) $BC < CA, CA > CD$
 (d) $BC > CA, CA < CD$
30. A card is drawn at random from a pack of 52 cards. What is the probability that the card drawn is a Face card or a Ace card ?
- (a) $\frac{4}{13}$
 (b) $\frac{3}{13}$
 (c) $\frac{2}{13}$
 (d) None of these

GENERAL SCIENCE

31. A passenger travels along the straight road for half the distance with velocity v_1 and the remaining half distance with velocity v_2 . Then average velocity is given by

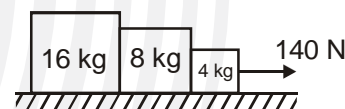
- (a) $v_1 v_2$
- (b) v_2^2 / v_1^2
- (c) $(v_1 + v_2) / 2$
- (d) $2v_1 v_2 / (v_1 + v_2)$

32. At some instant, acceleration of 5 kg is 10 m/s^2 . The acceleration of 10 kg at that instant is



- (a) 1 m/s^2
- (b) 2 m/s^2
- (c) 3 m/s^2
- (d) 4 m/s^2

33. Three masses of 16, 8 and 4 kg are placed in contact with each other as shown in figure. If a force of 140 N is applied on 4 kg mass, then force on 16 kg mass will be ;



- (a) 140 N
- (b) 120 N
- (c) 100 N
- (d) 80 N

34. If a car at rest accelerates uniformly to a speed of 144 km/hr in 20 sec, it covers a distance of

- (a) 20 cm
- (b) 400 cm
- (c) 1440 cm
- (d) 2980 cm

35. Two equal masses are separated by a certain distance and the force between them is 8 N. When the distance of separation is increased by 1m, the force between them reduces to 2 N. Find the initial distance of separation and their masses.

- (a) $1 \text{ m}, 0.346 \times 10^6 \text{ kg}$
- (b) $2 \text{ m}, 0.346 \times 10^5 \text{ kg}$
- (c) $3 \text{ m}, 0.344 \times 10^5 \text{ kg}$
- (d) None of these

36. The particle size of solute in true solution is of the order of -

- (a) 10^{-6} m
- (b) 10^{-7} m
- (c) 10^{-8} m
- (d) 10^{-9} m

37. Which of the following pairs does not contain both elements?

- (a) Carbon, silicon
- (b) Helium, nitrogen
- (c) Bronze, zinc
- (d) Copper, silver

38. A 15% alcohol solution means

- (a) 15 mL alcohol and 85 mL water
- (b) 15 mL alcohol and 100 mL water
- (c) 15 mL water and 85 mL alcohol
- (d) 15 mL alcohol and 50 mL water.

39. Which of the following is the formula of nitrate ion ?

- (a) N_3^-
- (b) NO_3^-
- (c) NO^+
- (d) NO_2^+

40. The number of molecules in 16.0 g of oxygen is -

- (a) 6.02×10^{23}
- (b) 6.02×10^{-23}
- (c) 3.01×10^{-23}
- (d) 3.01×10^{23}

41. Who is known as "Father of white revolution" in India?

- (a) Prof. M.S. Swaminathan
- (b) Dr. V. Kurien
- (c) Mrs. Indira Gandhi
- (d) Shri Jai Prakash Narain

42. The first experiment in artificial insemination was performed by

- (a) Aristotle
- (b) Berzelius
- (c) Spallazani
- (d) Linneaus

43. Select the odd one out :

- (a) The movement of water across a semi-permeable membrane is affected by the amount of substances dissolved in it.
- (b) Membranes are made of organic molecules like proteins and lipids.
- (c) Molecules soluble in organic solvents can easily pass through the membrane.
- (d) Plasma membrane contains chitin sugar in plants.

44. Bulk transport occurs through

- (a) endocytosis
- (b) exocytosis
- (c) endosmosis
- (d) both (a) and (b)

45. Tissue found in area of regular wear and tear is

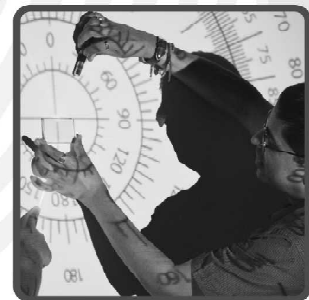
- (a) simple squamous epithelium
- (b) stratified squamous epithelium
- (c) simple cuboidal epithelium
- (d) stratified cuboidal epithelium



I must confess I am jealous of the term atom; for though it is very easy to talk of atoms, it is very difficult to form a clear idea of their nature

Michael Faraday





Your result will be published online on our website www.sciencemovement.com
on or before 31st October 2017.
Those who will qualify will then get a call / email / SMS / mail from us by on or before
20th November 2017 regarding the ultimate event, i.e. Science Movement Camp-2017

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