SCIENCE MOVEMENT

(An initiative of Subhadra Charitable Trust)

For Class VIII students (going to Class IX)

Time Allotted: 2 Hrs.   **(SMAT)**   Maximum Marks : **180**

SCIENCE MOVEMENT APTITUDE TEST

SAMPLE QUESTION PAPER

> ➤ 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.	☐☐☐☐☐☐☐☐☐☐☐☐

Science Movement Cell , Plot No. 308, 3rd Floor, Mahanee Complex, Chandrasekharpur, Bhubaneswar-751016,Odisha

SCIENTIFIC APTITUDE

01. Which of the following shows is the correct way of connecting an ammeter and a voltmeter?

(A)

(B)

(C)

(D)
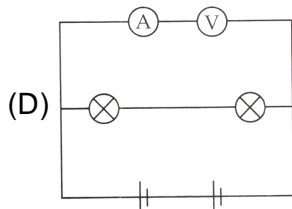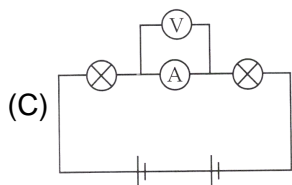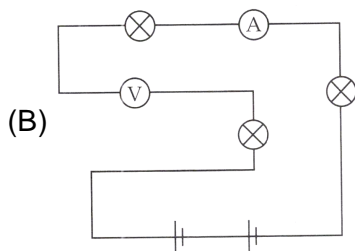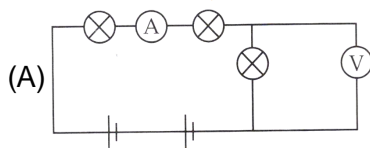
02. The year next to 1996 will have the same calendar as that of the year 1996

(A) 2001

(B) 1996

(C) 1997

(D) 1999

03. If AJAY is written as 1117, then in same code NAMA would be written as

(A) 5114

(B) 5411

(C) 5141

(D) 4511

04   Manisha ranked sixteenth from the top and twenty ninth from the bottom among those who passed an examination. Six students did not participate in the competition and five failed in it. How many students were there in the class ?

(A) 40

(B) 44

(C) 50

(D) 55

05.   Joan swings to and fro. Which graph best describes how her kinetic energy changes with her gravitational potential energy while swinging?

(A)

(B)

(C)

(D)
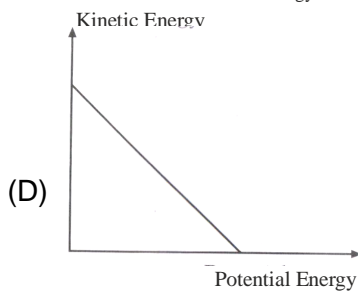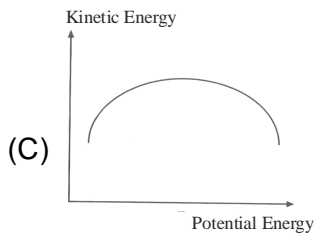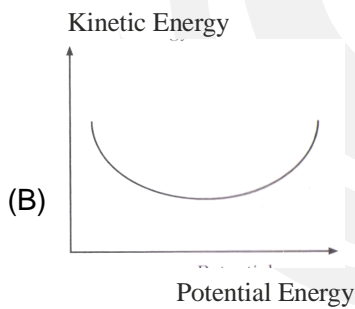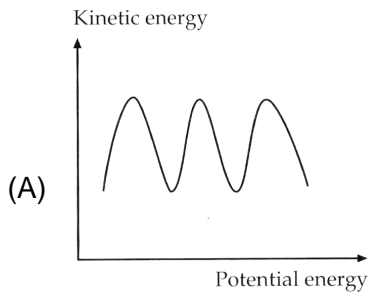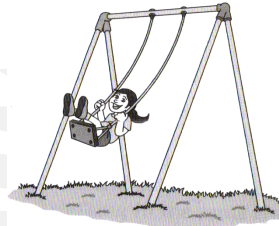
06. A bicycle travels at 50km/h for 2 hours. The remaining 30km is covered at 60 km/h. What is the average speed of the bicycle?

(A) 55 km/h

(B) 50km/h

(C) 52 km/h

(D) 65km/h

07. Which amongst the following is not the property characterized by vulcanized rubber?

(A) It does no melt upon heating

(B) It is resistant to chemical attack

(C) It is an insoluble thermoset polymer

(D) It possesses weak covalent bonds

08. Which of the following tips is incorrect as per PCRA?

(A) Driving should be done at a constant speed

(B) Engine should be kept running at traffic lights.

(C) Correct tyre pressure should be maintained

(D) Regular maintenance of vehicle should be done.

09. What would happen if *Spirogyra* is placed in salt-water?

(A) It will swell due to osmosis.

(B) Protoplasm shrinks due to plasmolysis.

(C) There is no change in the filament.

(D) None of the above.

10. What acts as an anchoring structure in algae?

(A) Hold-fast

(B) Lamina

(C) Stipe

(D) None of these

11. $\left(\dfrac{(x+1)^2\left(x^2-x+1\right)^2}{\left(x^3+1\right)^2}\right)^2 \cdot \left(\dfrac{(x-1)^2\left(x^2+x+1\right)^2}{\left(x^3-1\right)^2}\right)^2$ equals

(A) $(x+1)^4$

(B) $(x^3+1)^4$

(C) 1

(D) $[(x^3+1)(x^3-1)]^2$

12. In the figure , $\overline{CD}$, $\overline{AE}$ and $\overline{BF}$ are one-third of their respective sides. It follows that

$\overline{AN_2} : \overline{N_2N_1} : \overline{N_1D} = 3:3:1$, and similarly for lines BE and CF

Then the area of triangle $N_1N_2N_3$ is:
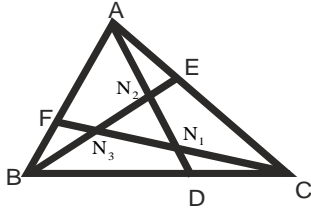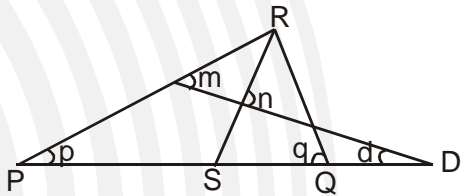
(A) $\frac{1}{10}\Delta ABC$

(B) $\frac{1}{9}\Delta ABC$

(C) $\frac{1}{7}\Delta ABC$

(D) None of these

13. Two oranges,three bananas and four apples cost Rs 25. Three oranges ,two bananas and one apples cost Rs 20. I brought 3 oranges,3 bananas and 3 apples .How much did I pay ?

(A) Rs 22.5

(B) Rs 27

(C) Rs 30

(D) Cannot be determine

14. Haemocoel occurs in

(A) Earthworm

(B) Hydra

(C) Cockroach and Pila

(D) Leech

15. ICVN is

(A) International Code of Veterinary Nomenclature

(B) International Code of Viral Nomenclature

(C) International Code of Vertebrate Nomenclature

(D) International Code of Verma Nomenclature

MATHEMATICS

16. The number of diagonals that can be drawn in a polygon of 100 sides is

(A) 4850

(B) 4950

(C) 9900

(D) 98

17. Reduced to lowest terms , $\dfrac{a^2 - b^2}{ab} - \dfrac{ab - b^2}{ab - a^2}$ is equal to :

(A) $\dfrac{a}{b}$

(B) $\dfrac{a^2 - 2b^2}{ab}$

(C) a^2

(D) a-2b

18. After rationalizing the numerator of $\dfrac{\sqrt{3} - \sqrt{2}}{\sqrt{3}}$ the denominator in simplest from is :

(A) $\sqrt{3}\left(\sqrt{3} + \sqrt{2}\right)$

(B) $\sqrt{3}\left(\sqrt{3} - \sqrt{2}\right)$

(C) $3 - \sqrt{3}\sqrt{2}$

(D) $3 + \sqrt{6}$

19. From a group of boys and girls , 15 girls leave. There are then left two boys for each girl, After this 45 boys leave, There are then 5 girls for each boy, The number of girls in the beginning was:
    (A) 40
    (B) 43
    (C) 29
    (D) 50

20. Of the following statements, the one that is incorrect is :
    (A) Doubling the base of a given rectangle doubles the area.
    (B) Doubling the altitude of a triangle doubles the area.
    (C) Doubling the radius of given circle doubles the area.
    (D) Doubling the divisor of a fraction and dividing its numerator by 2 changes the quotient .

21. If $\dfrac{xy}{x + y} = a, \dfrac{xz}{x + z} = b$ and $\dfrac{yz}{y + z} = c$, where a, b and c are other then zero, then x equals :

(A) $\dfrac{abc}{ab + ac + bc}$

(B) $\dfrac{2abc}{ab + bc + ac}$

(C) $\dfrac{2abc}{ab + ac - bc}$

(D) $\dfrac{2abc}{ac + bc - ab}$

22. In the expression xy^2. the values of x and y are each decreased 25% the value of the expression is:

(A)decreased 50%

(B) decreased 75%

(C) decreased 37/64 of its value

(D) decreased 27/64 of its value

23. The number of revolutions of wheel, with fixed centre and with an outside diameter of 6 cm , required to cause a point on the rim to go one metre is :

(A) 880

(B) $\dfrac{440}{\pi}$

(C) $\dfrac{880}{\pi}$

(D) none of these

24 Given triangle PQR with RS bisecting angle R, PQ extended to D and angle n a right angle, then:

(A) $\angle m = \dfrac{1}{2}(\angle p - \angle q)$

(B) $\angle m = \dfrac{1}{2}(\angle p + \angle q)$

(C) $\angle d = \dfrac{1}{2}(\angle q + \angle p)$

(D) $\angle d = \dfrac{1}{2}\angle m$

25. The value of $\left(\dfrac{1}{16}\right)a^0 + \left(\dfrac{1}{16a}\right)^0 - 64^{-1/2} - (-32)^{-4/5}$ is :

(A) $1\dfrac{13}{16}$

(B) $1\dfrac{3}{16}$

(C) 1

(D) $\dfrac{7}{8}$

26. The difference between compound interest compounded annually and simple interest on a certain sum of money for 2 years at 4% is Rs. 20. The sum is :

(A) Rs. 1250

(B) Rs. 12500

(C) Rs. 25000

(D) Rs. 7500

27. The difference between compound interest compounded annually and simple interest on a certain sum of money for 2 years at 5% p.a is Rs. 12.50. What is the compound interest on this sum for 2 years?

    (A) Rs. 262.50

    (B) Rs. 525.00

    (C) Rs. 250

    (D) Rs. 512.50

28. By how much is 12% of 24.2 more than 10% of 14.2?

    (A) 14.85

    (B) 2.762

    (C) 0.1784

    (D) 1.484

29. If $x^2 + \dfrac{1}{x^2} = 62$, then the value of $x^4 + \dfrac{1}{x^4}$ is:

    (A) $8^4 - 2^8 - 2$

    (B) $8^4 + 2$

    (C) $8^4 - 2^8 + 2$

    (D) $8^4 + 2^8 - 2$

30. If a variable takes the discrete values $\alpha + 4$, $\alpha - \dfrac{7}{2}$, $\alpha - \dfrac{5}{2}$, $\alpha - 3$, $\alpha - 2$, $\alpha + \dfrac{1}{2}$, $\alpha - \dfrac{1}{2}$, $\alpha + 5$ $(\alpha > 0)$, then the median is-

    (A) $\alpha - \dfrac{5}{4}$

    (B) $\alpha - \dfrac{1}{2}$

    (C) $\alpha - 2$

    (D) $\alpha + \dfrac{5}{4}$

GENERAL SCIENCE

31. Which is not a correct statement?

    (A) a force can change the state of rest or uniform motion of a body

    (B) a force can change the direction of a body

    (C) a force can change chemical properties of a body

    (D) a force can change the dimensions of a body.

32. A body P has mass 2m and velocity 5v. Another body Q has mass 8m and velocity 1.25v. The ratio of momentum of P and Q is :

    (A) 2: 1

    (B) 1 : 1

    (C) 1 : 2

    (D) 3 : 2

33. When we vigorously shake a branch of a tree, some leaves get detached. It is due to the:

    (A) inertia of rest

    (B) inertia of motion

    (C) some leaves are loosely held by the branch

    (D) none of the above.

34. Which of the following conversion is not possible

    (A) Mechanical energy $\rightarrow$ heat energy

    (B) Mechanical energy $\rightarrow$ heat energy + sound energy

    (C) heat energy $\rightarrow$ mechanical energy + sound energy

    (D) heat energy $\rightarrow$ mechanical energy

35. The unit of thermal capacity is

    (A) cal°C

    (B) cal/g

    (C) cal/g/°C

    (D) none of these

36. The relation between frequency (n) and wavelength (l) is given by (v is velocity, n is frequency and T is time-period)

    (A) $v = nl$

    (B) $n = \dfrac{\lambda}{v}$

    (C) $v = \dfrac{n}{\lambda^2}$

    (D) $n = \dfrac{T}{\lambda}$

37. Most synthetic fibres have -

    (A) High elasticity

    (B) Low elasticity

    (C) Moisture observing capacity

    (D) None of these

38. Terra Cotta is -

    (A) Kaolin

    (B) Clay

    (C) Unglazed primitive pottey

    (D) Porcelain

39. Hard glass is prepared by :-

    (A) Fusing a mixture of sodium carbonate, calcium carbonate and silica

    (B) Fusing a mixture of potassium carbonate, calcium carbonate and silica

    (C) Fusing a mixture of potassium carbonate and any oxide

    (D) None of the above

40. Arrange the following metal in the increasing order of their reactivity towards water Zinc, Iron, Magnesium, Sodium-

    (A) Iron < Magnesium < Sodium < Zinc

    (B) Iron < Zinc < Magnesium < Sodium

    (C) Magnesium < Iron < Sodium < Zinc

    (D) Sodium < Iron < Magnesium < Zinc

41. The presence of DNA in mitochondria and chloroplast supports the hypothesis that

    (A) Mitochondria and chloroplast both originated as independent free-living organisms

    (B) Glycolysis occurs in both mitochondria and chloroplast

    (C) Chloroplast and mitochondria undergo meiosis and mitosis independent of nucleus

    (D) ATP is produced in chloroplast as well as mitochondria

42. Green pigments capable of capturing the energy of sunlight are located within the

    (A) endoplasmic reticulum

    (B) chloroplasts

    (C) cell wall

    (D) ribosomes

43. Mitochondria are more in cells where

    (A) There is least cellular activity

    (B) There is maximum cellular activity.

    (C) There is an average activity

    (D) They form tissues.

44. What is the correct hierarchy of taxonomic categories?

    (A) Kingdom, class, phylum, family, order, species, genus

    (B) Kingdom, phylum, order, class, family, genus, species

    (C) Kingdom, phylum, genus, class, species, order, family

    (D) Kingdom, phylum, class, order, family, genus, species

45. Beryllium shows diagonal relationship with-

    (A) Mg

    (B) Na

    (C) Al

    (D) B

✾ ✾ ✾

SCIENCE MOVEMENT APTITUDE TEST (SMAT)

For Class VIII students (going to Class IX)

ANSWER KEY

01.	A		24.	B
02.	A		25.	D
03.	C		26.	B
04.	D		27.	D
05.	D		28.	D
06.	C		29.	C
07.	D		30.	A
08.	B		31.	C
09.	B		32.	B
10.	A		33.	A
11.	C		34.	D
12.	C		35.	A
13.	B		36.	A
14.	C		37.	A
15.	B		38.	C
16.	A		39.	B
17.	A		40.	B
18.	D		41.	A
19.	A		42.	B
20.	C		43.	B
21.	D		44.	D
22.	C		45.	C
23.	D			