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Level - 1 : All Level-1 successful* participants will get certificate, aptitude report and online subscription, and school toppers will be eligible for school hero medals.

Level - 2 : School toppers* will be selected for level-2-National level - online computer based interactive test held at exam centres all over India. Besides selection for level-3, winner will get merit certificate, medals, educational CDs, laptop, scholarship and other prizes. There is no level 2 in Art, Cricket, Cyber, NIPO and Biotech.

Level - 3 : Toppers will qualify# for level 3-International level-where you will compete with students globally. Get selected for EHF's International Olympiad training camp. Only Indian organization giving students exposure to global competitions. Represent India & win laurels. Guidance by top scientists. Prizes ranges from cash (millions of \$), gadgets, foreign trips, publicity, fame, scholarships, Internships, conference participation and more.

*# See prospectus/website for details

1. You are allowed additional 10 minutes to fill the required details in the **RESPONSE SHEET (OMR)**.
2. The question paper is made as per syllabus guidelines & pattern given in the information Booklet. The Question Paper for Classes 1 to 6 contains 25 Questions each to be answered in 40 minutes. The Question paper for classes 7 to 12 contains 50 Questions each to be answered in 60 minutes. All questions are compulsory. Further instructions are given in the instruction letter to the teacher.
3. Use the response sheet to mark your responses by darkening the required circle. The response sheet has to be returned to the foundation, duly filled in. **THE STUDENT CAN RETAIN THE QUESTION PAPER.**

**EHF
NATIONAL
IIT-PMT
OLYMPIAD**

N I P O

**8
Class**

**A1
Paper
Code**

L E V E L - 1

SCIENCE

1. A bullet is fired by a light rifle and the other with a heavy rifle by the same force. Which rifle will cause more injury to the shoulder?
(1) Light rifle
(2) Heavy rifle
(3) Both cause same injury
(4) None of these
2. A force of 60 N is acted on a body of mass 1.5 kg at rest, the acceleration of the body is
(1) 4 ms^{-2} (2) 40 ms^{-2}
(3) 5 cms^{-2} (4) None of these
3. 1 nano second = _____ sec.
(1) 10^{-6} (2) 10^{-9}
(3) 10^{-12} (4) None of these

4. A constant force acts on body of mass 0.9 kg at rest for 10 s, if the body moves a distance of 250 m, the magnitude of force is
(1) 4.5 N (2) 9.0 N
(3) 13.5 N (4) None of these
5. When an object undergoes acceleration :
(1) Its speed always increases
(2) Its velocity always increases
(3) It always falls towards the earth
(4) None of these
6. The estimation of inertia of a body is made with the help of a physical quantity, that is
(1) Weight
(2) Mass
(3) Momentum
(4) None of these

7. A door of dimensions length 2 m, breadth 1.2 m is acted upon by a certain force due to the air inside the room. The atmospheric pressure is 105 pa, the magnitude force is
- (1) 2.4×10^5 N (2) 240 N
(3) 2.4 KN (4) None of these
8. "A force acts on an object which is free to move. If we know the magnitude of the force and the mass of the object, Newton's second law of motion enables us to determine the object's:"
- (1) Weight (2) Speed
(3) Acceleration (4) None of these
9. When a net force acts on an object, the object will be accelerated in the direction of the force with an acceleration proportional to
- (1) The force on the object
(2) The velocity of the object
(3) The mass of the object
(4) None of these
10. A solid floats in water with $\frac{3}{4}$ of its volume below the surface of water. The density of the solid will be
- (1) 75 kgm^{-3} (2) 750 kgm^{-3}
(3) $75 \times 10^2 \text{ kgm}^{-3}$ (4) None of these
11. Atomic mass of an element is
- (1) The actual mass of one atom of the element
(2) The relative mass of an atom of the element
(3) The average relative mass of different atoms of the element
(4) None of these
12. On which of the following the buoyant force does not depend
- (1) Weight of the liquid displaced by the object
(2) Loss in weight of the body in liquid
(3) Density of the object immersed
(4) None of these
13. A solid of mass 220 kg and density 1.1 gcm^{-3} is completely immersed in water, then the buoyancy force acting on it is
- (1) 242 N (2) 200 N
(3) 2000 N (4) None of these
14. What are the components present in quick lime?
- (1) Ca & H (2) Ca & O
(3) Ca, H & O (4) None of these
15. Which of the following elements exists in liquid state at 30 degree celsius?
- (1) Sodium (2) Chlorine
(3) Bromine (4) None of these
16. The substance that is not pure is
- (1) Brass (2) Copper wire
(3) Aluminium sheet (4) None of these
17. Which of the following is not correct according to Dalton's atomic theory?
- (1) Matter is made up of atoms
(2) Atoms of all substances are identical in all respects
(3) Atoms combine in a simple whole number ratio
(4) None of these
18. The "plum pudding" model of the atom was devised by:
- (1) Dalton (2) Democritus
(3) Rutherford (4) None of these
19. Cathode rays have
- (1) Mass only without any charge
(2) Negative charge with negligible mass
(3) Neither mass nor charge
(4) None of these
20. The mass of the atom is determined by_____.
- (1) Neutrons (2) Neutron and proton
(3) Electron (4) None of these
21. In the preparation of chalk pieces, which of the following compounds is used?
- (1) Bleaching powder
(2) Slaked lime
(3) Lime stone
(4) None of these
22. An object placed 4 m from a plane mirror is shifted by 0.5 m away from the mirror. What is the distance between the object and its image?
- (1) 4 m (2) 3.5 m
(3) 9 m (4) None of these

23. During lightning, streaks of bright light are seen. This is due to:
- (1) UV rays from the sun
 - (2) IR rays from the sun
 - (3) Discharge of accumulated electric charges
 - (4) None of these
24. A rock undergoes stress. The way a given rock responds to a stress depends on:
- I. Its temperature
 - II. How slowly or quickly the stress is applied
 - III The confining pressure on the rock
- (1) I and II only (2) II and III only
 - (3) I, II and III (4) None of these
25. Which of the following statements is true?
- (1) Dry cells are rechargeable
 - (2) During electrolysis of water, oxygen bubbles are formed at the negative terminal
 - (3) LED can glow even by passing a weak electric current
 - (4) None of these

MATHEMATICS

26. Factorize: $1 - 2xy - (x^2 + y^2)$
- (1) $(1 + x - y)(1 + x + y)$
 - (2) $(1 - x - y)(1 + x + y)$
 - (3) $(1 - x - y)(1 - x + y)$
 - (4) None of these
27. In a class there are x seats. If each student occupies one seat, 9 students remain standing and if two students occupy one seat, 7 seats are left empty. Then, the number of seats in the class is
- (1) 23 (2) 32
 - (3) 18 (4) None of these
28. If $(a^3 + 2^3 + 3^3)^{2/3} = 65$, then a is equal to
- (1) 1 (2) -1
 - (3) 0 (4) None of these
29. Tom is 7 years younger than Ben. In four years of time, Tom will be half of Ben's age. In the next year the sum of their ages is
- (1) 15 (2) 13
 - (3) 17 (4) None of these
30. Which of the following cannot be a perfect square?
- (1) 1681 (2) 1849
 - (3) 1762 (4) None of these
31. $(8, 15, x)$ is a Pythagorean triplet then x is
- (1) 16 (2) 17
 - (3) 18 (4) None of these
32. Two numbers are 50% and 60% less than a third number. How much percentage is the first number to the second number ?
- (1) 110% (2) 125%
 - (3) 112% (4) None of these
33. If a four-digit perfect square number is such that the number formed by the first two digits and the number formed by the last two digits are also perfect squares, then the four digit number is:
- (1) 6416 (2) 3616
 - (3) 1681 (4) None of these
34. The digit in the units place in the square root of 15876 is:
- (1) 8 (2) 6
 - (3) 4 (4) None of these
35. A sum of money doubles itself in 4 years at compound interest. It will amount to 8 times itself at the same rate of interest in:
- (1) 18 years (2) 12 years
 - (3) 16 years (4) None of these
36. The perimeter of a rhombus is 40 m and its height is 5m. Its area is:
- (1) 60 sq.m (2) 50 sq.m
 - (3) 45 sq.m (4) None of these
37. A merchant buys goods at 25% off the list price. He desires to mark the goods so that he can give a discount of 20% on the marked price and still clear a profit of 25% on the selling price. What percent of the list price must he mark the goods?
- (1) 125% (2) 100%
 - (3) 80% (4) None of these
38. If the radius and the height of a right circular cylinder are doubled, then its volume becomes:
- (1) 2 times (2) 3 times
 - (3) 8 times (4) None of these

39. If the division $N \div 5$ leaves a remainder of 3, what might be the ones digit of N ?

- (1) 2 (2) 3
(3) 4 (4) None of these

40. What should be subtracted from $-7/8$ so as to get $5/12$?

- (1) $31/24$ (2) $8/5$
(3) $-31/24$ (4) None of these

41. It is given that 'x' varies directly as 'y' and inversely as the square of 'z' and that $x = 10$ when $y = 4$ and $z = 14$. Then, when $y = 16$ and $z = 7$, x equals:

- (1) 180 (2) 160
(3) 154 (4) None of these

42. The numerical expression $\frac{3}{8} + \frac{(-5)}{7} = \frac{-19}{56}$ shows that

- (1) rational numbers are closed under addition.
(2) rational numbers are not closed under addition.
(3) rational numbers are closed under multiplication.
(4) None of these

43. The digit in the tens place of a two digit number is 3 more than the digit in the units place. Let the digit at units place be b . Then the number is

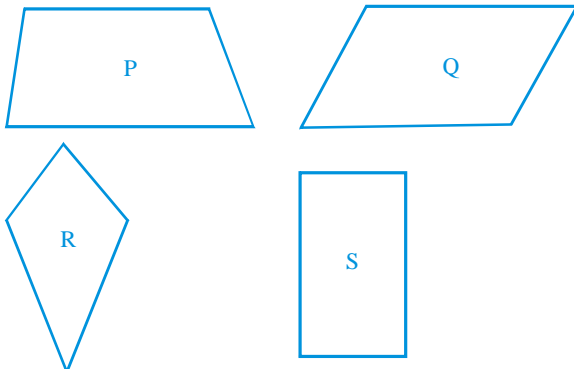
- (1) $11b + 30$ (2) $10b + 30$
(3) $11b + 3$ (4) None of these

44. What should be added to $\frac{-3}{5}$ to get $\frac{-7}{5}$?

- (1) $\frac{4}{5}$ (2) 1
(3) $\frac{-4}{5}$ (4) None of these

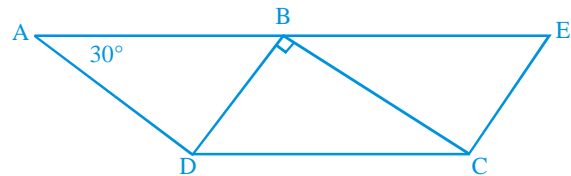
45. Which of the following figures satisfy the following property?

- Has two pairs of congruent adjacent sides.



- (1) P (2) Q
(3) R (4) None of these

46. In the given figure, ABCD and BDCE are parallelograms with common base DC. If $BC \perp BD$, then $\angle BEC =$



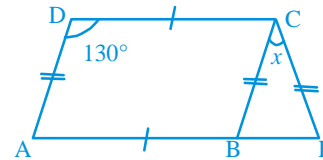
- (1) 60° (2) 30°
(3) 150° (4) None of these

47. The value of x in the following figure is



- (1) 120° (2) 180°
(3) 60° (4) None of these

48. In Fig. what is the value of x if ABCD is a parallelogram and CBE is an isosceles triangle.

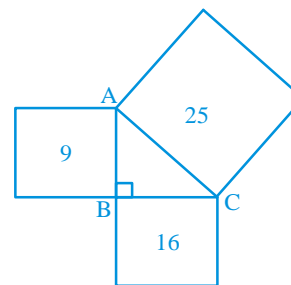


- (1) 130° (2) 50°
(3) 80° (4) None of these

49. How many natural numbers lie between squares of 12 and 13.

- (1) 22 (2) 23
(3) 24 (4) None of these

50. As shown in figure below, the area of three squares are given. Find the perimeter of $\triangle ABC$.



- (1) 12 units (2) 12.5 units
(3) 19.5 units (4) None of these



END OF THE EXAM