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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 G.K. 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. Level 3 is in Maths, Science & Cyber only.

*# See prospectus/website for details

- You are allowed additional 10 minutes to fill the required details in the **RESPONSE SHEET (OMR)**. **STUDENTS OF CLASS 1 & 2 HAVE TO UNDERLINE** THE CORRECT ANSWER IN THE QUESTION PAPER ITSELF. THEY ARE NOT REQUIRED TO USE THE RESPONSE SHEET (OMR). THEY HAVE TO FILL THEIR NAME, ROLL NUMBER, CLASS, SCHOOL NAME IN THE SPACE PROVIDED IN THE QUESTION PAPER.
- 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.
- 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 except for classes 1 and 2.

NATIONAL IIT PMT OLYMPIAD

NIP O

8 Class **A1 Paper Code**

LEVEL - 1

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MATHEMATICS

1. What is the multiplicative inverse of $6\frac{3}{4}$?

- (1) $\frac{4}{25}$ (2) $\frac{4}{27}$
- (3) $\frac{4}{26}$ (4) $\frac{5}{27}$

2. Which number line correctly shows the rational numbers

$-\frac{6}{11}$, $-\frac{7}{11}$ and $-\frac{2}{11}$?

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

3. A polygon, whose measure of all angles are more than 90° is

- (1) Triangle (2) Square
- (3) Pentagone (4) Trapezium

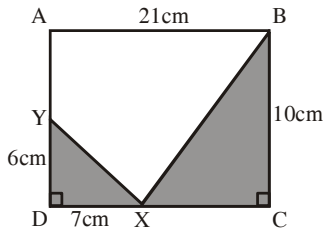
4. $9\frac{3}{4} + 11\frac{1}{2} + 8\frac{1}{4}$ equals

- (1) 28.5 (2) 27.5
- (3) 30.5 (4) 29.5

5. $-\frac{3}{7}$ lies

- (1) Between -1 and 0
- (2) To the right of 0 on the number line
- (3) Doesn't lies on the number line
- (4) All of above

6. The given figure shows a rectangle ABCD. Line segments XY and XB are then drawn inside the rectangle. What is the area of the shaded region in the given figure?



- (1) 77 cm^2 (2) 210 cm^2
 (3) 91 cm^2 (4) 119 cm^2

7. Which statement correctly represents the equation

$$\frac{5}{3}(q + 9) = 12 ?$$

- (1) The product of $\frac{5}{3}$ and 9 more than q equals 12.
 (2) Five-Third of the product of q and 9 equals 12.
 (3) The sum of Five-third of q and 9 equals 12
 (4) Five-third the sum of q and 9 equals 12.

8. What is the value of y for the equation

$$\frac{5}{2}(y + 1) + 4 = 24 ?$$

- (1) 5 (2) 6
 (3) 7 (4) 9

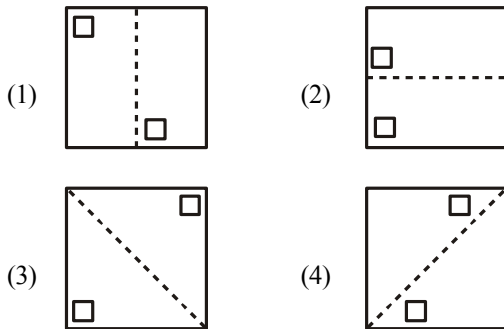
9. Which expression would be added to $(-12x^2 + 14y^2 + 6xy^2 + 48x^2y)$ to obtain $(17x^2y - 2x^2 - 6y^2 + 15xy^2)$?

- (1) $10x^2 - 20y^2 + 9xy^2 - 31x^2y$
 (2) $17x^2 + 10y^2 + 9xy^2 + 30x^2y$
 (3) $10x^2 - 15y^2 + 9xy^2 + 15x^2y$
 (4) $7x^2 + 17y^2 + 27xy^2 - x^2y$

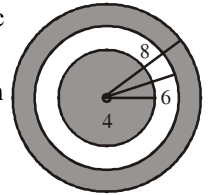
10. Which expression is obtained upon subtracting the sum of $(2x^3 + 7x^2 + 4x)$ and $(2x^3 - 4x^2 - 5x + 7)$ from the sum of $(-x^3 + 7x + 6)$ and $(3x^3 - 5x^2 - 11x - 3)$?

- (1) $2x^3 + 8x^2 + 3x + 4$
 (2) $-2x^3 - 8x^2 - 5x - 4$
 (3) $6x^3 - 2x^2 - 5x + 10$
 (4) $-6x^3 + 2x^2 + 5x - 10$

11. In which of the following figures does the dotted line represent the line of symmetry?



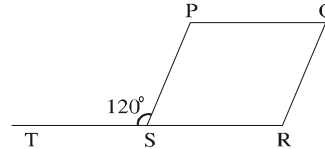
12. The given figure shows three concentric circles.



What is the area of the shaded region in the given figure?

- (1) 44π (2) 54π
 (3) 36π (4) 64π

13. In the given figure, side RS of parallelogram PQRS is produced to point T. What is the measure of $\angle PQR$.

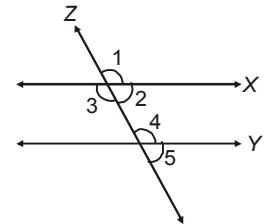


- (1) 50° (2) 120°
 (3) 180° (4) 90°

14. In the given figure, lines X and Y are cut by a transversal Z.

In the given figure, lines X and Y are parallel if

- (1) $\angle 1 = \angle 5$
 (2) $\angle 2 = \angle 5$
 (3) $\angle 2 = \angle 3$
 (4) $\angle 4 = \angle 5$

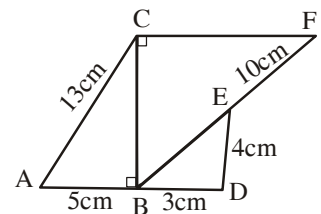


15. Which of the following statement is correct?

- (1) Sum of an obtuse angle and an acute angle can be complementary.
 (2) Sum of two acute angles can be supplementary.
 (3) Sum of an obtuse angle and an acute angle can be supplementary.
 (4) Sum of two obtuse angles can be complementary.

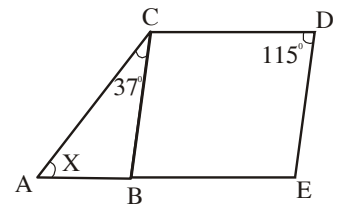
16. What is the perimeter of the given figure?

- (1) 89cm
 (2) 102cm
 (3) 61cm
 (4) 58cm



17. What is the value of 'X' in the given figure?

- (1) 150°
 (2) 28°
 (3) 156°
 (4) 85°

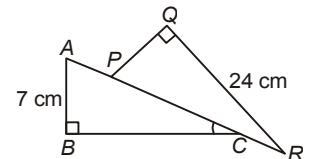


18. In the given figure,

$\triangle ABC$ is congruent to $\triangle PQR$.

If $PC = 20$ cm, then what is the length of AR ?

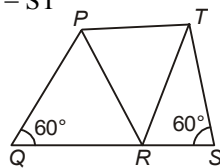
- (1) 20 cm (2) 30 cm
 (3) 40 cm (4) 50 cm



19. In the given figure $PQ = RS$ and $QR = ST$

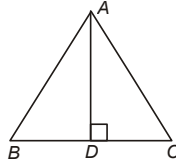
What type of a triangle is $\triangle PRT$?

- (1) Equilateral triangle
- (2) Isosceles
- (3) Both (1) and (2)
- (4) None of these

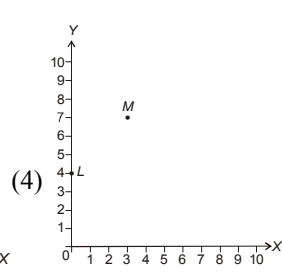
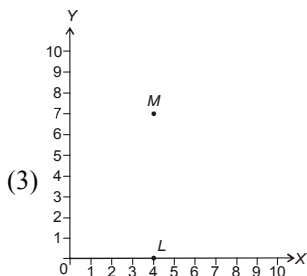
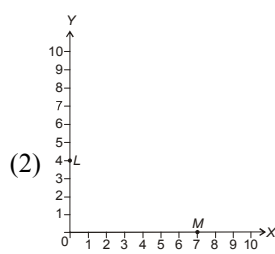
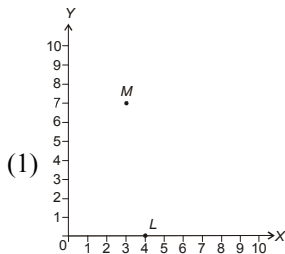


20. Which of the following statement is true about the given diagram?

- (1) $\triangle ABC$ is isosceles, if $AB \neq BC \neq CA$.
- (2) $\triangle ABD \cong \triangle ACD$, if $BD = 1/2 BC$ and $\angle ABD = \angle ACD$.
- (3) $(\angle ABD + \angle BAD + \angle ADB) < (\angle ABC + \angle BAC + \angle ACD)$
- (4) None of these



21. Which graph correctly shows the points $L(4, 0)$ and $M(3, 7)$?



22. Factorize $a^4b - ab^4$

- (1) $ab(a^3 + b^3)$
- (2) $ab(a - b)(a^2 + ab + b^2)$
- (3) $ab(a + b)(a^2 - ab + b^2)$
- (4) $ab(a^2 - b^2)$

23. In area of a triangle formed by the points $(1,0)$, $(1,2)$ and the origin is

- (1) 1 sq. unit
- (2) 2 sq. unit
- (3) 3 sq. unit
- (4) 4 sq. unit

24. If x and y are the smallest digits in the numbers $311x2$ and $42y5$ such that they are divisible by 7, then what is difference between x and y ?

- (1) 1
- (2) 3
- (3) 7
- (4) 8

25. The product of a two digit number with a number is given as

$$\begin{array}{r} 7A \\ \times 6 \\ \hline B6A \end{array}$$

Here, A and B are single digit numbers.

If $A \neq B$, then what is the value of $(A^2 + B^2 - AB)$?

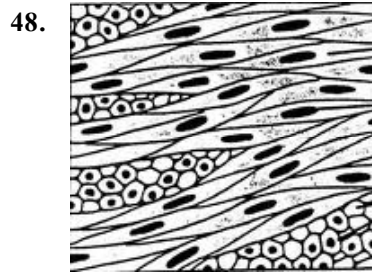
- (1) 40
- (2) 48
- (3) 60
- (4) 55

SCIENCE

26. The nucleus is surrounded by a jelly like substance in a cell which is called
- (1) Cytoplasm
 - (2) Cell membrane
 - (3) Protoplasm
 - (4) None of these
27. Seasonal changes occur because
- (1) Of green house gases.
 - (2) Earth's rotation on its axis.
 - (3) Earth's axis of rotation is tilted at an angle to the normal
 - (4) None of these
28. The salivary glands secrete
- (1) Pepsin
 - (2) Trypsin
 - (3) Ptyalin
 - (4) None of these
29. Which of the following contains maximum amount of humus?
- (1) Desert soil
 - (2) Mountain soil
 - (3) Laterite soil
 - (4) None of these
30. Which cells are involved in respiration ?
- (1) WBC
 - (2) RBC
 - (3) Blood plasma
 - (4) None of these
31. Rhythmic contraction and relaxation of heart is called
- (1) Heart beat
 - (2) Pulse rate
 - (3) Resting pulse
 - (4) None of these
32. Female reproductive part of a flower is called
- (1) Carpel
 - (2) Sepal
 - (3) Petal
 - (4) None of these
33. Which of the following is the worst conductor of heat in the group ?
- (1) Copper
 - (2) Plastic
 - (3) Aluminium
 - (4) None of these
34. In which of the following modes of heat transfer does the molecule travel from the hotter part of the body to the colder part ?
- (1) Conduction
 - (2) Convection
 - (3) Radiation
 - (4) None of these
35. Acids when reacting with carbon and bicarbonate will liberate
- (1) Oxygen
 - (2) Carbon monoxide
 - (3) Carbon dioxide
 - (4) None of these.
36. The bending of the stem of a plant towards a source of light is called
- (1) Phototropism
 - (2) Photorespiration
 - (3) Solar bending
 - (4) None of these
37. Pure water is
- (1) An atom
 - (2) A compound
 - (3) A mixture
 - (4) None of these
38. Micro organism feeds upon dead plants and animal tissue and converts them into dark coloured substance called
- (1) Fertilizers
 - (2) Manures
 - (3) Humus
 - (4) None of these

39. Which of the following matches the word sterilisation ?
- (1) Drinking water is treated with chlorine before domestic use
 - (2) The result of being injected with a dead or weakened form of a micro organism to stimulate antibody production
 - (3) Using yeast and sugar solution to make alcohol
 - (4) None of these
40. Tissue culture is used for the propagation of
- (1) Potato
 - (2) Spirogyra
 - (3) Jasmine
 - (4) None of these
41. Blood does not clot in a person suffering from
- (1) Leukaemia
 - (2) Anaemia
 - (3) Haemophilia
 - (4) None of these
42. The end product of glycolysis is
- (1) Glucose
 - (2) Pyruvic acid
 - (3) Carbon dioxide
 - (4) None of these
43. The prime constituent of urine is
- (1) Water
 - (2) Urea
 - (3) Uric acid
 - (4) None of these
44. Lemon juice contains
- (1) Acetic acid
 - (2) Citric acid
 - (3) Amino acid
 - (4) None of these
45. Which is the mode of storage of food in plants
- (1) Starch
 - (2) Glycogen
 - (3) Glucose
 - (4) None of these
46. To show that zinc is more reactive than copper, the correct procedure is to
- (1) Prepare copper sulphate solution and dip zinc strip in it
 - (2) Prepare zinc sulphate solution and dip copper in it
 - (3) Heat zinc and copper strips
 - (4) None of these

47. The site of detoxification in liver cells is
- (1) Lysosome
 - (2) RER
 - (3) Ribosome
 - (4) SER



This is the picture of which type of cells ?

- (1) Cheek cells
 - (2) Muscle cells
 - (3) Nerve cells
 - (4) None of these.
49. What can a Genetic Engineer do ?
- (i) He can create a clone
 - (ii) He can combine the genes of variety of individual in the same individual
 - (iii) He can grow two coloured flowers on a single plant
- (1) All (i), (ii) and (iii)
 - (2) Only (i) and (ii)
 - (3) Only (ii) and (iii)
 - (4) None of these.
50. Take a rubber sucker and press it hard against a smooth surface such as a window pane. This expels the air from it. We will find it difficult to pull it away. This is because
- (1) Atmospheric pressure pushes it from inside
 - (2) Atmospheric pressure pushes it from outside
 - (3) Atmospheric pressure acts equally in all directions
 - (4) None of these



END OF THE EXAM