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NIMO

10 Class **A1 Paper Code**

L E V E L - 1

Level - 1 : All Level-1 successful* participants will get certificate, apititude 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 EHFs 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.

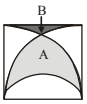
* # See prospectus/website for details

1. 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.
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 except for classes 1 and 2.

MENTAL ABILITY

1. Given set : (246, 257, 358), Choose the similar set?
(1) (145, 235, 325) (2) (143, 253, 246)
(3) (273, 365, 367) (4) None of these

2. The diagram shows a semicircle and two quarter circles inscribed in a square of side length 2. The difference between the area of the shaded region A and the area of the shaded region B is equal to



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

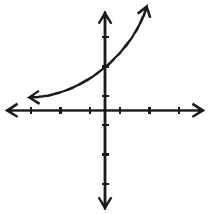
3. If 'tee see pee' means 'Drink fruit juice', 'see kee lee' means 'Juice is sweet' and 'lee ree mee' means 'He is intelligent', which word in that language means 'sweet'?
(1) see (2) kee
(3) lee (4) pee

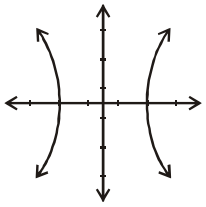
4. X and Y are sisters. Y is wife of Z, P is son of Q, M is daughter of Y. N is husband of X, Q is father of Y. O is daughter of L, K is wife of L. X is mother of L. Who is the sister of L?
(1) M (2) Z
(3) P (4) Q

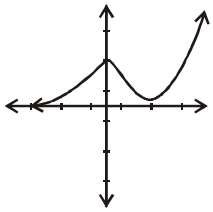
5. The angle of elevation of a cloud from a point h metre above a lake is θ. The angle of depression of its reflection in the lake is 45^o.
The height of the cloud is
(1) $h \tan(45^o + \theta)$ (2) $h \cot(45^o + \theta)$
(3) $h\, l \tan(45^o + \theta)$ (4) None of these

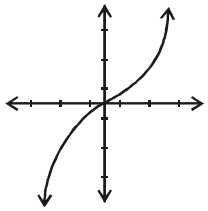
6. The 7th term of the geometric sequence $\frac{3}{64}, \frac{-3}{16}, \frac{3}{4}, -3,$ .....is
(1) -48 (2) 192
(3) 3072 (4) -12288

7. Which graph is not a function ?

(1) 

(2) 

(3) 

(4) 

8. If D is the brother of B, how B is related to C? To answer the question which of the statement is/are necessary?

(a) The son of D is the grandson of C.

(b) B is the sister of D.

(1) Only (a) (2) Only (b)

(3) Either (a) or (b) (4) Both are required

9. What is a_5 in the sequence defined as follows ?

$$a_n = 5.2^{(n-1)}$$

(1) $a_5 = 80$ (2) $a_5 = 10$

(3) $a_5 = 160$ (4) $a_5 = 40$

10. A farmer pumps water from an irrigation well to water his field. The time it takes to water the field varies inversely with the rate at which the pump operates. It takes 20 hours to water the field when the pumping rate is 600 litres per minute. If he adjusts the pump so that it pumps at a rate of 400 litres per minute, how long will it take to water the field?

(1) 30 hours (2) 40 hours

(3) 15 hours (4) 12.5 hours

MATHEMATICS

11. In a class of 60 student, 40 study Hindi and rest study Bengali. If a student is choosen randomly, then the probability that the students study Bengali is

(1) $\frac{1}{2}$ (2) $\frac{1}{60}$

(3) $\frac{1}{3}$ (4) $\frac{2}{3}$

12. The mean of numbers 6, y, 7, x and 14 is 8. Then the value of y in terms of x is

(1) $2y = 13 - x$ (2) $2y = 14 - 5x$

(3) $y = 13 - x$ (4) None of these

13. The diameter of the base of a cone is increased by 25%, while its height is decreased by 10% .

By what percent does the volume of the cone increase?

(1) 36.173% (2) 38.231%

(3) 39.251% (4) 40.625%

14. What is the multiplicative inverse of $6\frac{2}{4}$?

(1) 6 (2) $\frac{13}{2}$

(3) $\frac{2}{13}$ (4) $\frac{13}{24}$

15. The linear equation $y = 7x - 3$ cuts the y – axis at

(1) $(0, -3)$ (2) $(\frac{3}{7}, 0)$

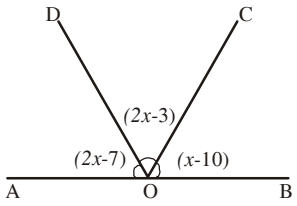
(3) $(1, 0)$ (4) $(0, 7)$

16. The sum of the cost of 15 red and 7 white roses is ₹200. If the cost of each red rose is ₹ x and that of each white rose is ₹y , then which equation represents the given information?

(1) $\frac{15}{y} + \frac{7}{x} = 200$ (2) $\frac{15}{x} - \frac{7}{y} = 200$

(3) $15x + 7y = 200$ (4) $15y - 7x = 200$

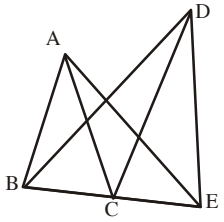
17. If AB is a straight line, then what is the measure of $\angle$ AOD?



(1) 40^o (2) 73^o

(3) 80^o (4) None of these

18. In the given figure, Δ ABC and Δ CED are equilateral triangles. They are of sides 4cm and 7cm respectively.

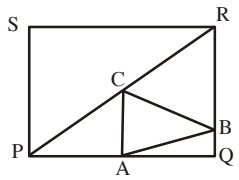


If AE = 12.0cm, then what is the perimeter of Δ ACE?

(1) 23cm (2) 27cm

(3) 20cm (4) 39cm

19. The given figure shows a rectangle PQRS in which A, B and C are the mid-points of sides PQ, QR and PR respectively.



If the area of ΔABC is 37 cm^2, then what is the area of rectangle PQRS?

(1) 296 cm^2 (2) 148 cm^2
(3) 262 cm^2 (4) 198 cm^2

20. Find the value of k such that $(x-2)$ is a factor of $(2x^3 - 6x^2 + 5x + k)$

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

21. $x - 8xy^3 =$

(1) $x(1-2y)(1+2y+4y^2)$

(2) $x(1+2y)(1-2y+4y^2)$

(3) $x(1-2y)(1-7y+y^2)$

(4) $x(1+3y)(1+2y-7y^2)$

22. If the length of each side of a triangle is decreased by 20% then what is the percentage decrease in the area of the triangle?

(1) 30% (2) 32%
(3) 36% (4) 37%

23. Jatin invested a certain sum of money at 8% p.a. simple interest for 'n' years. At the end of 'n' years, Jatin got back 4 times his original investment. What is the value of n?

(1) 50 years (2) 25 years
(3) 12 years (4) 37 years 6 months

24. If the value 29 is replaced with 45 in the data set {39, 42, 40, 35, 11, 29, 26, 31, 23, 21}, then what is the difference between the value of the new median and the original median?

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

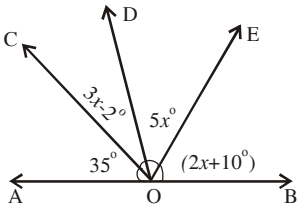
25. Which of the set of points lie on the same straight lines?

(1) $\{(1,2),(0,-2),(2,6)\}$
(2) $\{(0,1),(-1,0),(2,2)\}$
(3) $\{(2,0),(-2,0),(4,3)\}$
(4) None of these

26. If $\angle$P and $\angle$Q are complementary angles and if $\angle$P is x *and* $\angle$Q is y, which equation can be used to find $\angle$Q?

(1) $x - y = 90^o$
(2) $y = 90^o - x$
(3) $x + y = 180^o$
(4) None of these

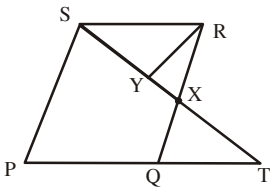
27.



If AOB is a straight line, then what is the value of x?

(1) 10.77 (2) 25
(3) 13.7 (4) 23.3

28. In the given figure, PQRS is a parallelogram. A line passing through a point X on QR is extended to intersect PQ produced at T such that PQ=QT.



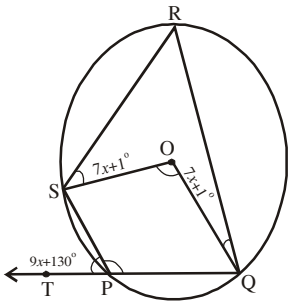
If the area of ΔQXT= 18cm^2, then what is the area of ΔSRY?

(1) 18m^2 (2) 36cm^2
(3) 9cm^2 (4) 72cm^2

29. If the circumference of a circle is reduced by 50%, then area of the circle is reduced by

(1) 75% (2) 40%
(3) 50% (4) 60%

30. What is the value of $\angle SOQ + \angle SPQ$)?



(1) 220° (2) 238°
(3) 230° (4) 240°

31. What is the decimal expansion of the fraction 50/9 ?

(1) $5.\overline{14}$ (2) $5.\overline{5}$
(3) $5.\overline{93}$ (4) None of these

32. If $\left(3\sqrt{3}+2\sqrt{11}\right)-\left(3\sqrt{11}-\sqrt{3}\right)=4\sqrt{3}+A\sqrt{11}$, then what is the value of A ?

(1) 1 (2) -1
(3) 2 (4) 3

33. Factors of the given expression

$a^2 + b^2 + 2(ab + bc + ca)$ is

(1) $(a+b)(a+b+2c)$ (2) $(b+c)(c+a+2b)$

(3) $(c+a)(a+b+2c)$ (4) $(b+a)(b+c+2a)$

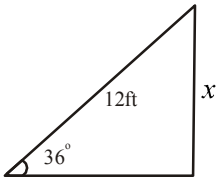
34. In laboratories, the temperatures of certain substances are usually measured in Kelvin.
The linear relationship between Kelvin and Celsius is given by the equation

$$K = C + 273$$

If the temperature of a certain chemical substance is 238°K, then what is its temperature in Celsius?

(1) –35°C (2) –36°C
(3) –37°C (4) 36°C

35.



The 12 foot bed of a dump truck loaded with heavy stone must rise to an angle of 36° before the stone will spill out. Approximately how high must the front of the bed rise (x) to unload ?

$\left[Sine\,36^\circ \approx 0.588 \quad Cos\,36^\circ \approx 0.810 \quad Tan 36^\circ \approx 0.727 \right]$

(1) 7 ft (2) 9 ft
(3) 10 ft (4) 6 ft

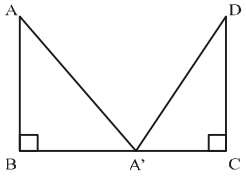
36. A vendor bought 5 toffees for one rupee each. At which price must he sell the toffees to gain 20%?

(1) 3 (2) 4
(3) 5 (4) 6

37. Find compound interest on ₹7500 at 4% per annum for 2 years, compounded annually.

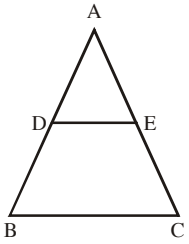
(1) ₹512 (2) ₹552
(3) ₹612 (4) ₹622

38. In the given figure, two isosceles right angle triangle lie on line segment BC. What is the measure of $\angle AA'D$?



(1) 90° (2) 70°
(3) 100° (4) 80°

39. The given figure shows as isosceles triangle ABC in which $AB = AC$. D and E are mid points of sides AB and AC respectively.



If $\angle EDB = 110°$, then what is the measure of $\angle ACB$?

(1) 150° (2) 80°
(3) 70° (4) 40°

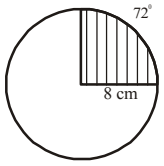
40. The length of each side of an equilateral triangle having an area of $4\sqrt{3}$ cm^2, is

(1) $\frac{4}{\sqrt{3}}$ cm (2) $\frac{\sqrt{3}}{4}$ cm

(3) 3 cm (4) 4 cm

ETG INTERACTIVE SECTION

41. A circle has a radius of 8 centimeters. The measure of the arc of the shaded section is 72°. Which is closest to the area of the shaded section of the circle?



(1) 50.3 cm^2
(2) 40.2 cm^2
(3) 10.1 cm^2
(4) 160.8 cm^2

42. The breadth of a rectangular room is 2m less than its length. If the perimeter of the room is 14m, find the length and breadth of the room

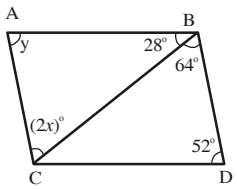
(1) $\frac{9}{2}$ m, $\frac{5}{2}$ m (2) 3m, 4m

(3) $\frac{11}{2}$ m, 3m (4) 7m, $\frac{6}{5}$ m

43. If $x + y = 7$, $y + z = 8$, $z + x = 9$ then the average of $(x + y + z)$ is ....

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

44. In the figure ABCD is a parallelogram. Calculate the value of x and y.



(1) 25°, 68° (2) 77°, 94°
(3) 109°, 40° (4) 12°, 128°

45. If a coin is tossed twice, the probability of getting at least one head is

(1) $\frac{1}{4}$ (2) $\frac{1}{3}$

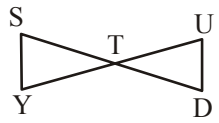
(3) $\frac{3}{4}$ (4) $\frac{3}{2}$

46. Numbers 1, 2, 3, 4 and 5 are written on identical cards such that no number is repeated. These cards are then put inside a box. Inside the second box, identical cards bearing numbers 1, 4, 9, 16 and 25 are placed.
A card is then drawn at random from each box.

What is the probability that the product of the numbers written on the drawn cards is less than or equal to 50?

(1) 0.43 (2) 0.5
(3) 0.76 (4) 0.81

47. In the accompanying diagram, point T is the midpoint of $\overline{SD}$ and $\overline{YU}$, $\overline{SY}$ and $\overline{UD}$ are drawn.



Which statement can be used to prove $\Delta STY \cong \Delta DTU$?

(1) SSS $\cong$ SSS
(2) ASA $\cong$ ASA
(3) SAS $\cong$ SAS
(4) None of these

48. If 1 is added to both the numerator & denominator of a given fraction, it beomes (4/5). If however, 5 is subtracted from both the numerator & denominator, the fraction becomes (1/2). Find the fraction.

(1) 7/9 (2) 2/7
(3) 3/8 (4) None of these

49. If the sum of the roots of $ax^2 + bx + c = 0$ is equal to the sum of the squares of their reciprocals, then $bc^2 + ab^2 =$

(1) $2ac$ (2) $2a^2c$
(3) $2ac^2$ (4) $2a^2c^2$

50. If $x = \sqrt{12 + \sqrt{12 + \sqrt{12 + ...}}}$ infinity. Find x.

(1) $2\sqrt{3}$ (2) infinity
(3) 4 (4) None of these

END OF THE EXAM