

ALL INDIA SAINIK SCHOOLS ENTRANCE EXAMINATION : 2011**PAPER I – MATHEMATICS & SCIENCE****Class-IX**

Time : 2:30 h

Max Mk : 275

Name in full Roll No.....

Initials of Invigilator Code No.....

(To be filled by the Office)

ENTRANCE EXAMINATION : 2011
MATHEMATICS AND SCIENCE : CLASS IX

Note : Candidate is NOT to write his Name or Roll Number on the Main Answer Book.

Marks Obtained

A		B	
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Code No.

Full Signature of Examiner Checked by

- Note :** (i) This paper contains two parts – Part 'A' –Mathematics and Part 'B' -General Science. You are to attempt **ALL** questions in each part.
- (ii) Part 'A' bearing 200 marks, contains 48 questions. Q.No.1 to 14 carry 2 marks each, Q.No. 15 to 28 carry 3 marks each and Q.No. 29 to 38 carry 6 marks each, Q.No. 39 to 48 carry 7 marks each.
- (iii) Part 'B' bearing 75 marks, contains 32 questions. Q.No.1 to 15 carry 1 mark, Q.No. 16 to 20 carry 2 marks, Q.No. 21 to 25 carry 3 marks each, Q.No. 26 to 32 carry 5 marks each.
- (iv) Write your answer in the question paper itself in the space provided.
- (v) Rough work is to be done at space provided.
- (vi) Write all your Answers in blue / black ink only. Do not use pencil.

ROUGH WORK

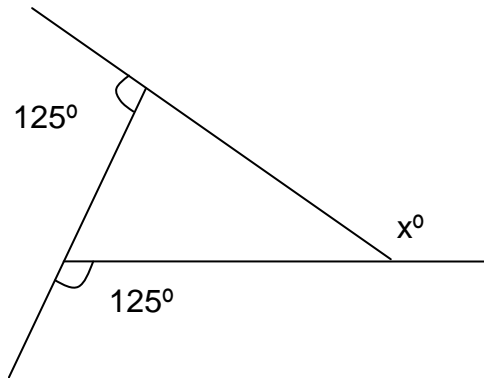
Sample Paper

PART 'A' – MATHEMATICS
(Q.No.1 to 14 carry 2 marks each)

- Q.1 Tell what property allows you to compute $\frac{1}{3} \times \left(6 \times \frac{4}{3}\right)$ as $\left(\frac{1}{3} \times 6\right) \times \frac{4}{3}$.
- Q.2 The room temperature be lowered from 40°C at the rate 5°C every hour. What will be temperature after 10 hrs.
- Q.3 Find the value of x from the equation $ax + b = 0$.
- Q.4 If x and y are variables and k is a constant then $\frac{x}{y} = k$ represents?
- Q.5 1 litre of milk = cm^3 .
- Q.6 Write Euler's formula for any polyhedron.
- Q.7 Express the number 7.5×10^{-4} in the usual form.
- Q.8 Find the smallest number by which 9408 must be divided so that the quotient is a perfect square.
- Q.9 The square root of a number of n–digits will have number of digits if n' is odd.
- Q.10 20% of 25% = %.

Q.11 Find the mean of the following values
32, 41, 28, 54, 35, 26, 23, 38, 33

Q.12 Find value of x° in the figure



Q.13 Find the measure of each exterior angle of a regular polygon of nine sides.

Q.14 Is it possible to have a regular polygon with measure of each exterior angle as 22° .

----- **Q.No. 15 to 28 carry 3 marks each** -----

Q.15 Find 5 rational numbers between $\frac{3}{5}$ and $\frac{3}{4}$.

Q.16 Factorise : $(ax + by)^2 + (ay - bx)^2$.

Q.17 Find : $\frac{2}{5} \times \frac{-3}{7} - \frac{1}{14} - \frac{3}{7} \times \frac{3}{5}$

Q.18 If $x + \frac{1}{x} = 3$ find the value of $x^3 + \frac{1}{x^3}$.

Q.19 If $a + b + c = 13$ and $a^2 + b^2 + c^2 = 69$ evaluate $ab + bc + ca$.

Q.20 If the area of a rhombus is 120 cm^2 and one of its diagonals be 10 cm . Find its perimeter.

Q.21 Evaluate : $\frac{8^{\frac{1}{3}} \times 16^{\frac{1}{3}}}{32^{-\frac{1}{3}}}$

Q.22 By selling 144 hens a person lost the S.P. of 6 hens. Find the loss percentage.

Q.23 Evaluate : $\left(\frac{729}{216}\right)^{\frac{1}{3}} \times \frac{6}{9}$

Q.24 Divide : $x^{3m} - y^{3n}$ by $x^m - y^n$.

Q.25 If 15 workers can build a wall in 48 hours, how many workers will be required to do the same work in 30 hours ?

Q.26 If the perimeter of a trapezium be 52 cm, its non-parallel sides are equal to 10 cm each and its altitude is 8 cm, find the area of the trapezium ?

Q.27 The area of the parallelogram as the base 42 m is same as that of the triangle with base 63 m and height of the triangle is 36 m. Find the height of the parallelogram?

Q.28 Find the least number which must be added to 893304 to obtain a perfect square?

-----**Q.No. 29 to 38 carry 6 marks each**-----

Q.29 A shopkeeper purchased 100 blankets at Rs. 2000 each. He found that 10 blankets were defective and he sold these at Rs. 1200 each. At what rate should he sell the remaining blanket so as to gain 14% on the whole?

Q.30 If each edge of a cube is doubled,

- (i) How many times will its surface area increase?
- (ii) How many times will its volume increase?

Q.31 Find the value of $a^3 + b^3 + c^3 - 3abc$ when $a = 340$, $b = -12$ and $c = -328$.

Q.32 Write a Pythagoras triplet whose smallest member is 17.

Q.33 Evaluate : $(x^{l-m})^{l+m} \times (x^{m-n})^{m+n} \times (x^{n-l})^{n+l}$

Q.34 Find the values of the letters A and B giving reasons for the steps

$$\begin{array}{r}
 12A \\
 + 6AB \\
 \hline
 AO9
 \end{array}$$

Q.35 If $9^{x+2} = 240 + 9^x$. Find the value of x.

Q.36 Factorise : $p^2 + \frac{q^2}{4} + 1 + pq + q + 2P.$

Q.37 The slant height and base diameter of a conical tomb are 25m and 14m. Find the cost of white washing its curved surface area at the rate of Rs. 210 per 100 m² ?

Q.38 Solve : $m - \frac{m-1}{2} = 1 - \frac{m-2}{3}$

-----**Q.No. 39 to 48 carry 7 marks each**-----

Q.39 A cycle merchant allows 25% discount on the marked price of the cycles and still makes a profit of 20%. If he gains Rs. 360 over the sale of one cycle, find the marked price of the cycle ?

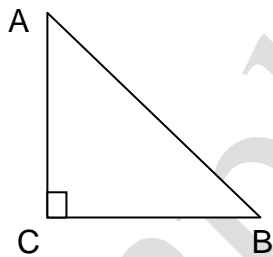
Q.40 A piece of thin wire in the form of an equilateral triangle of side 31.4 cm is bent into a ring with no loss in wire. Find the diameter of the ring ?

Q.41 A steamer, going down stream in a river, covers the distance between two towns in 20 hours. Coming back up stream, it covers this distance in 25 hours. The speed of the water is 4 km/h. Find the distance between two towns.

Q.42 Find the cube root by prime factorisation : 551368.

- Q.43 Each side of a triangle is increased by 10 cm. If the ratio of the perimeters of the new triangle and the given triangle is 5:4, find the perimeter of the given triangle.

- Q.44 In the figure, $\triangle ABC$ is a right angled triangle, right angled at C.



Show that area of equilateral triangle on side AB is equal to the sum of the areas of equilateral triangles on AC and BC.

Q.45 A person invested a sum of Rs. 12000 at 5% per annum compound interest. He receives an amount of Rs. 13230 after n years. Find the value of n ?

Q.46 A farmer has enough food to feed 20 animals in his cattle for 6 days. How long would the food last if there were 10 more animals in his cattle?

Q.47 A cylinder is within the cube touching all vertical faces. A cone is inside the cylinder. If their heights are same with the same base, find the ratio of their volumes.

Q.48 Prove that the diagonals of a rectangle are equal.

Sample Paper

PART 'B' – SCIENCE**Select the correct answer :-****(15x1=15marks)**

1. Yeast helps in the production of
(a) Sugar (b) Alcohol
(c) Oxygen (d) Carbon di oxide
2. Glowing of Electric lamp is not combustion because
(a) Heat produced is not enough (b) Light produced is too much
(c) It is a physical change (d) It is not a chemical reaction
3. Carbon exists in amorphous form as :
(a) Diamond (b) Graphite
(c) Charcoal (d) Carbon mono oxide
4. Out of the different types of fuels the one which is excellent is :-
(a) Solid fuel (b) Liquid fuel
(c) The Gaseous Fuel (d) None of these
5. Pasteurization of milk destroys its :-
(a) Fat content (b) Vitamins
(c) Pathogenic bacteria (d) Sugar content
6. The allotrope of carbon which is a good conductor of heat and is used as lubricant is :
(a) Lampblack (b) Finely powered charcoal
(c) Graphite (d) None of these
7. Petrol or Gasoline is obtained by distillation of Petroleum at temperatures between:
(a) $150^{\circ} - 300^{\circ} \text{C}$ (b) above 300°C
(c) $70^{\circ} - 90^{\circ} \text{C}$ (d) above 400°C
8. In a flame the un-burnt carbon particles are present in the :
(a) Dark inner Zone (b) Luminous Zone
(c) Non-luminous Zone (d) Blue Zone
9. The host of malaria causing protozoan is :
(a) Anopheles mosquito (b) The cow
(c) The earthworm (d) Air
10. Desert Plants are more likely to have :
(a) Large flat leaves (b) Short root system
(c) Reduced leaves (d) A large number of stomata
11. The process of heating ore in the absence of air below its melting point, is called :
(a) Smelting (b) Roasting
(c) Calcination (d) Decomposition

12. Hypermetropia is corrected by using :
- | | |
|-------------------|-----------------------|
| (a) Concave lens | (b) Convex lens |
| (c) Bi-focal lens | (d) Plano-convex lens |
13. Magnified virtual Image is produced by :
- | | |
|--------------------|-------------------------|
| (a) Concave Mirror | (b) Convex Mirror |
| (c) Plane Mirror | (d) Plano-convex Mirror |
14. Which of the following is NOT a planet of the sun?
- | | |
|------------|-------------|
| (a) Sirius | (b) Mercury |
| (c) Saturn | (d) Earth |
15. Phases of the moon occur because:
- | |
|--|
| (a) we can see only that part of the moon which reflects light towards us. |
| (b) Our distance from the moon keeps changing |
| (c) The shadow of the Earth covers only a part of the moon's surface. |
| (d) The thickness of the moon's atmosphere is not constant. |
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16. What is irrigation? What are the main sources of irrigation? (2)
17. What is the angle of incidence of a ray if the reflected ray is at an angle of 90° to the incident ray. (2)
18. "Avoid plastics as far as possible". Explain. (2)

19. A pendulum oscillates 40 times in 4 seconds. Find out its time period and frequency. (2)

20. Does pure water conduct electricity? If not, what can we do to make it conducting? (2)

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21. What is organic manure? Explain the advantage of using manure over the use of fertilizers. (1+2=3)

22. What are vaccines? Name two diseases caused by virus. (2+1=3)
23. Explain the mechanism of Nitrogen fixation by bacteria and blue green algae. (3)
24. What do you mean by global warming? Concentration of which gas may result in global warming? (2+1=3)

25. What is balanced diet? What are the main components of balanced diet? (1+2=3)

26. Define the term Biosphere reserve. What are National Park and Sanctuary? What is Red Data Book? (2+2+1=5)

27. What are the major groups of microorganism? Name the microorganisms which can fix atmospheric nitrogen in the soil. Write two important uses of microorganisms in our lives. (2+1+2=5)

28. Explain the circumstances leading to acid rain. How does acid rain affect the human life? (3+2=5)
29. What is Air pollution? Name the major pollutant gases of air. (2+3=5)
30. What is deforestation? What are the main effects of deforestation? Name the Green house gases. (1+2+2=5)

31. What is fertilization? What does the fertilized egg called? Differentiate between internal and external fertilization? (1+2+2=5)

32. Name the largest planet of the solar system. Name the two other members of the solar system. In which part of the sky can you find Venus if it is visible as an evening star?

(1+2+2=5)