

ALL INDIA SAINIK SCHOOL ENTRANCE EXAMINATION: 2016
PAPER I – MATHEMATICS AND SCIENCE
CLASS –IX

Time: $2\frac{1}{2}$ hrs

Max Marks: 275

Notes:-

(Maths: 200 & Science: 75)

- (a) This paper contains two parts – Part 'A' is Mathematics and Part 'B' is Science. You are required to attempt **ALL** questions in each part.
 - (b) Part 'A' (Mathematics) contains 50 questions. Marks are indicated against each question.
 - (c) Part 'B' (Science) contains 37 questions. Marks are indicated against each question.
 - (d) Write your answers in the space provided in the question paper.
 - (e) Rough work is to be done at space provided only.
 - (f) Write all your answers in **Blue/Black** ink only. **Do not use pencil.**
- This booklet contains 28 pages.

PART- A: MATHEMATICS

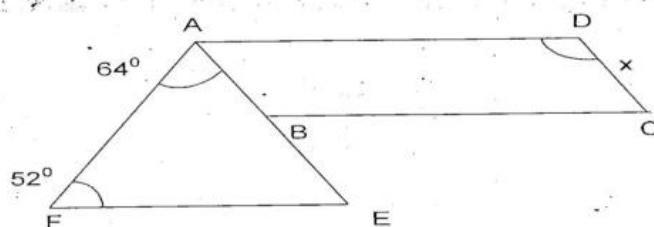
(Max Marks: 200)

SECTION –I

(Each question carries two marks)

- Q1.** Find the product of $(a^2) \times (2a^{22}) \times (4a^{26})$.
- Q2.** Using Euler's formula find the number of faces of polyhedron having 6 vertices & 12 edges.
- Q3.** Calculate the value of $100 \times 8 + 10 \times 1 + 7$
- Q4.** What is the point of intersection of x-axis and y-axis called?
- Q5.** Find the value of x if $\frac{x-8}{5} = \frac{x-12}{9}$
- Q6.** Eleven bags of wheat flour, each marked 5 kg, actually contained the following weights of flour (in kg) 4.97, 5.05, 5.08, 5.00, 5.06, 5.08, 4.98, 5.04, 5.07, 5.00. what is the probability that any of these bags chosen at contains more than 5 kg of flour?
- Q7.** If $x = \left[\left(\frac{56}{28} \right)^0 \div \left(\frac{2}{5} \right)^3 \right] \times \left(\frac{16}{25} \right)$ then find the value of x.
- Q8.** Find cube root of 175616 by factorization method.
- Q9.** How many sides does a regular polygon have, if the measure of an exterior angle is 12° ?
- Q10.** Evaluate $\left[\left(\frac{1}{3} \right)^{-1} - \left(\frac{1}{4} \right)^{-1} \right]^{-1}$

Q11.



AD || BC || EF and AE || DC.

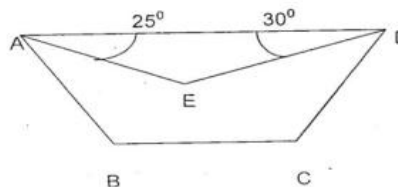
$\angle AFE = 52^\circ$

$\angle EAF = 64^\circ$

$\angle x = \dots\dots\dots$

Q12. If a spinning wheel has 3 green sectors, 1 Blue and 2 Red sectors. What is the probability of getting a green sector?

Q13. In trapezium
AE and DE bisect $\angle CDA$, $\angle DAB$ and
Find $\angle ABC$ and $\angle DCB$

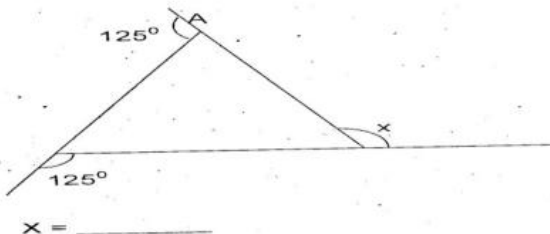


Q14. Two equal sides of an isosceles are each 3 m less than 3 times of third side. Find length of sides, if perimeter is 34 m.

Q15. The area of a circle is given as $\pi x^2 + 10\pi x + 25\pi$. Find the radius as an algebraic expression.

Q16. Three numbers are in ratio 1 : 2 : 3 and sum of their cubes is 4500. Find numbers.

Q17. Find



Q18. A coin is tossed 2 times. What are the total number of possible outcomes?

Q19. What is the range of data 30, 61, 55, 25, 2, 12, 17, 81?

Q20. Find the value of x^{-2} if $x = (100)^{1.4} \div (100)^0$

SECTION –II **(Each question carries three marks)**

Q21. A DVD player and TV were bought for Rs 8,000 each. The shopkeeper made a loss of 4% on the DVD player and a profit of 8% on the TV. Find the gain or loss percent on the whole transaction.

Q21. Arif took a loan of Rs 80,000 from a bank. If the rate of interest is 10% per annum, find the difference in amounts he would be paying after $1\frac{1}{2}$ years, if the interest is (a) compounded annually (b) compounded half yearly.

Q23. Find the value of-(i) $\left[\left(\frac{1}{2}\right)^{-2} + \left(\frac{1}{3}\right)^{-2}\right] + \left(\frac{1}{4}\right)^{-2}$ (ii) $(3^0 + 4^{-1}) \times 2^2$

Q24. What least number must be subtracted from 7250 to get a perfect square? Also, find the square root of this perfect square.

Q25. If $(y^2 + \frac{1}{y^2}) = 83$. Find $y^3 - \frac{1}{y^3}$

Q26. A motor boat covers a certain distance downstream in a river in 5 hours. It covers the same distance upstream in 6 hours. The speed of water is 2km/hr. find the speed of the boat in still water.

Q27. A dealer buys an article for Rs 380. At what price must he mark it so that after allowing a discount of 5%, he still makes a profit of 25%?

Q28. The population of village is 20000. If the birth rate is 5% p.a. and death rate is 3% p.a. find the population after 2 years.

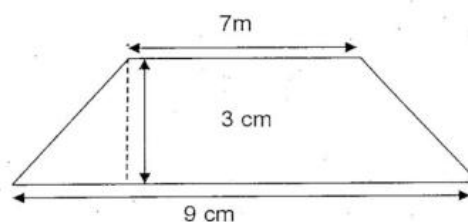
Q29. The distance between two stations is 550 km. two trains start at the same time from the two stations on parallel tracks to cross one another. The speed of one train is 10 km/hr more than the other. If after 3 hours, the trains are 40 km apart, find their respective speed.

Q30. Simplify: $\frac{(5)^3 \times (10)^{-5} \times 3^{-5}}{5^{-7} \times 6^{-5}}$

Q31. Show that $(\frac{4}{3} - \frac{3}{4}y)^2 + 2xy = \frac{16}{9}x^2 + \frac{9}{16}y^2$

Q32. The ratio between interior and exterior angle of a regular polygon is 1 : 8. Find the number of sides of the polygon.

Q33. Find the area of trapezium.



Q34. Find the height of cuboid whose base area is 360 cm^2 and volume is 1800 cm^3 .

Q35. Represent $-\frac{3}{7}$, $-\frac{1}{7}$ and $\frac{2}{7}$ on a number line.

Q36. Find the length of longest pole that can be kept in a room of 12m X 4m X 3m.

Q37. The diameter of base of a cylinder is 140 cm and volume is 1.54 m^3 . Find its height.

Q38. Express 21^2 as sum of two consecutive integers.

Q39. If $21y5$ is a multiple of 9, where y is a digit, what is the value of y?

Q40. Divide: $7(x^3y^2z^2 + x^2y^3z^2 + x^2y^2z^3)$ by $4(x^2y^2z^2)$

Section III

(Each question carries ten marks)

Q41. The hour hand of a circular clock is 10cm long. How much distance will it cover in 2 days or 48 hours?

Q42. A collage is made up of 400 rhombus shaped pieces. The diagonals of the rhombus are 6 cm and 4 cm long. lengths of the parallel sides of the trapezium are 4 cm and 8 cm and the height is 10 cm. Find the area of the collage and also the cost of painting it at the rate of Rs 250 per m^2 .

Q43. The rainwater falling on a roof 40 m x 25 m is collected in a cylindrical tank with diameter 7 m and height 10 m. If the tank is completely filled, find the height of the rainwater on the roof.

Q44. MNOPQ is a regular pentagon. The bisector of angle M meets side OP at K. Find measure of $\angle MKO$.

Q45. How many wooden blocks of size 22 cm x 10 cm x 7 cm are required to make a wooden partition of 11 m x 3.5 m x 40 cm, if the glue and filling material used occupies one tenth of the wooden partition.

Q46. The sides of a swimming pool are 7 m, 6m, and 15 m. If 8400 litres of water is pumped out, what is the decrease in water level?

Q47. Ajit bought 150 kg sugar at Rs 50/-per kg. He sold 70% of sugar at Rs.70 per kg and balance at Rs. 40/-per kg. Find overall profit / loss on the whole deal?

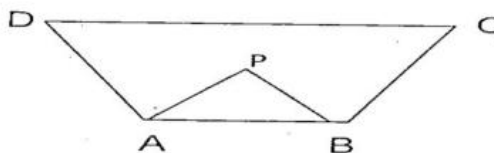
Q48. The following table gives the marks scored by 100 students in an Entrance Examination.

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
No. of Students	4	10	16	22	20	18	8	2

Represent this data in the form of a histogram.

Q49. Find the number of coins, 1.5 cm in diameter and 0.2 cm thick, to be melted to form a right circular cylinder of height 10 cm and diameter 4.5 cm.

Q50. In the adjoining figure, the bisectors of $\angle A$ & $\angle B$ meet at a point P. If $\angle C = 96^\circ$ and $\angle D = 30^\circ$ find $\angle APB$.



PART -B : SCIENCE

(Part B bearing 75 marks, contains 37 questions)

Question No 1 to 15 Carry 1 marks each.

Q1. The synthetic fibre that appears to resemble wool is:

- (a) PET (b) acrylon (c) rayon (d) nylon

Q2. A prominent constellation looking like a distorted form of the letter W or M, is the: (a) Cassiopeia (b) Big dipper (c) Orion (d) Ursa minor

Q3. An example of a plastic which cannot be remoulded again by simple heating is: (a) Polythene (b) PVC (c) polystyrene (d) Bakelite

Q4. Cellulose is made up of a large number of _____ units.

- (a) Amide (b) amino (c) glucose (d) sucrose

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- Q5. Relationship between a biotic community and an abiotic environment is called: (a) Biodiversity (b) Ecosystem (c) Symbiosis (d) Survival
- Q6. Lactobacillus bacteria help to make :
(a) Bread (b) pastries (c) cake (d) curd
- Q7. World Water day is observed on :
(a) 24 March (b) 23 March (c) 21 March (d) 22 March
- Q8. The place meant for conservation of biodiversity in their natural habitat are
(i) Zoological gardens (ii) Botanical gardens (iii) Wildlife sanctuary
(iv) National Park
(a) (i) and (ii) (b) (ii) and (iii) (c) (iii) and (iv) (d) (i) and (iv)
- Q9. Which of the following is considered a clean fuel.
(a) Cowdung cake (b) Petrol (c) Kerosene (d) Hydrogen
- Q10. Which one of the following metals does not react with dilute HCl ?
(a) Magnesium (b) Aluminium (c) Iron (d) Copper
- Q11. Solution of which of the following oxides in water will change the colour of Blue litmus to Red?
(a) Sulphur dioxide (b) Magnesium oxide (c) Iron oxide (d) Copper oxide
- Q12. The material used for making kitchen container is _____
(a) PVC (b) Acrylic (c) Teflon (d) PET
- Q13. Which of the following will not conduct electricity?
(a) Lemon juice (b) Vinegar (c) Tap water (d) Vegetable oil
- Q14. Which of following is not part of solar system?
(a) Asteroid (b) Satellite (c) Constellation (d) Comet
- Q15. The phenomenon of 'Marble Cancer' is due to
(a) Soot particles (b) CFCs (c) Log (d) Acid rain

Question No 16 to 25 carry 2 marks each.

- Q16. Why a crackling sound is heard while taking off a sweater during winters?
- Q17. Differentiate between "Spontaneous and Explosive combustion"
- Q18. Calorific value of wood is 1800 kJ/kg. How much wood is required to produce heat energy of 144,000kJ?
- Q19. A force of 150N is applied to an object of area 5m². Calculate the pressure.
- Q20. How reproduction of Hydra differs from that of Amoeba?
- Q21. Explain why sliding friction is less than static friction?
- Q22. How do vaccines work?

Q23. Hens and frogs are both oviparous exhibiting different types of fertilization. Explain.

Q24. What is meant by Water table?

Q25. Distinguish between 'Speedometer' and 'Odometer'.

Question No 26 to 35 carry 3 marks each.

Q26. What is freezing mixture? How common salt helps to clean pavements covered with snow?

Q27. Mention the effect of iodine in water on the growth of tadpoles.

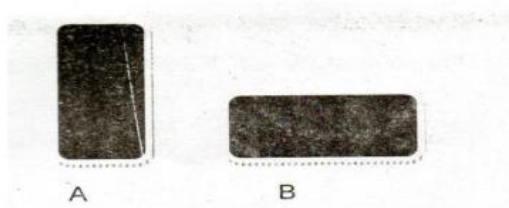
Q28. Write short note on Adam's apple

Q29. Eyes of nocturnal birds have large cornea and large pupil. How does it help them?

Q30. Explain how will you make a tester for testing electric current using a magnetic compass and empty matchbox, a battery of two cells and connecting wire?

Q31. Make sketch of human nerve cell. What functions nerve cell performs?

Q32. A block is kept in two different ways on a table as shown in figure. Explain in which positions the pressure exerted by the block on the table will be maximum.



Q33. Do all the stars in sky move? Explain.

Q34. Explain the process which enables us to perceive motion in a cartoon film.

Q35. Why CFCs are considered pollutants?

Question No 36 & 37 carry 5 marks each.

Q36. Explain '**SOIL PROFILE**' using a neat and labeled diagram.

Q37. Distinguish between metals and non-metals. What are metalloids? Give any two examples of metalloids.

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