ALL INDIA SAINIK SCHOOL ENTRANCE EXAMINATION : 2013

PAPER 1 – MATHEMATICS AND SCIENCE

Class – IX

Time : $2^1/_2$ hrs **Max. Marks : 275**

PART 'A' MATHEMATICS

Max.Marks: 200

Instructions : Q1 to Q 20 bear 2 marks each. (2x20=40)

Q.1 Represent 4/8 and -7/4 on the number line.

Q.2 Simplify : $\frac{3}{17} \div \frac{8}{17} \times \frac{2}{3} + \left(-\frac{2}{7}\right) \times \frac{35}{33} \div \left(-\frac{7}{11}\right)$

Q.3 The sum of two numbers is 15 and the sum of their squares is 113. Find the numbers.

Q.4 Multiply : $(a+7)$ by (a^2+3a+5).

Q.5 If $X + \frac{1}{x} = 3$, find the value of $\left(X^2 + \frac{1}{x^2}\right)$

Q.6 Factories : $25a^2 - 4b^2 + 28bc - 49c^2$.

Q.7 Solve : $\frac{2p - \frac{3}{4}}{p + \frac{4}{7}} = \frac{1}{4}$

Q.8 Find the square root of 128881 by the division method.

Q.9 Arun bought a pair of Skates at a sale where the discount given was 20%. If the amount he pays is Rs 1600, find the marked price.

Q.10 Find the Compound interest on Rs 12600 for 2yrs at 10% per annum Compounded annually.

Q.11 Two adjacent angles of a Parallelogram have equal measures. Find the measure of each of the angles of the Parallelogram.

Q.12 An Unbiased Die is thrown. What is the probability of getting an even number greater than 5?

Q.13 Find the ratio of the circumferences of two concentric circles of radii 2 m and 3 m.

Q.14 The median of the given data is :
133, 73, 89, 108, 94, 140, 94, 85, 100, 120.
(a) 97 (b) 79 (c) 94 (d) None.

Q.15 Two numbers are in the ratio 5:3. If they differ by 18, then the numbers are:
(a) 36 &54 (b) 36&18 (c) 45&27 (d) 63&45

Q.16 The point (0,6) lies on:
(a) X-axis (b) Y-axis (c) Origin (d) None

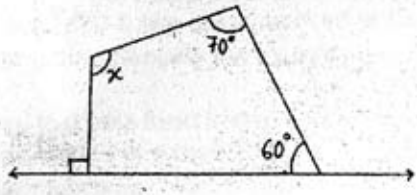
Q.17 The smallest natural number by which 392 must be multiplied so as to get a Perfect Cube is :

(a) 2 (b) 7 (c) 4 (d) 5.

Q.18 The diagonals of a rhombus are 64 cm and 48cm. The height of the rhombus is : -

(a) 30.5cm (b) 36.5cm (c) 38.4cm (d) 58.6cm.

Q.19 In the figure given below, find the value of x.



Q.20 The sum of three consecutive odd numbers is 105. Find the numbers.

Instructions : Q21 to Q40 bear 3 marks each. **(3x20=60)**

Q.21 A number consisting of two digits becomes $\frac{5}{6}$ of itself. If its digits are interchanged. If the difference of the digits is 1. Find the number.

Q.22 Solve : $\frac{3x^2-8}{5x^2+2}=\frac{4}{7}$

Q.23 Find : $\frac{2}{3}\times\frac{3}{5}+\frac{5}{2}-\frac{3}{5}\times\frac{1}{6}$

Q.24 Find the value of : $8\left(x^3-\frac{1}{x^3}\right)$ if $2x-\frac{2}{x}=3$.

Q.25 If (x+y+z) = 9 & (xy+yz+zx) = 23, then find the value of $(x^3+y^3+z^3-3xyz)$

Q.26 Find the area of a rhombus whose side is 6cm and whose altitude is 4cm.

Q.27 Evaluate: $\frac{8^{-1}\times5^3}{2^{-4}}$

Q.28 An article was sold at Rs 18000 at a discount of 10%. Find the marked price of the article and the amount of discount allowed.

Q.29 Find k, $(3/7)^{-5} \times (7/3)^{11}=(3/7)^{8k}$

Q.30 Divide : $(x^{3/2} - xy^{1/2} + x^{1/2}y - y^{3/2})$ by $(x^{1/2} - y^{1/2})$

Q.31 There are 100 students in a hostel. Food provision for them is for 20 days. How long will these Provision last, if 25 more students join the group?

Q.32 The area of a trapezium is 384cm². If its parallel sides are in the ratio 3:5 and the perpendicular distance between them is 12cm, find the smaller of parallel sides.

Q.33 If two adjacent angles of a parallelogram are in the ratio 5:4, find all the angles of the parallelogram.

Q.34 Find the least number that must be added to 1300 so as to get a Perfect Square.

Q.35 Simplify : (a+b)(c-d)+(a-b) (c+d) +2(ac+bd).

Q.36 Find the height of a Cylinder whose radius is 7cm and the total Surface area is 968cm². (Use TT = 22/7).

Q.37 Construct a frequency distribution table for the data on weights (in kg) of 20 students of a class using the intervals 30-35, 30-35 and so on.
40, 38, 33, 48, 60, 53, 31, 46, 34, 36, 49, 41, 55, 49, 65, 42, 44, 47, 38, 39.

Q.38 Rs 1400 is divided among A,B,C so that A receives half as much as B and B receives half as much as C. How much will each of them get?

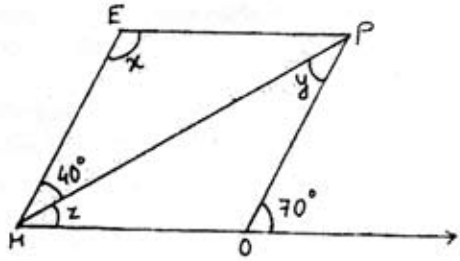
Q.39 Examine if 117912 is a perfect cube or not. If not, find the smallest positive integer by which it must be multiplied so that the product is a perfect cube.

Q.40 A well with 14m inside diameter is dug 8m deep. The Earth taken out of it has been evenly spread all around it to a width of 21 m to form an embankment. Find the height of the embankment.

Instructions : Q 41 to Q 50 bear 10 marks each. (10x10=100)

Q.41 Arjun is twice as old as Shriya. Five years ago his age was three times Shriya's age. Find their present ages.

Q.42 The adjacent figure HOPE is a parallelogram. Find the angles measures x,y & z.



Q.43 A sum of money at compound interest amounts to thrice in 3 years. In how many years will it be 9 times itself at the same rate of interest?

Q.44 (a) Factorise: $x^2 + 6x - 16$.
(b) If a+b=14 and ab = 20, find the value of a^2+b^2.

Q.45 A road roller takes 750 complete revolutions to move once over to level a road. Find the area of the road if the diameter of a road roller is 84 cm & length is 1m.

Q.46 The shape of a garden is rectangular in the middle and semi-circular ends. Total length of the garden including the semi-circular ends is 20 m and its breadth is 7m.Find the perimeter and area of the garden.

Q.47 the denominator of a rational number is greater than its numerator by 8. If the numerator is increased by 17 & the denominator is decreased by 1, the number obtained is 3/2. Find the rational number.

Q.48 During a Sale, a shop offered a discount of 10% on the marked prices of all the items. What would a customer have to pay for a pair of jeans marked at Rs 1450 & two shirts marked at Rs 850 each?

Q.49 Factorise and then Simplify the expression, $12xy\ (9x^2-16y^2) \div 4xy\ (3x+4y)$.

Q.50 A cow is tied to a pole fixed at one corner of a square field of grass of side 40m by means of a rope 20m long. Taking TT - 3.14

(i) Find the maximum area of the part of the field in which the cow can graze.

(ii) Find the area of the remaining part of the field.

(iii) Find the length of the rope, if the cow grazes $1256m^2$ of the field.

PART - B : SCIENCE

Max Marks : 75

Note : - Part B bearing 75 marks, contains 37 questions. Question No. 1 to 15 carry 1 mark each, Question No. 16 To 25 carry 2 marks each, Question No. 26 To 35 carry 3 marks each, Question No. 36 & 37 carry 5 marks each.

Select the correct answer : - (1x15=15)

Mark your answer by putting a Tick Mark (√) on the correct option. Overwriting is NOT permitted.

Q.1 Malaria is caused by :

(a) Virus (b) Protozoa (c) Bacteria (d) Fungi

Q.2 The next nearest star to earth other than the Sun is :

(a) Aurora Australis (b) Aurora Barialis

(c) Alpha Centauri (d) Proxima Centauri.

Q.3 The only non metal which is liquid in state at room temperature is :

(a) Bromine (b) Boron (c) Iodine (d) Indium

Q.4 A cubical wooden block has the dimension 30cm X 20cm X 10 cm. Placed on a flat surface. In which of the following cases the pressure applied is maximum?

When it is placed on surface area

(a) 30cm X 20cm (b) 20cm X 10cm

(c) 30cm X 10cm (d) none of the above

Q.5 What is the time taken by the moon to complete one revolution around the Sun?

(a) 29 days (b) 15 days (c) 365 days (approx.)

(d) 183 days (approx.)

Q.6 Which one of the following is not a communicable disease?
(a) Cholera (b) Tuberculosis (c) Common Cold (d) Polio

Q.7 Which is correct order of Agricultural practices?
(i) Tilling (ii) Irrigation (iii) Sowing
(iv) Adding manure and fertilizer (v) Harvesting

(a)	(i)	(iv)	(iii)	(ii)	(v)
(b)	(i)	(iii)	(iv)	(ii)	(v)
(c)	(ii)	(i)	(iv)	(v)	(iii)
(d)	(i)	(iii)	(ii)	(v)	(iv)

Q.8 When disease carrying microbe enters our body, the body produces
(a) Antigen (b) Antidote (c) Antibody (d) Antioxidant

Q.9 The gland known as 'Master gland' in our body is :
(a) Sweat gland (b) pituitary gland (c) Salivary gland (d) Sebaceous gland.

Q.10 If a ray of light incident on a plane mirror along the Normal then the measure of the angle of incidence (in degree)
(a) 90 (b) 45 (c) 0
(d) Depends on which direction the ray is reflected.

Q.11 The instrument used to detect the charge in a body is
(a) Electrometer (b) Electroscope (c) Voltmeter (d) Barometer

Q.12 For a male child the pair of chromosomes should be
(a) XX (b) XY (c) YX (d) YY

Q.13 The waves produced by earth quake on the surface of earth is known as
(a) Seismic wave (b) Shock wave (c) Mechanical wave
(d) Matter wave.

Q.14 The axis of the Earth inclined to its orbital plane at an angle of
(a) 23.5 degree (b) 53.6 degree (c) 66.5 degree (d) 90 degree

Q.15 If you stand between two parallel mirrors the number of image / images that you observe is / are
(a) One (b) Two (c) Eight (d) Infinite

Write answers within the space provided under the questions: - (2x10 = 20)

Q.16 Write two suitable examples where friction is increased for out benefit.

Q.17 When a copper vessel is exposed to moist air for long it acquires a dull green coating. Why?

Q.18 Why fossil fuels are exhaustible natural resources?

Q.19 What are Endemic and Endangered Species? Give one example of each?

Q.20 A Force of 60 N is applied towards east direction.
What is the magnitude and direction of the force so that:
(a) The net force is zero.
(b) The net force is 110N towards East?

Q.21 What are chromosomes? What are their function?

Q.22 What is Global warming? Why it is a major concern for us?

Q.23 Why are the oily food stuffs such as chips and kurkures are kept in sealed packet and flushed with nitrogen?

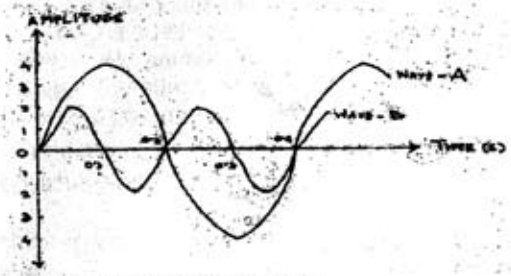
Q.24 Why ornaments are generally made with Gold and Silver?

Q.25 Paper by itself catches fire easily whereas a piece of paper wrapped around an aluminum pipe does not - Give reason.

Write answers within the space provided under the questions : - (3x10=30)

Q.26 What is Acid rain ? What are its consequences?

Q.27



(a) Which sound wave is of more pitch?

(b) Which one is more loud sound?

(c) What is the Frequency of the sound wave B?

Q.28 How do amoeba reproduce? Explain in brief with suitable diagram.

Q.29 Write the differences between a plant cell and animal cell.

Q.30 Current is passed through Copper sulphate (blue colour) solution kept in a beaker by two copper rods connected with a battery.

(a) What changes do you notice in the solution and why?

(b) On which electrode a brown deposition is seen?

(c) Mark the two electrodes as anode and cathode.

Q.31 What are Geostationary Satellites? What are their uses?

Q.32 As a member of your society what would you do to reduce air pollution?

Q.33 What are Hormones? Why adrenalin is known as Stress hormone? From where Insulin and thyroxin hormones are produced?

Q.34 Why lightning occurs between two clouds?

Q.35 How do we hear any sound?

Write answers within the space provided under the questions: - (5x2=10)

Q.36 Two beakers marked 'A' and 'B' contains aqueous solution of copper sulphate ($CuSO^4$) and Ferrous sulphate ($FeSo^4$) respectively. An Iron rod is placed in beaker A and a copper rod in beaker B. What changes do you observe after some time in the two beakers? If there is any change explain it with proper chemical equation.

Q.37 (a) Draw a diagram of human eye and label (3+2=5)

(i) Retina (ii) Optic nerve (iii) Cornea

(iv) Cilliary muscles (v) Eye lens (vi) Iris

(b) How our eye adjusts automatically with the varying intensity of light?