

SAMPLE PAPER – 2009
CLASS – IX
SUBJECT – MATHEMATICS

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper consists of 30 questions divided into four sections – A, B, C and D. Section A contains 10 questions of 1 mark each, Section B contains 5 Questions of 2 marks each, Section C contains 10 questions of 3 marks each and section D contains 5 questions of 6 marks each.
- (iii) There is no overall choice. However, an internal choice has been Provided in one question of two marks each, three questions of three marks each and two questions of six marks each.
- (iv) Use of calculator is not permitted.

SECTION A (10 x 1 = 10 marks)

- Q.1 Two unbiased coins are tossed once. What is the probability of getting exactly one head?
- Q.2 Express 1.324 in the form p/q .
- Q.3 Find the remainder when $x^3 - ax^2 + 6x - a$ is divided by $x - a$.
- Q.4 The angles of a quadrilateral are in the ratio 2 : 4 : 5 : 7. Find all the angles.
- Q.5 In which quadrant do these points (-2,4), (3,-1), (-3, 8), (4, -5) lie?
- Q.6 Factorize: $5x^2 + 16x + 3$
- Q.7 Find the volume of a right circular cylinder which has a height of 21cm and base radius 5cm.
- Q.8 If $x + y + z = 0$, show that $x^3 + y^3 + z^3 = 3xyz$.
- Q.9 Find the arithmetic mean of first 10 natural numbers.
- Q.10 Three angles of a quadrilateral measure 56° , 115° and 84° . Find the measure of the fourth angle.

SECTION – B (5 x 2 = 10 marks)

- Q.11 Rationalise:

$$\frac{\sqrt{5} + \sqrt{3}}{\sqrt{5} - \sqrt{3}}$$

- Q.12 A metallic sphere of radius 10.5 cm is melted and then recast into smaller cones, each of radius 3.5cm and height 3cm. How many cones are obtained?

Q.13 curved surface area of a right circular cylindrical is 4.4 m^2 . If the radius of the base of the cylinder is 0.7m , Find its height.

Q.14 Prove that if a side of a triangle is produced, then the exterior so formed is equal to the sum of the two interior opposite angles.

OR

A sphere of diameter 15.6cm , is melted and cast into a right cone of height 31.2 cm . Find the diameter of the base of the cone.

Q.15 A bag contains 4 red, 5 black and 6 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is;

- a. either red or white
- b. neither black nor red
- c. Red and white
- d. Red or white or black

SECTION – C (10 x 3= 30 marks)

Q.16 Simplify: (a) $(x + y + z)^2 + (x + y - z)^2$ (b) $(2x + 3p)^3 + (2x - 3p)^3$

OR

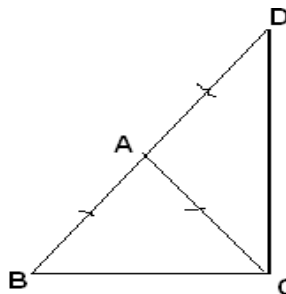
Factorise by using factor theorem.

- (i) $x^3 - 2x^2 - x + 2$
- (ii) $x^3 - 3x^2 - 9x - 5$

Q.17 A solid composed of a cylinder with hemi spherical ends. The whole height of the solid is 19cm and the radius of the Cylinder is 3.5cm . Find the weight of the solid if 1cm^3 of the metal weighs 4.5g .

Q.18 Three unbiased coins are tossed. What is the probability of getting a) two heads b) at least two heads c) at most two heads d) one head or 2 heads.

Q.19 $\triangle ABC$ is an isosceles triangle in which $AB = AC$. Side BA is produced to D such that $AD = AB$. Show that $\angle BCD$ is a right angle.



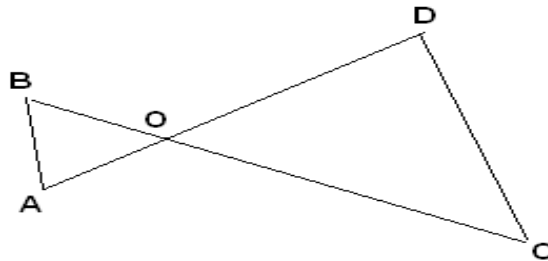
Q.20 Find the median.

C.I.	10-20	20-30	30-40	40-50	50-60
MARKS	5	6	4	2	3

Q.21 Prove that angles opposite to equal sides of an isosceles triangle are equal.

OR

In the given figure, $\angle B < \angle A$ and $\angle C < \angle D$. Show that $AD < BC$.



Q.22 Show that the each angle of a equilateral triangle is 60° .

Q.23 Draw the graph of the equation $2x + y = 6$. Find the coordinates of the point where the graph cuts the x- axis.

Q.24 A park, in the shape of a quadrilateral ABCD, has $\angle C = 90^\circ$, $AB = 9$ m, $BC = 12$ m, $CD = 5$ m and $AD = 8$ m. How much area does it occupy?

OR

A triangle and a parallelogram have the same base and the same area.If the sides of the triangle are 26cm,28cm,30cm the parallelogram stands on the base 28cm find the height of the parallelogram.

Q.25 ABC is a right angle triangle in which $\angle A = 90^\circ$ and $AB = AC$. Find $\angle B$ and $\angle C$.

SECTION – D (5 x 6 = 30 marks)

Q.26 From a solid right circular cylindrical with height 10 cm and radius of the base 6 cm, a right circular cone of the same height and base is removed. Find the volume of the remaining solid.

Q.27 A right triangle ABC with sides 5cm,12cm,13cm is revolved about the side 12cm.Find the volume of the solid so obtained. If the triangle is revolved about side 5cm find volume of the solid so obtained. Also find the ratio of both the volumes.

OR

Show that the line segments joining the mid – points of two sides of a triangle is parallel to the third side and half of it.

Q.28 Prove that sum of three angles of a triangle is 180° .

Using this:

find the value of 'x' if three angles of the triangle are $(2x-7)^\circ$, $(x+25)^\circ$, $(3x+12)^\circ$.

OR

A hemispherical bowl of internal radius 9cm contains a liquid. The liquid is to be filled in to cylindrical shaped small bottles of diameter 3 cm and height 4 cm. how many bottles are required to empty the bowl?

Q.29 A metal pipe is 77 cm long. The inner diameter of a cross section is 4 cm, the outer diameter 4.4 cm. Find its

- (i) inner curved surface area,
- (ii) outer curved surface area,

(iii) total surface area.

Q.30 Find the missing frequencies in the following distribution. It is given that mean of the Frequency distribution is 50.

Also find mode.

Class	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	Total
f	17	F_1	32	F_2	19	120