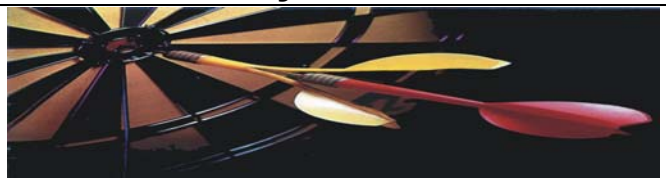

Year of Quality education 18th

Code No. **Series AG-FA** **TMG-D/79/89**

- Please check that this question paper contains 3 printed pages.
- Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- Please check that this question paper contains 30 questions.

General Instructions: -

1. All questions are compulsory.
2. The question paper consists of 30 questions divided into three sections A, B ,C and D . Section A contains 10 questions of 1 marks each, Section B is of 5 questions of 2 marks each, Section C is of 10 questions of 3 marks each and Section D is of 5questions of 6 marks each.
3. Write the serial number of the question before attempting it.
4. If you wish to answer any question already answered, cancel the previous answer.
5. In questions where internal choices is provided. You must attempt only one choice.

Pre-Board Examination 2009 -10

Time: 3 hrs. ***M.M.: 80***

CLASS – X MATHEMATICS

Section A

Q.1	After how many decimal places, will the decimal expansion of $\frac{23457}{2^3 \times 5^4}$ terminate?
Q.2	If the product of zeroes of the quadratic polynomial $p(x) = (k-2)x^2 - 4x + k$, is 3, write the value of k.
Q.3	What is the angle subtended at the centre of a circle of radius 7 cm, by an arc of length 11 cm?
Q.4	A card is drawn at random from a well shuffled deck of 52 cards. What is the probability of getting a black king?
Q.5	If $\tan(2A) = \cot(A - 21°)$, where 2A is an acute angle, then find the value of A.
Q.6	What is the probability that two friends have different birthdays?
Q.7	What is the exponent of 3 in the prime factorization of 864?
Q.8	The diameter and height of a cylinder and a cone are equal. Write the ratio of volume of cylinder to the volume of the cone .
Q.9	A ladder is placed against a wall such that its foot is at a distance of 2.5 m from the wall and its top reaches a window 6 m above the ground. Find the

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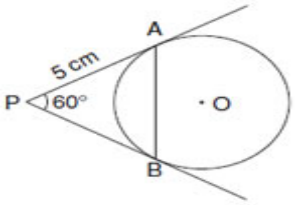
	length of the ladder.
Q.10	If $(0,b),\left(\frac{-a}{2},\frac{b}{2}\right)\&\left(\frac{a}{2},\frac{-b}{2}\right)$ are the mid-points of the sides of a triangle, find the coordinates of its centroid.
	Section B
Q.11	In two concentric circles, a chord of the larger circle touches the smaller circle. If the length of this chord is 8 cm and the diameter of the smaller circle is 6 cm, then find the diameter of the larger circle. Or In Fig. 3, PA and PB are two tangents drawn to a circle with centre O, from an external point P such that PA = 5 cm and $\angle APB = 60^0$. Find the length of  chord AB. Fig. 3 .
Q.12	Find the area of the quadrilateral ABCD formed by the points A(-1,-2) B(1,0) C(-1,2) and D(-3,0).
Q.13	Using Geometry, find the value of sin 60°.
Q.14	What real number should be subtracted from the polynomial $3x^3 + 10x^2 – 14x + 9$ so that the polynomial $3x – 2$ divides it exactly?
Q.15	Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are (2, 2), (4, 4) and (2, 6).
	Section C
Q.16	A game consists of tossing a one-rupee coin 3 times and noting its outcome each time. Vivaswan wins if all the tosses give the same result i.e. three heads or three tails, and loses otherwise. Calculate the probability that Vivaswan will lose the game.
Q.17	Draw a right triangle in which the sides (other than the hypotenuse) are of length 4cm and 3 cm. Then construct another triangle whose sides are $\frac{5}{3}$ times the corresponding sides of the given triangle.
Q.19	200 logs are stacked in the following manner : 20 logs in the bottom row , 19 in the next row , 18 in the row next to it and so on . In how many row , the 200 logs are placed and how many logs are in the top row ?
Q.18	Point P, Q, R and S in that order are dividing a line segment joining A(2, 6) and B(7, – 4) in five equal parts. Find the coordinates of P and R. Or

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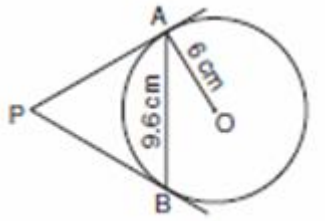
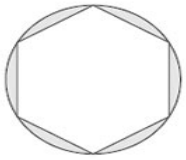
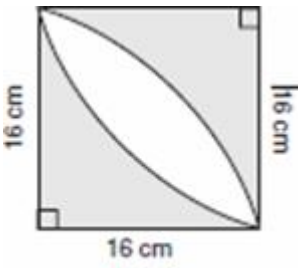
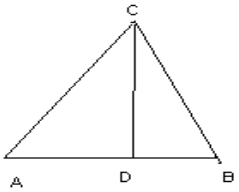
	A (– 4, – 2), B(– 3, – 5), C(3, – 2) and D(2, k) are the vertices of a quadrilateral ABCD. Find the value of k, if the area of the quadrilateral is 28 sq. units.
Q.19	In Fig. 4, AB is a chord of length 9.6 cm, of a circle with centre O and radius 6 cm. The tangents at A and B intersect at P. Find the length of PA.  Fig. 4 .
Q.20	A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random, from the jar, the probability that it is green is $\frac{2}{3}$,find the number of blue marbles in the jar.
Q.21	A round table cover has six equal designs as shown in Fig. 5. If the radius of the cover is 35 cm, then find the total area of the designs.  Fig. 5 . Or Calculate the area other than the area common between two quadrants of circles of radius 16 cm each, which is shown as the shaded region in Fig. 6.  Fig. 6
Q.22	Prove that : $(\sin^8\theta - \cos^8\theta) = (\sin^2\theta - \cos^2\theta)(1 - 2\sin^2\theta\cos^2\theta)$. **Or** Prove that : $(\sin\theta + \sec\theta)^2 + (\cos\theta + \cos ec\theta)^2 = (1 + \sec\theta.\cos ec\theta)^2$.
Q.23	In this figures, $\angle ACB = 90^0$ and CD $\perp$ AB.Prove that $\frac{CB^2}{CA^2} = \frac{BD}{AD}$ 
Q.24	Check graphically whether the pair of equations 3*x* + 5*y* = 15 and *x* – *y* = 5 is

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consistent. Also find the coordinates of the points where the graphs of the equations meet the *y*-axis.

Q.25 A gulabjamun contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 gulabjamuns shaped like a cylinder with two hemispherical ends with length 5cm and diameter 2.8cm.

Section D

Q.26 100 surnames were randomly picked from a local telephone directory and frequency distribution of the number of letters in the English alphabets in the surnames was obtained as follows:

Numbers of letters	Number of surnames
1-4	6
4-7	30
7-10	40
10-13	16
13-16	5
16-19	3

Determine the mean number of letter in the surname. Find the median number of letters in the surnames? Also find the modal size of the surnames.

Q.27 Prove that, in a triangle, if the square on one side is equal to the sum of squares of the other two sides, then the angle opposite to the first side is a right angle. Using the above, show that in an isosceles triangle ABC with AC = BC, if $AB^2 = 2AC^2$ then ABC is a right triangle.

Q.28 A boy, who's eye level is 1.3 m from the ground, spots a balloon moving with the wind in a horizontal line at some height from the ground. The angle of elevation of the balloon from the eyes of the boy at any instant is 60°. After 2 seconds, the angle of elevation reduces to 30°. If the speed of wind at that moment is 29 3 m/s, then find the height of the balloon from the ground.

Or

The angles of depression of the top and the bottom of a 9 m high buildling from the top of a tower are 30° and 60° respectively. Find the height of the tower and the distance between the building and the tower.

Q.29 A motorboat whose speed in still water is 5 km/h, takes 1 hour more to go 12 km upstream than to return downstream to the same spot. Find the speed of the stream.

Q.30 A farmer connects a pipe of internal diameter 25 cm from a canal into a cylindrical tank in his field, which is 12 m in diameter and 2.5 m deep. If water flows through the pipe at the rate of 3.6 km/h, in how much time will the tank be filled? Also find the cost of water, if the canal department charges at the rate of Rs. 0.07/m3.

OR

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	A container in the shape of a frustum of a cone having diameters of its two circular faces as 35 cm and 30 cm and vertical height 14 cm, is completely filled with oil. If each cm3 of oil has mass 1.2 g, then find the cost of oil in the container when it costs Rs. 40 per kg.
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