# Ashwani Gupta

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## Class – X                                                    Mathematics

**GENERAL INSTRUCTIONS:**

1.  *All questions are compulsory.*
2.  *The question paper consists of thirty four questions divided into four sections A, B, C & D. Section A comprises of ten questions of 01 marks each, Section B comprises of eight questions of 02 marks each, Section C comprises of ten questions of 03 marks each and section D comprises of six questions of 04 marks each.*
3.  *All questions in section A are multiple choice questions where you are to select one correct option out of given four.*
4.  *There is no overall choice. However internal choice has been provided in one question of 02 marks each, three questions of 03 marks each and two questions of 04 mark each. You have to attempt only one of the alternatives in all such questions.*
5.  *Use of calculators is not permitted.*

## Section – 'A'

1.  Which of the following equation has the sum of its roots as $-5$ ?
    (a)  $x^2 + 5x + 6$                      (b) $x^2 - 5x + 6$
    (c)  $x^2 - 5x - 6$                      (d) $x^2 - 5x - 8$
2.  The sum of the first 10 positive numbers:
    (a)  $-55$                               (b) $-54$
    (c)  $55$                                (d) $54$
3.  If the radii of the two consecutive circles are $50cm$ and $3cm$, then the length of each chord of one circle which is tangent to other is:
    (a)  $9cm$                               (b) $4cm$
    (c)  $8cm$                               (d) $18cm$
4.  If the radii of the circle is $4cm$ than the distance between the two parallel tangents is:
    (a)  $6cm$                               (b) $8cm$
    (c)  $10cm$                              (d) $5cm$
5.  Two tangents making an angle of $60°$ with each other, are drawn to a circle of radius $6cm$, than the length of each tangent is equal to:
    (a)  $\overline{3}cm$                    (b) $6 \ \overline{3}cm$
    (c)  $\overline{2}cm$                    (d) $2 \ \overline{3}cm$
6.  If two tangents PA & PB from a point P to a circle with centre O are inclined at each other at an angle of $60°$, then the ∠POA is:
    (a)  $120°$                              (b) $40°$
    (c)  $60°$                               (d) $50°$
7.  Metallic spheres of radii $6cm, 8cm, 10cm$ respectively are melted to form a single solid sphere, then the radius of the resulted sphere is:
    (a)  $18cm$                              (b) $24cm$
    (c)  $12cm$                              (d) $9cm$

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8. The base area of the two right of the circular cone of the same height are in the ratio $3:5$. The ratio of their volumes is:
   (a) $3:5$                                     (b) $9:25$
   (c) $27:125$                           (d) $5:3$

9. The shadow of a tower is $\sqrt{3}\ times$ the height of the tower, the angle of elevation of the sun is:
   (a) $60°$                                       (b) $30°$
   (c) $45°$                                       (d) none of these

10. A letter of English alphabet is chosen at random. The probability is that letter so choose is a vowel:
    (a) $\dfrac{9}{26}$                                 (b) $\dfrac{3}{26}$
    (c) $\dfrac{4}{26}$                                 (d) $\dfrac{5}{26}$

## Section – 'B'

11. If one root of the equation $3x^2 - kx - 2 = 0$ is 2, find the value of $k$. Also find the other root.

12. Which term of Arithmetic Progression 3, 10, 17… will be 84 more than its $13^{th}$ term?

13. The minute hand of the clock is $\overline{21}$cm long. Find the area described by the minute hand on the face of the clock between 7:00AM and 7:05AM.

14. In the figure, a circle touches the side BC of ΔABC at P & touches AB & AC produced at Q & R respectively. If AQ$= 5cm$, find the perimeter of ΔABC.
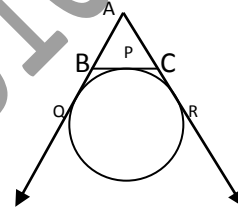


15. Find the point on the $x - axis$ which is equidistant from the points $-2,5$ & $2,-3$ .

16. Find a relation between $x$ and $y$ such that the point $(x, y)$ is equidistant from the points (7, 1) and (3, 5).

17. How many spherical bullets be made out of a spherical cube of lead whose edge measures 44cm, each bullet being 4cm in diameter? (use $\pi = \dfrac{22}{7}$)

18. A bag contains 3 red, 5 black and 7 white balls. A ball is drawn from the bag at random. Find the probability that the ball drawn is

    (1) White             (2) Red          (3) Not Black          (4) Red or White

    **OR**

    15 cards numbered $1, 2, 3…15$ are put in a box and mixed thoroughly. A card is drawn at random from the box. Find the probability that a card bears

    (1) An even no.                 (2) A no. divisible by $2\ or\ 3$

## Section – 'C'

19. Solve for $x$:

$$\frac{x+1}{x-1} - \frac{x-1}{x+1} = \frac{5}{6}, \quad x \neq 1, \quad x \neq -1$$

**OR**

The sum of a number & its positive square roots is $\dfrac{6}{25}$ . Find the number.

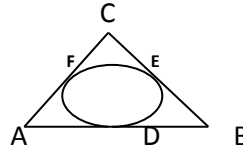20. Find the sum of first 15 terms of an A. P. whose $nth$ term is $9 - 5n$

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21.

A circle is inscribed in a ΔABC
having sides $8cm, 10cm, \& 12cm$.
Find AD, BE & CF.

**OR**

Two tangents TP & TQ are drawn to a circle with centre O from an external point T. prove that $\angle PTQ = 2\angle OPQ$

22. Draw a pair of tangents to a circle of radius 2cm that are inclined to each other at an angle of $90^0$

23. A solid metallic sphere of diameter 28cm is melted and recasted into a no. of small cones, each of diameters $4\frac{2}{3}\ cm$ and height 3cm. Find the no. of cones so formed.

**OR**

Water flows in the tank $150m \times 100m$ at the base through a pipe whose cross-section is 2dm by 1.5dm at the speed of 15km/hr. in what time the water be 3m deep?

24. In the given figure
Find the area of shaded region
When $AB = 12cm\ and\ AD = 5cm$.
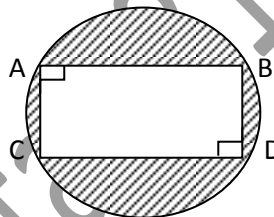
25. From the top of the tower 50m high the angles of the depression of the top and bottom of the pole are observed to be 45° & 60°. Find the height of the pole.

26. Find the value of $m$ for which the points with co-ordinates $(3,5), (m, 6)\ \&\frac{1}{2}, \frac{15}{2}$ are collinear

27. The line joining the points $(2,1)\ \& (5, -8)$ is trisected at the points $P\ \&Q$. If the $P$ point lies on the line $2x - y + k = 0$, find the value of $k$.

## Section – 'D'

28. All the three face cards of spades are removed from a well shuffled pack of 52 cards. A card is then drawn at random from the remaining pack of cards. Find the probability of getting
   (1) A black face card.            (2) A Queen            (3) A black card.

29. Prove that the intercept of a tangent between two parallel lines to a circle with the centre O subtends a right angle at the centre.

30. If the radii of the ends of the bucket, 45cm high are 28cm and 7cm, determine the capacity and total surface area of bucket.

## Or

A well with 10m inside diameter is dug 14m deep. Earth taken out of it and spread all around to a width of 5m to form a embankment. Find the height of the embankment.

31. A toy is in the shape of a right circular cylinder with a hemisphere on one end and a cone on the other. The radius and height of the cylindrical part at 5cm and 13cm respectively. The radius of the

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hemispherical part and the conical part is as same as that of cylindrical part. Find the surface area of toy if the total height of the toy is 30cm.

32. A speed of a boat in still water is 11km/gr. It can go 12km upstream & return downstream to the original point in 2hrs 45minutes. Find the speed of the stream

**Or**

A dealer sells an article for Rs. 24 & gains as much per cent as the cost price of the article. Find the cost of the article.

33. A manufacturer of TV sets produced 600 sets in the third year and 700 sets in the seventh year. Assuming that the production increases uniformly by a fixed number every year, find :
   (i) the production in the 1st year
   (ii) the production in the 10th year
   (iii) the total production in first 7 years

34. From a window (60m high above the ground) of a house in a street the angles of elevation & the depression of the top & the foot of another house on the opposite side of street are 60° & 45° respectively. Show that the height of the opposite house is $60(1 + \sqrt{3})$ metres.

## M. C. Q. Answers:

1. a
2. b
3. c
4. b
5. b
6. c
7. c
8. b
9. b
10. D

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