

Sample Paper – 2010

Class – X

Subject – Mathematics

Time: 3 hrs prepared By:
M.M. 80

General instructions:

1. All the questions are compulsory
2. The question paper consists of 30 questions divided into four sections A, B, C and D. Section A contain 10 questions of 1 mark each; section B contains 5 questions of 2 marks each, section C contains 10 questions of 3 marks each, section D contains 5 questions of 6 marks each.
3. There is no overall choice. However, an internal choice has been provided in one question of 2 marks, three questions of 3 marks each and two questions of 6 marks each.

SECTION A

- Q1. State fundamental theorem of arithmetic?
Q2. If $a_n = 2 - 2n$, find the value of 19th term of an AP.
Q3. Find the HCF of 40 and 130.
Q4. 1 is zero of $x^3 - k$, find the value of k.
Q5. Find the value of $2\sin 30^\circ / (\tan^2 45^\circ + \sec^2 45^\circ)$.
Q6. Find the value of k, if the equation $kx^2 + 4x + 4 = 0$ have real and equal roots.
Q7. Find the value of x, if the mean of 10, 15, 5, x, 8 is 20.
Q8. Find the 30th term of 10, 7, 4...
Q9. What is the probability of sure event?
Q10. Write the condition to be satisfied by q so that a rational number p/q has a terminating decimal expansion.

SECTION B

- Q11. Prove that for number $n \in \mathbb{N}$, 12^n end with the digit zero.
Q12. Two concentric circles are of radii 5 cm and 3 cm. find the length of the chord of the larger circle which touches the smaller circle.
Q13. Draw a circle of radius 6 cm from a point 10 cm away from its centre, construct the pair of tangents to the the circle and measure their lengths.
Q14. Find the value of k for which the following points are collinear, (7 , -2) , (5 , 1) , (3 , k)
Q15. If $\tan A = 4/3$ then find the value of $\sin A + \cos A / \operatorname{cosec} A$
OR
Evaluate $2 \cos 67^\circ / \sin 23^\circ - \tan 40^\circ / \cot 50^\circ - \sin 90^\circ$

SECTION C

Q16. 2 woman and 5 men can together finish a piece of embroidery in 4 days, while 3 woman and 6 men can finish it in 3 days. Find the time taken by 1 woman alone to finish the embroidery, and that taken by 1 man alone.

Q17. Draw the graphs of the equations $2x - y + 6 = 0$ and $4x + 5y - 16 = 0$. Also determine the coordinate of the vertices of the triangle formed by these lines and x axis.

OR

Find the value of k of for which the following system of equations has infinitely many solutions $12x + ky = k$, $kx + 3y = k - 3$

Q18. solve the equation by using quadratic formula.
 $abx^2 + (b^2 - ac)x - bc = 0$

OR

The sum of the squares of two consecutive natural numbers is 421. Find the numbers.

Q19. The n^{th} term of an AP is given by $a_n = 9 - 5n$, find the sum of first 15 terms of an AP.

Q20. Draw a pair of tangents to circle of radius 5 cm which are inclined to each other at an angle of 60° .

OR

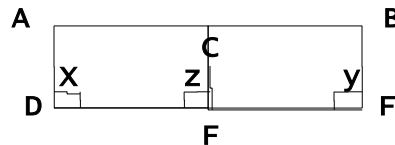
Prove that: $\tan A / (1 - \tan A) + \cot A / (1 + \tan A) = 1 + \sec A \cdot \operatorname{cosec} A$

Q21. Find the roots of the equation $9x^2 - 15x + 6 = 0$ by method of completing the square.

Q22. Prove that $(4, 3)$, $(6, 4)$, $(5, 6)$ and $(3, 5)$ are the vertices of a rhombus.

Q23. State and prove Basic Proportionality theorem.

By using theorem in the given figure prove that $1/x + 1/y = 1/z$



Q24. Water in a canal 6 m wide and 1.5 m deep is flowing with a speed of 10 km/h. how much area will it irrigate in 30 minutes, if 8 cm of standing water is needed.

Q25. Find the sum of all natural numbers between 100 and 500 which are divisible by 8.

SECTION D

Q26. Find the mean, median and mode of the following frequency distribution table

Classes:	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35
Frequency:	10	2	4	5	7	9

Q27. The angle of elevation of the bottom and top of a flag staff at the top of a building as seen from a point at a horizontal distance of

10 m from the foot of the building are 30° and 45° respectively. Find the height of the flag staff.

Q28. Prove that $(\tan A + \sec A - 1)/(\tan A - \sec A + 1) = (1 + \sin A)/\cos A$

OR

Solve: $4/(x + y) = 6 / (x - y) + 3$, $1 / 2 (x + y) = 1/ 3(x-y) + 3/2$

Q29. In $\triangle ABC$, AD is a median and AE is perpendicular to BC. If $BC = a$, $CA = b$, $AB = c$, $AD = p$, $AE = h$ and $DE = x$, prove that $b^2 + c^2 = 2p^2 + \frac{1}{2} a^2$.

Q30. Solve for x, $(2x + 2) / (x - 1) + (x - 2) / (x + 1) = 5 / 2$

OR

In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find

- (a) The length of an arc
- (b) Area of the sector formed by the arc
- (c) The area of the segment formed by the corresponding chord.

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