

Name NITESH KUMAR Class & Section X-A Roll No. 21
SINHA

UNITTEST-I—2017-18
CLASS-X
SUBJECT—MATHEMATICS

Time : 3 Hours

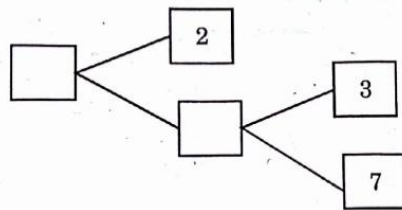
M.M. : 80

General Instructions :

- (1) The question paper is divided into four sections.
- (2) Section A consists of six questions of one mark each, Section B consists of six questions of two marks each, Section C consists of ten questions of three marks each and Section D consists of eight questions of four marks each.
- (3) All questions are compulsory.

Section-A

1. Complete the missing entries in the following factor tree.

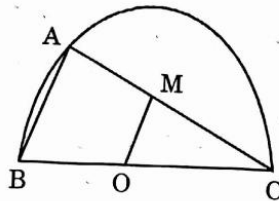


2. If two positive integers p and q are written as $p = ab^2$ and $q = a^3b$ where p and q prime numbers, then find the LCM (p, q).
3. Form a quadratic polynomial if the sum and product of its zeroes are $\frac{2}{3}$ and $-\frac{1}{9}$ respectively.
4. In $\triangle ABC$, $DE \parallel BC$ and $\frac{AD}{DB} = \frac{3}{5}$. If $AC = 4.8$ cm, find AE .
5. Find the value of k if the linear equations $4x + 7y = 10$ and $10x + ky = 26$ represent parallel lines.

6. If in $\triangle ABC$ and $\triangle DEF$, $\frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{FD} = \frac{2}{5}$, then find the ratio of areas of $\triangle ABC$ and $\triangle DEF$.

Section-B

7. Using Euclid's division lemma, check whether the numbers 81 and 237 are coprime.
8. If m and n are the zeroes of the polynomial $3x^2 + 11x - 4$, then find the value of $\frac{m}{n} + \frac{n}{m}$.
9. Find the length of the hypotenuse if the perimeter of right angled isosceles triangle is $\sqrt{2} + 1$.
10. If $2x + y = 35$ and $3x + 2y = 65$, find the value of $\frac{x}{y}$.
11. Arc BC is a semicircle with segment BC as diameter 'O' is the centre of semicircle and $OM \perp AC$, at point M. Prove that M is the mid point of AC.



12. Find the values of a and b for which the following system of linear equations represent co-incident lines :

$$(a - 1)x + 3y = 2$$

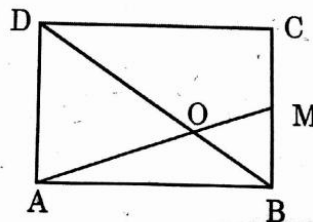
$$6x + (1 - 2b)y = 6$$

Section-C

13. ABCD is a rectangle in which M is the mid-point of BC and the diagonal BD meets AM at O. Prove that

(i) $\triangle BOM \sim \triangle DOA$

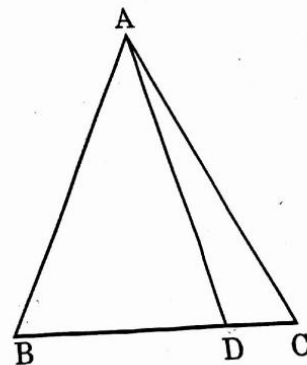
(ii) $DO = \frac{2}{3} BD$



14. If the zeroes of the polynomial $x^2 + px + q$ are double of the zeroes of $2x^2 - 5x - 3$ respectively, then find the values of p and q .
15. On a morning walk, three people start walking and their steps measure 40 cm, 42 cm, 45 cm respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps ?
16. The denominator of a fraction is 4 more than twice the numerator. When both the numerator and denominator are decreased by 6, then the denominator becomes 12 times the numerator. Determine the fraction.
17. On dividing $p(x) = 9x^4 - 4x^2 + 4$ by $g(x) = 3x^2 + x - 1$, the remainder is $ax - b$. Find a and b .
18. Prove that $\sqrt{2} + \sqrt{5}$ is irrational.
19. Prove that the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding medians.
20. Solve the system of linear equations :
 $231x + 148y = 527$; $148x + 231y = 610$
21. Prove that if x and y are both odd positive integers, then $x^2 + y^2$ is even but not divisible by 4.
22. Find the zeroes of the polynomial $4x^2 + 4x - 3$ and verify the relationship between the zeroes and coefficients of the polynomial.

Section-D

23. Prove that $\sqrt{7}$ is an irrational number.
24. Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then the other two sides are divided in the same ratio.
25. A point D is on the side BC of an equilateral triangle ABC such that $DC = \frac{1}{4} BC$. Prove that $AD^2 = 13 CD^2$.



26. Some villages of a city jointly established a trust for women and child welfare. In a school of the same area, 25 boys and 20 girls of class IX donated ₹ 7000 whereas 30 boys and 15 girls of class X donated ₹ 7500. Find the money donated by each boy and each girl.
27. Find all the zeroes of the polynomial $2x^4 - 10x^3 + 5x^2 + 15x - 12$, if two of its zeroes are $\sqrt{\frac{3}{2}}$ and $-\sqrt{\frac{3}{2}}$.
28. Draw the graphs of the linear equations, $4x - 3y - 6 = 0$ and $x + 3y - 9 = 0$. Also, determine the vertices of the triangle formed by the lines and the y-axis.
29. Solve graphically the following system of linear equations :
- $$2x + 7y = 14 \text{ and } 5x + \frac{35}{2}y = 25$$
- Is the system consistent or inconsistent ?
30. Sides AB and BC and median AD of a ΔABC are respectively proportion sides PQ and QR and median PM of ΔPQR . Show that $\Delta ABC \sim \Delta PQR$.