



INDIAN SCHOOL DARSAIT

MID TERM EXAMINATION , SEPTEMBER 2017

SAMPLE PAPER 2

MATHEMATICS

CLASS X

Max. Marks : 80

Date :

Time : 3hrs

General instructions:

- ❖ All questions are compulsory.
- ❖ The question paper consists of 30 questions divided into 4 sections- A,B,C and D.
Section A consists of **6** questions of **1 mark** each. **Section B** consists of **6** questions of **2marks** each. **Section C** consists of **10** questions of **3marks** each. **Section D** consists of **8** questions of **4 marks** each.
- ❖ There is no overall choice in the question paper.
- ❖ Use of calculator is not permitted.

SECTION A

Questions 1 to 6 carries 1 mark.

1. Use Euclid's division algorithm to find the H.C.F. of 870 and 225. 1
2. For what values of k the following system of equations will be inconsistent? 1
 $kx + 3y + (2-k) = 0$
 $12x + ky = k$
3. Solve by factorization : $\sqrt{35}x^2 - \left[\frac{5}{\sqrt{7}} + \frac{7}{\sqrt{5}} \right]x + 1 = 0$ 1
4. If the product of zeros of the polynomial $f(x) = ax^3 - 6x^2 + 11x - 6$ is 4, then find a. 1
5. Find the values of x in the Arithmetic series $3x+1, 5x-1, 5x+1, \dots$ 1
6. E and F are points on the sides PQ and PR respectively of a ΔPQR . For the following case , check whether $EF \parallel QR$: 1
 $PQ = 3 \text{ cm}$, $PR = 5.6 \text{ cm}$, $PE = 1.5 \text{ cm}$ and $PF = 2.8 \text{ cm}$

SECTION B

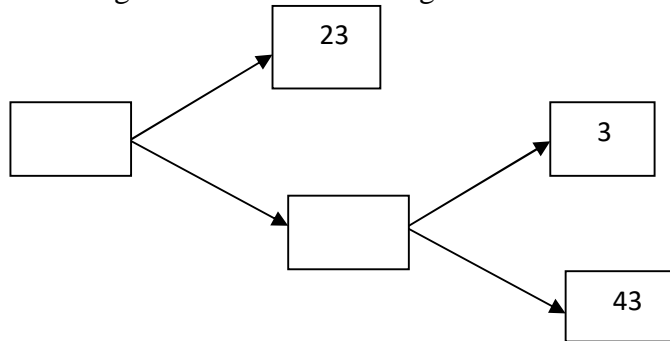
Questions 7 to 12 carries 2 marks

7. Find the zeros of the quadratic polynomial $4\sqrt{3}x^2 + 5x - 2\sqrt{3}$ and verify the relation 2

between the zeros.

8. α and β are the roots of the quadratic polynomial $p(x) = x^2 - (k + 6)x + 2(2k - 1)$. Find the value of k , if $\alpha + \beta = \frac{1}{2} \alpha\beta$. 2

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



10. The difference of squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers. 2
11. For an arithmetic progression $S_n = 20$ and $S_m = 10$ and $n - m = 1$. Prove that $n = \frac{10}{a}$ when $a = d$. 2
12. D and E are points on the sides AB and AC respectively of a ΔABC such that $DE \parallel BC$. Find the value of x when $AD = x$ cm, $DB = (x - 2)$ cm, $AE = (x + 2)$ cm and $EC = (x - 1)$ cm. 2

SECTION C

Questions 13 to 22 carries 3 marks.

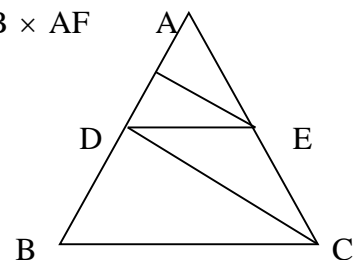
13. Prove that $2\sqrt{7} - 5$ is irrational. 3
14. What must be added to the polynomial $9x^4 - 4x^2 + 4$, so that the resulting polynomial is exactly divisible by $3x^2 + x - 1$? 3
15. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - 2x + 1$, find a quadratic polynomial whose zeroes are $\frac{2\alpha}{\beta}$ and $\frac{2\beta}{\alpha}$. 3
16. For what values of a and b does the following pairs of linear equations have an infinite number of solutions:
 $2x + 3y = 7$; $a(x + y) - b(x - y) = 3a + b - 2$ 3

17. The diagonals of a quadrilateral ABCD intersect each other at the point O such that $\frac{AO}{BO} = \frac{CO}{DO}$. Show that ABCD is a trapezium. 3
18. If S_n denotes the sum of n terms of an AP & if $S_1 = 6$ & $S_7 = 105$, then show that $S_n : S_{(n-3)} = (n+3):(n-3)$. 3
19. Find the three numbers in A.P whose sum is 21 and sum of their squares is 179 3
20. Find the value of k so that $(k + 4)x^2 + (k + 1)x + 1 = 0$ has equal roots. 3
21. Solve $99x + 101y = 499$
 $101x + 99y = 501$ 3
22. Find the roots of equations $5x^2 - 6x - 2 = 0$ by the method of completing the perfect square. 3

SECTION D

Questions 23 to 30 carries 4 marks.

23. Show that product of 3 consecutive natural numbers is divisible by 6. 4
24. Obtain all the zeros of $x^4 + 4x^3 - 2x^2 - 20x - 15$, if two of its zeros are $\sqrt{5}$ and $-\sqrt{5}$. 4
25. On dividing $x^3 - 3x^2 + x + 2$ by the polynomial $g(x)$, the quotient and remainder were $x - 2$ and $-2x + 4$ respectively. Find $g(x)$. 4
26. A boat goes 12km upstream and 40km downstream in 8 hours. It can go 16km upstream and 32km downstream in the same time. Find the speed of the boat in still water and the speed of the stream. 4
27. Drupad finds it difficult to solve the following problem. A polygon of 31 sides, the length of which starting from the smallest are in A.P. if perimeter of polygon is 527 & length of largest is 16 times the smallest side. Find the common difference & smallest side. Drupad's friend Deva helped him in solving it. What was his solution? Which value is depicted here? 4
28. In figure, $DE \parallel BC$ and $CD \parallel EF$. Prove that $AD^2 = AB \times AF$ 4



29. Solve for x: $\frac{1}{p+q+x} = \frac{1}{p} + \frac{1}{q} + \frac{1}{x}$ 4
30. If S1 , S2 and S3 be the sum of n,2n and 3n terms respectively of an A. P. prove that S3 = 3(S2 – S1). 4

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