INDIAN SCHOOL DARSAIT
MID TERM EXAMINATION, SEPTEMBER 2019
SAMPLE QUESTION PAPER
MATHEMATICS

Class : X   Max Marks :80
                                                                              Time : 3 hrs

General Instructions:

(i)   All questions are compulsory.
(ii)   The question paper consists of 40 questions divided into four sections A, B, C, and D. Section A comprises of 20 questions of 1 mark each, section B comprises of 6 questions of 2 mark each, section C comprises of 8 questions of 3 mark each , section D comprises of 6 questions of 4 mark each.
*(iii)   There is no overall choice. However, an internal choice has been provided in **two** questions of 2 marks each and **two** questions of 3 marks each and **one** question of 4 marks. You have to attempt **only one** of the alternatives in all such questions.*
(iv)   Use of calculator is not permitted.

SECTION - A

Question numbers 1 to 10 carry one mark each. For each of these questions four alternative choices have been provided of which only one is correct. Select the correct choice.

1.   The values of x and y in the given figure are: 1

(a) x = 10; y = 14   (b) x = 21; y = 84   (c) x = 21; y = 25 (d) x = 10; y = 40

2.   The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is :   1
 (a) 10   (b) 100   (c) 504   (d) 2520

3.   A polynomial of degree n has   1
 (a)only 1 zero   (b) exactly n zeroes   (c) atmost n zeroes   (d) more than n zeroes

4.   Five years ago, A was thrice as old as B and ten years later, A shall be twice as old as B. What is the present age of A.   1
   (a) 20   (b) 50   (c) 60   d) 40

5.   The roots of the equation $9x^2 - bx + 81 = 0$ will be equal, if the value of b is   1
        (a) ± 9 (b) ± 18 (c) ± 27 (d) ± 54

6.   Sum and product of roots of equation $x^2 - kx + k^2 = 0$ are   1

(a) k, k²   (b) k², k   (c) −k, k²   (d)k, −k²

7. 30th term of the AP : 10, 7, 4,….. is   1
   (a) 97   (b) 77   (c) -77   (d) -87
8. The sum of first five multiples of 3 is: 1
   (a) 45   (b) 55   (c) 65   (d) 75
9. ABC and BDE are two equilateral triangles such that D is the midpoint of BC. Ratio   1
   of the areas of triangles ABC and BDE is :
   (a) 2:1   (b) 1: 2   (C) 4: 1   (d)1:4

10. In triangles ABC and DEF ∠ B = ∠ E, ∠ F =∠ C and AB = 3DE. Then the two   1
    triangles are :
    (a) Congruent but not similar
    (b) Similar but not congruent
    (c) Neither congruent nor similar
    (d) Congruent as well as similar.
    <u>Question numbers 11 to 15 carry 1 mark each. Write whether the statements are true
    or false.</u>
11. Product of two prime number is always equal to their LCM.   1

12. (2x+6y=12) and (8x+24y=65) are consistent pair of equations   1

13. For k > 0,the quadratic equation $2x^2 + 6x−k=0$ will definitely have real roots.   1

14. In the AP: 10, 5, 0, −5, ... the common difference d is equal to 5.   1

15. If $\Delta DEF \sim \Delta RPQ$, then $\angle D = \angle R$ and $\angle F = \angle P$ 1

<u>Question numbers 16 to 20 carry 1 mark each.</u>

16. If two positive integers p and q can be expressed as $p = ab^2$ and $q= a^3b$; a and b being   1
    prime numbers, find LCM of (p,q).
17. If α and β are the zeroes of a polynomial , such that α + β = 6 and αβ = 4, then write   1
    the polynomial.
18. Find the value of m for which the pair of linear equations 2x + 3y − 7 =0 and   1
    (m-1)x + (m + 1)y = (3m − 1) has infinitely many solutions.

19. If one root of the quadratic equation $5x^2 + 13x +k = 0$ is the reciprocal of the other ,   1
    then find the value of 'k'.
20. For what value of k will the consecutive terms 2k + 1, 3k + 3 and 5k − 1 form an AP?   1

SECTION – B
Question numbers 21 to 26 carry 2 marks each.
21. Using Euclid's algorithm , find the HCF of 240 and 228.   2
                              OR
    For any natural number n check whether 6^n end with digit 0.

22. If 3 is a zero of the polynomial $x^4 – 3x^3 – 7x^2 + 15x + k$, find 'k'.   2

23. Find whether the lines representing the following pair of linear equations intersect at a point or parallel or coincident.
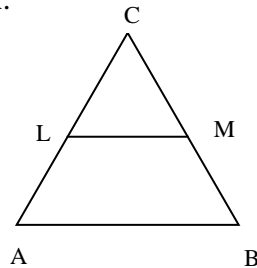$2x - 3y + 6 = 0$, $4x - 5y + 2 = 0$

2

24. Find the roots of the quadratic equation $\sqrt{2}\, x^2 + 7x + 5\sqrt{2} = 0$

2

25. If 5th term of an AP is zero, show that 33rd term is four times its 12th term.

2

OR

The nth term of an AP is $6n + 11$. Find the common difference.

26. In the given figure LM is parallel to AB. If AL= x-3, AC = 2x, BM = x-2 and BC = 2x + 3, find x.

2

SECTION – C
Question numbers 27 to 34 carry 3 marks each.

27. Show that only one of the numbers n, n+2 or n+4 is divisible by 3.

3

28. Find the zeros of the polynomial $4\sqrt{3}\, x^2 + 5x - 2\sqrt{3}$, and verify the relationship between the zeros and co-efficients.

3

29. If α and β are the zeroes of the polynomial $2x^2 + 5x + k$ such that $\alpha^2 + \beta^2 + \alpha\beta = \frac{21}{4}$, then find the value of k.
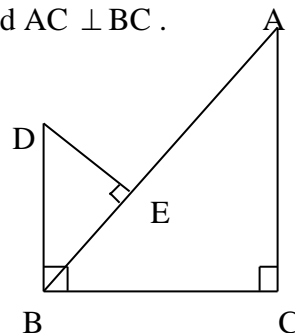
3

OR

What must be added to the polynomial $9x^4 - 4x^2 + 4$ so that the resulting polynomial is exactly divisible by $3x^2 + x - 1$?

30. D and E are points on the sides CA and CB respectively of a triangle ABC right angled at C . Prove that $AE^2 + BD^2 = AB^2 + DE^2$

3

OR

In the adjoining figure , DB $\perp$ BC , DE $\perp$ AB and AC $\perp$ BC .
Prove that $\dfrac{BE}{DE} = \dfrac{AC}{BC}$

31. Solve: $99x + 101y = 499$
$101x + 99y = 501$

3

32. Write a quadratic equation whose roots are $\frac{2+\sqrt{5}}{2}$ and $\frac{2-\sqrt{5}}{2}$

3

33. A sum of Rs.700 is to be used to give seven cash prizes to students of a school for their overall academic performance. If each prize is Rs 20 less than its preceding prize, find the value of each of the prizes.

3

34. Divide 56 in four parts in AP such that the ratio of the product of their extremes (1st and 4th) to the product of middle (2nd and 3rd) is 5:6.

3

SECTION – D
Question numbers 35 to 40 carry 4 marks each.

35. Prove that $2 + \sqrt{5}$ is an irrational number .

4

36. If -1 is one of the zeroes of the cubic polynomial $15x^3 + 14x^2 -3x – 2$, then find the other two zeroes of the polynomial.

4

37. 4 men and 6 boys can finish a piece of work in 5 days while 3 men and 4 boys can finish it in 7 days. Find the time taken by 1 man alone or that by 1 boy along.
    OR
The present age of the father is twice the sum of the ages of his 2 children. After 20 years, his age will be equal to the sum of the ages of his children. Find the age of the father.

4

38. Speed of the boat in still water is 15km/h. It goes 30km upstream and returns back at the same point in 4 hours 30 minutes. Find the speed of the stream.

4

39. The sum of the 5th and 9th terms of an AP is 72 and the sum of the 7th and 12th terms is 97. Find the AP.

4

40. In ΔABC, if $\angle$ ADE = $\angle$ B, then prove that $\Delta ADE \sim \Delta$ ABC. Also if AD = 7.6cm, AE= 7.2cm, BE = 4.2cm and BC = 8.4cm, then find DE.

4