CBSE

REAL NUMBERS WS 1

Class 10 - Mathematics

Section A

1. If HCF of two numbers is 1, the two numbers are called relatively _____ or _____. **[1]**

    a) composite, co-prime

    b) composite, prime

    c) prime, co-prime

    d) twin primes, square numbers

Section B

2. Match the following: **[2]**

(a) HCF(12,24)	(i) Rational Number
(b) LCM(12,24)	(ii) Irrational Number
(c) $\sqrt{2}$	(iii) 12
(d) $\sqrt{9}$	(iv) 24

Section C

3. Find the LCM and HCF of 336 and 54 and verify that LCM $\times$ HCF = product of two numbers. **[3]**

4. Find the HCF of 506 and 1155 and express it as a linear combination of them. **[3]**

5. If the HCF of 657 and 963 is expressible in the form of $657x + 963 \times (-15)$, find the value of x. **[3]**

6. If d is the HCF of 30 and 72, find the values of x and y satisfying d = 30x + 72y **[3]**

7. In the Hospital The nurse is supposed to monitor a patient after 84min another at 90 min and the third one at 120 min. For this, she set up alarms accordingly. At what time will all her alarms ring at the same time? **[3]**

8. On morning walk, three persons step off together and their steps measure 40 cm, 42 cm and 45 cm, respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps? **[3]**

9. Find the LCM and HCF of 404 and 96 and verify that LCM × HCF = product of the two numbers **[3]**

10. Find the LCM and HCF of 26 and 91 and verify that LCM $\times$ HCF = product of two numbers. **[3]**

11. Renu is giving away some packs of fruits to the charity. She has 45 oranges and 20 pears. She needs to calculate the maximum number of packs she can make out of the number of fruits available such that the fruits are equally distributed among the packs. **[3]**

12. Define HCF of two positive integers and find the HCF of the pair of numbers: 475 and 495. **[3]**

13. Is it possible to design a rectangular park of perimeter 80 metres and area 400 m^2. If so, find its length and breadth. **[3]**

14. Mrs. Gupta arranged some snacks for her child's birthday party. After the guest left she had some food left over. She did not want to waste food and so she contacted a local NGO. She gave 60 pieces of pastries,168 pieces of cookies, and 330 chocolate bars to the team. Now the NGO workers want to make the maximum number of packets with those foods so that no food is left for distributing to the beggars at the roadside. Find the greatest number of packets that they can make. **[3]**

15. If (x–3) is the HCF of $x^3 - 2x^2 + px + 6$ and $x^2 - 5x + q$, find 6p + 5q **[3]**

16. Mr. Patil has three classes. Each class has 28, 42 and 56 students respectively. Mr Patil wants to divide each class into groups so that every group in every class has the same number of students and there are no students left over. What is the maximum number of students Mr. Patil can put into each group? **[3]**

17. 144 cartons of Coke cans and 90 cartons of Pepsi cans are to be stacked in a canteen. If each stack is of the same height and if it equal contain cartons of the same drink, what would be the greatest number of cartons each stack would have? **[3]**

18. There are 156, 208 and 260 students in groups A, B and C respectively. Buses are to be hired to take them for a field trip. Find the minimum number of buses to be hired, if the same number studets should be accommodated in each bus. **[3]**

19. Show that there are infinitely many positive primes. **[3]**

20. Find the HCF and LCM of the following positive integers by applying the prime factorization method: 15, 55, 99 **[3]**

21. Define HCF of two positive integers and find the HCF of the pair of numbers: 75 and 243. **[3]**

22. Find the HCF of 65 and 117 and find a pair of integral values of m and n such that HCF = 65m + 117n. **[3]**

23. For a morning walk, three persons steps off together. The measure of their steps is 80,85 and 90 cm respectively.What is the minimum distance each should walk so that all can cover the same distance in complete steps?

    Which value is preferred in this situation? **[3]**

24. If (x–k) is the HCF of $\left(2x^2 - kx - 9\right)$ and $x^2 + x - 12$, find the value of k. **[3]**

25. Mika exercises every 12 days and Nanu every 8 days. Mika and Nanu both exercised today. How many days will it be until they exercise together again? **[3]**

26. A shopkeeper has 120 litres of petrol, 180 litres of diesel and 240 litres of kerosene. He wants to sell oil by filling the three kinds of oils in tins of equal capacity. What should be the greatest capacity of such a tin? **[3]**

27. The traffic lights at three different road crossings change after every 48 seconds, 72 seconds and 108 seconds respectively. If they all change simultaneously at 8 a.m. then at what time will they again change simultaneously? **[3]**

28. Find the greatest number that will divide 445, 572 and 699 leaving remainders 4, 5 and 6 respectively. **[3]**

29. Express the HCF/GCD of 48 and 18 as a linear combination. **[3]**

30. Ankit is printing orange and green forms. He notices that 3 orange forms fit on a page, and 5 green forms fit on a page. If Ankit wants to print the exact same number of orange and green forms, what is the minimum number of each form that he could print? **[3]**

31. What is the smallest number that, when divided by 35, 56 and 91 leaves remainders of 7 in each case? **[3]**

32. 105 goats, 140 donkeys and 175 cows have to be taken across a river. There is only one boat which will have to make many trips in order to do so. The lazy boatman has his own conditions for transporting them. He insists that he will take the same number of animals in every trip and they have to be of the same kind. He will naturally like to take the largest possible number each time. Can you tell how many animals went in each trip? **[3]**

33. Find the largest number that will divide 398, 436 and 542 leaving remainders 7,11 and 15 respectively. **[3]**

34. Explain why $7 \times 11 \times 13 + 13$ and $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ are composite numbers. **[3]**

35. Three sets of English, Hindi and Mathematics books have to be stacked in such a way that all the books are stored topic wise and the height of each stack is the same. The number of English books is 96, the number of Hindi books is 240 and the number of Mathematics books is 336. Assuming that the books are of the same thickness, determine the number of stacks of English, Hindi and Mathematics books. **[3]**

36. Renu has collected 8 U.S. stamps and 12 international stamps. She wants to display them in identical groups of **[3]**

U.S. and international stamps, with no stamps left over. What is the greatest number of groups Renu can display them in?

37. Maya has two pieces of cloth. One piece is 36 inches wide and the other piece is 24 inches wide. She wants to cut both pieces into strips of equal width that are as wide as possible. How wide should she cut the strips? **[3]**

38. In a morning walk, three persons step off together. Their steps measure 80 cm, 85 cm and 90 cm respectively. What is the minimum distance each should walk so that all can cover the same distance in complete steps? **[3]**

39. In a school there are two sections, namely A and B, of class X. There are 30 students in section A and 28 students in section B. Find the minimum number of books required for their class library so that they can be distributed equally among students of section A or section B. **[3]**

40. Shekar wants to plant 45 corn plants, 81 tomato plants, and 63 ginger plants. If he plants them in such a way that each row has the same number of plants and each row has only one type of plant, what is the greatest number of plants he can plant in a row? **[3]**

41. There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time and go in the same direction. After how many minutes will they meet again at the starting point? **[3]**

42. A wine seller had three types of wine. 403 liters of 1st kind, 434 liters of 2nd kind and 465 liters of 3rd kind. Find the least possible number of casks of equal size in which different types of wine can be filled without mixing. **[3]**

43. Find the HCF and LCM of the following pairs of positive integers by applying the prime factorization method: 72, 90 **[3]**

44. Find the LCM of the following polynomials: $x\left(8x^3 + 27\right)$ and $2x^2\left(2x^2 + 9x + 9\right)$ **[3]**

45. Define HCF of any two positive integers and find the HCF of the pair of numbers: 32 and 54 **[3]**

46. A mason has to fit a bathroom with square marble tiles of the largest possible size. The size of the bathroom is 10 ft. by 8 ft. What would be the size (in inches) of the tile required that has to be cut and how many such tiles are required? **[3]**

47. Amita, Suneha and Raghav start preparing cards for greeting each person of an old age home on new year. In order to complete one card, they take 10, 16 and 20 minutes respectively. If all of them started together, after what time will they start preparing a new card together ? Why do you think there is a need to show elders that the young generation cares for them and remembers the contribution made by them in the prime of their life? **[3]**

48. Define HCF of two positive integers and find the HCF of the pair of numbers: 155 and 1385. **[3]**

49. In order to promote reading habits among students, a school organized a Library Week. As part of the celebration, three genres of books: Biography, Mystery, and Self-help books were bought. For optimum arrangement, the organizers have stacked the books in such a way that all the books are stored topic-wise and the height of each stack is the same. The number of Biography books is 96, the number of Mystery books is 240 and the number of Self-help books is 336. Assuming that the books are of the same thickness, determine the number of stacks of Biography, Mystery, and Self-help books. **[3]**

50. Find the values of a and b if the HCF of the polynomials. **[3]**
$$f(x) = (x + 3)\left(2x^2 - 3x + a\right)$$
and $g(x) = (x - 2)\left(3x^2 + 10x - b\right)$ is $(x+3)(x-2)$

Section D

Question No. 51 to 54 are based on the given text. Read the text carefully and answer the questions: **[4]**

February 14 is celebrated as International Book Giving Day and many countries in the world celebrate this day. Some people in India also started celebrating this day and donated the following number of books of various subjects to a public library:

History = 96, Science = 240, Mathematics = 336.

These books have to be arranged in minimum number of stacks such that each stack contains books of only one subject and the number of books on each stack is the same.

51. How many books are arranged in each stack?

52. How many stacks are used to arrange all the Mathematics books?

53. Determine the total number of stacks that will be used for arranging all the books.

54. If the thickness of each book of History, Science and Mathematics is 1.8 cm, 2.2 cm and 2.5 cm respectively, then find the height of each stack of History, Science and Mathematics books.

Question No. 55 to 58 are based on the given text. Read the text carefully and answer the questions: [4]

To enhance the reading skills of grade X students, the school nominates you and two of your friends to set up a class library. There are two sections- section A and section B of grade X. There are 32 students in section A and 36 students in section B.

55. What is the minimum number of books you will acquire for the class library, so that they can be distributed equally among students of Section A or Section B?

56. If the product of two positive integers is equal to the product of their HCF and LCM is true then, the HCF (32, 36) is

57. $7 \times 11 \times 13 \times 15 + 15$ is a

58. If p and q are positive integers such that $p = ab^2$ and $q = a^2b$, where a, b are prime numbers, then the LCM (p, q) is

Question No. 59 to 62 are based on the given text. Read the text carefully and answer the questions: [4]

Khushi wants to organize her birthday party. Being health conscious, she decided to serve only fruits in her birthday party. She bought 36 apples and 60 bananas and decided to distribute fruits equally among all.

59. How many guests Khushi can invite at the most?

60. How many apples and bananas will each guest get?

61. If Khushi decides to add 42 mangoes, how many guests Khushi can invite at the most?

62. If the cost of 1 dozen of bananas is ₹ 60, the cost of 1 apple is ₹ 15 and cost of 1 mango is ₹ 20, find the total amount spent on 60 bananas, 36 apples and 42 mangoes.

Question No. 63 to 66 are based on the given text. Read the text carefully and answer the questions: **[4]**

A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.

63. What is the maximum number of participants that can be accommodated in each room if there are multiple rooms, and in each room, the same number of participants are to be seated, and all of them are in the same subject?

64. What is the minimum number of rooms required during the event?

65. Show that the product of two numbers 60 and 84 is equal to the product of their HCF and LCM.

66. What is the LCM of two numbers if their product is 1080 and their HCF is 30?

Section E

67. Find the HCF of 592 and 252 and express it as a linear combination of them. **[5]**

68. Explain why the numbers $8 \times 7 \times 6 \times 5 \times 4 + 5 \times 4$ and $11 \times 13 \times 15 + 11$ are composite numbers? **[5]**

69. State Fundamental theorem of Arithmetic. Find LCM of numbers 2520 and 10530 by prime factorization method. **[5]**

70. The product of three consecutive positive integers is divisible by 6. Is this statement true or false? Justify your answer. **[5]**

71. Three sets of physics, chemistry and mathematics books have to be stacked in such a way that all the books are stored topic wise and the number of books in each stack is the same. The number of physics books is 192, the number of chemistry books is 240 and the number of mathematics books is 168. Determine the number of stacks of physics, chemistry and mathematics books. **[5]**

72. On dividing the polynomial $4x^4$ - $5x^3$ - $39x^2$- 46x - 2 by the polynomial g(x), the quotient is x^2 - 3x - 5 and the remainder is - 5x + 8. Find the polynomial g(x). **[5]**

73. If the HCF of 210 and 55 is expressible in the form $210 \times 5 + 55y$, find y. **[5]**

74. If the HCF of 152 and 272 is expressible in the form $272 \times 8 + 152x$, then find x. **[5]**

75. Find the LCM of 2.5, 0.5 and 0.175. **[5]**