

EDUFEST JUNIOR BAVDHAN PUNE

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CLASS 6 MATHEMATICS

PRIME TIME (Vacation Worksheet)

SECTION A — Multiple Choice Questions (MCQs) [1 mark each | Total: 10 marks]

- Which of the following numbers is NOT a prime number?
(a) 97 (b) 91 (c) 83 (d) 79
- The HCF of two numbers is 12 and their product is 2160. What is their LCM?
(a) 180 (b) 48 (c) 144 (d) 108
- If the LCM of two co-prime numbers x and y is 210, then the product $xy =$
(a) 105 (b) 420 (c) 210 (d) Cannot be determined
- The smallest number which when diminished by 4 is divisible by 12, 24, 36 and 48 is:
(a) 144 (b) 148 (c) 1440 (d) 1444
- Which of the following pairs are twin primes between 1 and 50?
(a) (11, 15) (b) (17, 19) (c) (23, 27) (d) (29, 33)
- The number of prime numbers between 1 and 50 is:
(a) 12 (b) 15 (c) 16 (d) 10
- Which of the following statements is TRUE?
(a) If a number is divisible by 9, it is divisible by 3
(b) HCF of two consecutive odd numbers is always 2
(c) Every composite number is odd
(d) 1 is a prime number
- 6 is called a perfect number because:
(a) It has exactly 4 factors (b) Sum of all its factors (excluding itself) equals 6
(c) It is divisible by 3 (d) It is a composite number
- Three numbers are in the ratio 2:3:4 and their HCF is 5. The LCM of the three numbers is:
(a) 60 (b) 120 (c) 30 (d) 20
- A number N when divided by 12, 18 and 27 leaves remainder 3 each time. The smallest such N is:
(a) 108 (b) 111 (c) 57 (d) 54

SECTION B — Fill in the Blanks [1 mark each | Total: 10 marks]

- The only even prime number is _____
- The smallest odd composite number is _____
- The HCF of two consecutive natural numbers is always _____
- If $\text{HCF}(a, b) = 1$, then a and b are called _____ numbers.
- The LCM of 15 and 4 is _____. (Verify: $\text{HCF} \times \text{LCM} = \text{product of numbers}$:
_____)
- Express 57 as the sum of three odd primes: $57 = \underline{\quad} + \underline{\quad} + \underline{\quad}$
- The prime factorisation of 720 is _____. Hence $\text{HCF}(720, 540) = \underline{\quad}$
- There are _____ prime numbers between 80 and 100.

19. A number is divisible by 11 if the difference between the sum of digits in odd positions and even positions is _____
20. The LCM of the first five natural numbers (1 to 5) is _____

SECTION C — Short Answer Questions [2 marks each | Total: 20 marks]

21. Find all twin prime pairs between 1 and 50.
22. Write five pairs of co-prime numbers. Are co-primes always prime? Justify with an example.
23. Express 60 as the sum of two odd primes in three different ways.
(a) $60 = \underline{\quad} + \underline{\quad}$ (b) $60 = \underline{\quad} + \underline{\quad}$ (c) $60 = \underline{\quad} + \underline{\quad}$
24. Using the divisibility test, check whether 5,47,83,962 is divisible by (a) 3 (b) 9 (c) 11.
25. Find the prime factorisation of 5460 using a factor tree. Express the answer using prime exponents.
Factor tree working:
26. The LCM and HCF of two numbers are 240 and 8 respectively. If one number is 48, find the other number. Verify using the formula: $\text{LCM} \times \text{HCF} = \text{Product of numbers}$.
27. Can two numbers have 18 as their HCF and 400 as their LCM? Give a mathematical reason.
28. A merchant has 84 litres, 126 litres and 168 litres of three kinds of oil. He wants to fill them in tins of equal capacity. Find the greatest capacity of each tin.
29. Three lights blink at intervals of 6 seconds, 9 seconds, and 12 seconds. If they blink together at 12:00 PM, when will they next blink together?
30. Using Goldbach's conjecture, express the following as sum of two primes:
(a) $36 = \underline{\quad} + \underline{\quad}$ (b) $72 = \underline{\quad} + \underline{\quad}$ (c) $90 = \underline{\quad} + \underline{\quad}$

SECTION D — Long Answer / Problem Solving [5 marks each | Total: 30 marks]

31. Find the HCF and LCM of 18, 24, 40 and 45 using prime factorisation. Also verify: $\text{LCM} \times \text{HCF} = \text{product of numbers}$ (for any two of these).
32. In a seminar, participants in Mathematics, Physics and Chemistry are 72, 108 and 135 respectively. Find the minimum number of rooms required so that each room has the same number of participants, all of the same subject.
33. Six bells toll together and then toll at intervals of 3, 5, 6, 9, 10 and 15 minutes respectively. In 24 hours, how many times do they toll together (excluding the first toll)?
34. A floor measures 6 m \times 4.5 m. Find the minimum number of square marble slabs of equal size needed to cover the floor completely without cutting.
35. 148 cows, 185 sheep and 259 goats are to be taken across a river. The boatman will take the same number and same kind of animals in each trip. Find (a) the largest number of animals per trip and (b) the total number of trips needed.
36. Find the smallest number which when divided by 18, 27 and 36 gives a remainder of 7 each time. Also find the smallest number which is exactly divisible by 18, 27 and 36.

SECTION E — HOTS & Challenge Problems [5 marks each | Total: 10 marks]

37. HOTS: A school has 280 English, 160 Hindi and 120 Urdu books to be arranged in stacks of equal size. Each stack must contain only books of one subject. Find (a) the maximum stack size, (b) the number of stacks of each language, and (c) total stacks.
38. HOTS PUZZLE: A number between 1 and 200 has the following properties: Its prime factorisation contains exactly three distinct prime factors; The sum of its digits is divisible by 9; It is divisible by both 4 and 9. Find all such numbers and give their complete prime factorisations.