# Mathematics

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**(Chapter – 1) (Real Numbers) (Practice Test 4)**

**(Class X)**

**Time: 1 hour 15 minutes** **M. M: 25**

**General Instructions:**

- This question paper contains four sections: A, B, C and D. Each part is compulsory.
- Section A has 5 MCQ of one mark each.
- Section B has 3 questions of two marks each.
- Section C has 3 questions of three marks each.
- Section D has 2 questions of five marks each, attempt any 1 out of 2.
- There is no negative marking.

**[Section – A]**

1. The product of three consecutive integers is divisible by
   (A) 6 (B)7
   (C)5 (D) none of these
2. $n^2 - 1$ is divisible by 8, if n is
   (A) an odd integer (B) an even integer
   (C) a natural number (D) an integer
3. Euclid's division lemma states that for two positive integers a & b, there exist unique integers q and r such that a = bq + r, where r must satisfy
   (A) $0 \le r < b$ (B) $0 < r < b$
   (C) $1 < r < b$ (D) none of these
4. The largest number which exactly divides 70, 80, 105, 160 is
   (A) 5 (B) 7
   (C) 6 (D) none of these
5. HCF of $(x^3 - 3x + 2)(x^2 - 4x + 3)$
   (A) $(x - 1)$ (B) $(x - 1)(x - 3)$
   (C) $(x - 1)(x + 2)$ (D) $(x - 2)^3$

**[Section – B]**

6. Prove that if x and y are odd positive integers, then $x^2 + y^2$ is even but not divisible by 4.
7. Any contingent of 616 members is to march behind an army band of 32 members in a parade. The two groups are to march in the same number of columns. What is the maximum number of columns in which they can march?
8. Two tankers contain 850 litres and 680 litres of petrol respectively. Find the maximum capacity of container which can measure the petrol of either tanker in exact number of times?

**[Section – C]**

9. Show that every positive integer is of the form 2q, and that every positive odd integer is of the form 2q + 1, where q is some integer.

10. Use Euclid's division algorithm to find the HCF of 4052 and 12576.
11. Show that $n^2 - 1$ is divisible by 8, if n is an odd positive integer.

**[Section – D]**

12. Use Euclid's division lemma to show that the cube of any positive integer is either of the form 9m, 9 +1, or 9m + 8 for some integer m.
13. Show that the square of any positive integer cannot be of the form 3m + 2, where m is a natural number.

## Hints and Answers

### Section – A

1. 6
2. An odd integer
3. $0 \le r < b$
4. 5
5. x - 1

### Section - B

7. 8
8. 170 litres