

CHAPTER-01 (Real Analysis)

ASSIGNMENT-01

SUBJECT: MATHEMATICS

MAX. MARKS : 40

CLASS : X

DURATION : 1½ hrs

General Instructions:

- (i). All questions are compulsory.
- (ii). This question paper contains 20 questions divided into five Sections A, B, C, D and E.
- (iii). **Section A** comprises of 10 MCQs of 1 mark each. **Section B** comprises of 4 questions of 2 marks each. **Section C** comprises of 3 questions of 3 marks each. **Section D** comprises of 1 question of 5 marks each and **Section E** comprises of 2 Case Study Based Questions of 4 marks each.
- (iv). There is no overall choice.
- (v). Use of Calculators is not permitted

SECTION – A

Questions 1 to 10 carry 1 mark each.

1. If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$, where x and y are prime numbers, then the HCF (a, b) is:
(a) xy (b) xy^2 (c) x^3y^3 (d) x^2y^2
2. Find the greatest number of 5 digits, that will give us remainder of 5, when divided by 8 and 9 respectively.
(a) 99921 (b) 99931 (c) 99941 (d) 99951
3. The ratio between the LCM and HCF of 5, 15, 20 is:
(a) 9 : 1 (b) 4 : 3 (c) 11 : 1 (d) 12 : 1
4. Two alarm clocks ring their alarms at regular intervals of 50 seconds and 48 seconds. If they first beep together at 12 noon, at what time will they beep again for the first time?
(a) 12.20 pm (b) 12.12 pm (c) 12.11 pm (d) none of these
5. The HCF of 2472, 1284 and a third number N is 12. If their LCM is $2^3 \times 3^2 \times 5 \times 103 \times 107$, then the number N is :
(a) $2^2 \times 3^2 \times 7$ (b) $2^2 \times 3^3 \times 103$ (c) $2^2 \times 3^2 \times 5$ (d) $2^4 \times 3^2 \times 11$
6. Two natural numbers whose difference is 66 and the least common multiple is 360, are:
(a) 120 and 54 (b) 90 and 24 (c) 180 and 114 (d) 130 and 64
7. HCF of $5^2 \times 3^2$ and $3^5 \times 5^3$ is:
(a) $5^3 \times 3^5$ (b) 5×3^3 (c) $5^3 \times 3^2$ (d) $5^2 \times 3^2$
8. The HCF and the LCM of 12, 21, 15 respectively are
(a) 3, 140 (b) 12, 420 (c) 3, 420 (d) 420, 3
9. In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.
Assertion (A): For no value of n, where n is a natural number, the number 6^n ends with the digit zero.
Reason (R): For a number to end with digit zero, its prime factors should have 2 and 5.
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

10. In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

Assertion (A): If LCM of two numbers is 2475 and their product is 12375, then their HCF is 5.

Reason (R): $\text{HCF}(a, b) \times \text{LCM}(a, b) = a \times b$.

- (a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true but R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

SECTION – B

Questions 11 to 14 carry 2 marks each.

11. Find the HCF and LCM of 6, 72 and 120 using fundamental theorem of arithmetic.
12. Find the largest number that divides 2053 and 967 and leaves a remainder of 5 and 7 respectively.
13. Two numbers are in the ratio 21 : 17. If their HCF is 5, find the numbers.
14. Can we have any $n \in \mathbb{N}$, where 12^n ends with the digit zero?

SECTION – C

Questions 15 to 17 carry 3 marks each.

15. Prove that $\sqrt{5}$ is an irrational number.
16. Find HCF and LCM of 404 and 96 and verify that $\text{HCF} \times \text{LCM} = \text{Product of the two given numbers}$
17. Given that $\sqrt{2}$ is irrational, prove that $(5 + 3\sqrt{2})$ is an irrational number.

SECTION – D

Questions 18 carry 5 marks.

18. (a) On a morning walk three persons step off together and their steps measure 40 cm, 42 cm, 45 cm, what is the minimum distance each should walk so that each can cover the same distance in complete steps?
(b) There are 576 boys and 448 girls in a school that are to be divided into equal sections of either boys or girls alone. Find the total number of sections thus formed.

SECTION – E (Case Study Based Questions)

Questions 19 to 20 carry 4 marks each.

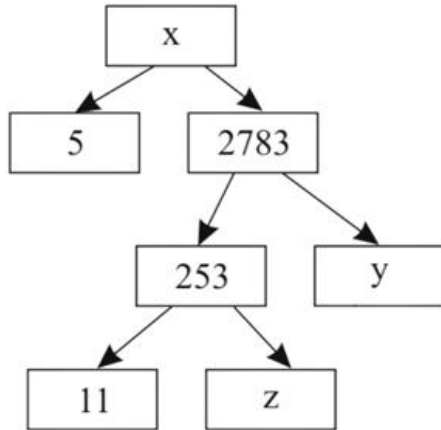
19. Ravish runs a book shop at school of Math, Gurgaon. He received 480 chemistry books, 192 physics books and 672 Mathematics books of class XI. He wishes to average these books in minimum numbers of stacks such that each stack consists of the books on only one subject and the number of books in each stack is the same.



- (a) Find the number of books in each stack.
- (b) Find the Number of stacks of Mathematics books are
- (c) Find the Minimum number of stacks of all the books.
- (d) Find the Difference in number of stacks of Mathematics books and sum of stacks of Physics and Chemistry books is

20. A Mathematics Exhibition is being conducted in your School and one of your friends is making a model of a factor tree. He has some difficulty and asks for your help in completing a quiz for the audience.

Observe the following factor tree and answer the following:



- (i) What will be the value of x?
- (ii) What will be the value of y?
- (iii) What will be the value of z?
- (iv) Write the prime factorisation of 13915.

