Date: 28/9/2021

Q1. Express each number as a product of its prime factors: 140

Q2. Express each number as a product of its prime factors: 156

Q3. 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.

Q4. Check whether 6^n can end with the digit 0 for any natural number n.

Q5. Given that HCF (306, 657) = 9, find LCM (306, 657).

Q6. Prove that $\sqrt{5}$ is irrational.

Q7. Find the HCF and LCM of 6, 72 and 120, using the prime factorisation method.

Q8. Find the HCF of 96 and 404 by the prime factorisation method. Hence, find their LCM.

Q9. Find the LCM and HCF of 6 and 20 by the prime factorisation method.

Q10. Consider the numbers 4^n, where n is a natural number. Check whether there is any value of n for which 4^n ends with the digit zero.

Q11. A sweetseller has 420 *kaju barfis* and 130 *badam barfis*. She wants to stack them in such a way that each stack has the same number, and they take up the least area of the tray. What is the maximum number of *barfis* that can be placed in each stack for this purpose?

Q12. Prove that $\sqrt{3}$ is irrational.

Q13. Use Euclid's division algorithm to find the HCF of: 135 and 225

Q14. Find the LCM and HCF of the following pairs of integers and verify that LCM $\times$ HCF = product of the two numbers.

26 and 91

Q15. Express each number as a product of its prime factors: 7429

Q16. Express each number as a product of its prime factors: 5005

Q17. Express each number as a product of its prime factors: 3825

Q18. Use Euclid's division algorithm to find the HCF of: 867 and 255

Q19. Use Euclid's division algorithm to find the HCF of: 196 and 38220

Q20. Find the LCM and HCF of the following integers by applying the prime factorisation method.

12, 15 and 21

Q21. Prove that the following is irrational: $7\sqrt{5}$

Q22. Prove that the following is irrational: $\frac{1}{\sqrt{2}}$

Q23. Find the LCM and HCF of the following integers by applying the prime factorisation method.

8, 9 and 25

Q24. Find the LCM and HCF of the following integers by applying the prime factorisation method.

17, 23 and 29

Q25. Without actually performing the long division, state whether the following rational number will have a terminating decimal expansion or a non-terminating repeating decimal expansion: $\frac{13}{3125}$

Q26. Without actually performing the long division, state whether the following rational number will have a terminating decimal expansion or a non-terminating repeating decimal expansion: $\frac{17}{8}$

Q27. Without actually performing the long division, state whether the following rational number will have a terminating decimal expansion or a non-terminating repeating decimal expansion: $\frac{23}{2^3 5^2}$

Q28. Without actually performing the long division, state whether the following rational number will have a terminating decimal expansion or a non-terminating repeating decimal expansion: $\frac{15}{1600}$

Q29. Without actually performing the long division, state whether the following rational number will have a terminating decimal expansion or a non-terminating repeating decimal expansion: $\frac{64}{455}$

Q30. Without actually performing the long division, state whether the following rational number will have a terminating decimal expansion or a non-terminating repeating decimal expansion: $\frac{6}{15}$

Q31. Without actually performing the long division, state whether the following rational number will have a terminating decimal expansion or a non-terminating repeating decimal expansion: $\frac{35}{50}$

Q32. The following real number have decimal expansions as given below. Decide whether it is rational or not. If it is rational, and of the form $\frac{p}{q}$, what can you say about the prime factors of q?

$43.\overline{123456789}$

Q33. The following real number have decimal expansions as given below. Decide whether it is rational or not. If it is rational, and of the form $\frac{p}{q}$, what can you say about the prime factors of q?

0.120120012000120000...

Q34. The following real number have decimal expansions as given below. Decide whether it is rational or not. If it is rational, and of the form $\frac{p}{q}$, what can you say about the prime factors of q?

43.123456789

Q35. Use Euclid's algorithm to find the HCF of 4052 and 12576.

Q36. Show that every positive even integer is of the form $2q$, and that every positive odd integer is of the form $2q + 1$, where q is some interger.

Q37. Show that any positive odd integer is of the form $4q + 1$ or $4q + 3$, when q is some integer.

Q38. Use Euclid's division lemma to show that the cube of any positive integer is of the form $9m$, $9m + 1$ or $9m + 8$.

Q39. Use Euclid's division lemma to show that the square of any positive integer is either of the form $3m$ or $3m + 1$ for some integer m.

[Hint: Let x be any positive integer then it is of the form $3q$, $3q + 1$, $3q + 2$. Now square each of these and show that they can be rewritten in the form $3m$ or $3m + 1$]

Q40. An army 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?

Q41. Show that any positive odd integer is of the form $6q + 1$, or $6q + 3$, or $6q + 5$, where q is some integer.

Q42. Show that $3\sqrt{2}$ is irrational.

Q43. Show that $5 - \sqrt{3}$ is irrational.

Q44. 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?

Q45. Prove that $3 + 2\sqrt{5}$ is irrational.

Q46. Without actually performing the long division, state whether the following rational number will have a terminating decimal expansion or a non-terminating repeating decimal expansion: $\frac{29}{343}$

Q47. Prove that the following is irrational: $6 + \sqrt{2}$

Q48. Find the LCM and HCF of the following pairs of integers and verify that LCM × HCF = product of the two numbers.

336 and 54

Q49. Find the LCM and HCF of the following pairs of integers and verify that LCM × HCF = product of the two numbers.

510 and 92

Q50. Without actually performing the long division, state whether the following rational number will have a terminating decimal expansion or a non-terminating repeating decimal expansion: $\frac{129}{2^2 5^7 7^5}$

Q51. Without actually performing the long division, state whether the following rational number will have a terminating decimal expansion or a non-terminating repeating decimal expansion: $\frac{77}{210}$

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S1. $2^2 \times 5 \times 7$

S2. $2^2 \times 3 \times 13$

S3. Try yourself.

S4. Try yourself.

S5. 22338.

S6. Proved.

S7. $\text{HCF} = 2 \times 3 = 6$
$\text{LCM} = 2^3 \times 3^2 \times 5 = 360$

S8. $\text{HCF} = 2^2 = 4$
$\text{LCM} = 2^5 \times 3 \times 101 = 9696$

S9. $\text{HCF} = 2$
$\text{LCM} = 2^2 \times 3 \times 5 = 60$

S10. There is no natural number 'n' for which 4^n ends with digit zero.

S11. 10.

S12. Proved.

S13. 45

S14. $\text{LCM} = 182; \quad \text{HCF} = 13$

S15. $17 \times 19 \times 23$

S16. $5 \times 7 \times 11 \times 13$

S17. $3^2 \times 5^2 \times 17$

S18. 51

S19. 196

S20. $\text{LCM} = 420; \quad \text{HCF} = 3$

S21. Proved.

S22. Proved.

S23. $\text{LCM} = 1800; \quad \text{HCF} = 1$

S24. LCM = 1139; HCF = 1

S25. Terminating

S26. Terminating

S27. Terminating

S28. Terminating

S29. Non-terminating repeating

S30. Terminating

S31. Terminating

S32. Rational, prime factors of q will also have a factor other than 2 or 5.

S33. Not rational.

S34. Rational, prime factors of q will be either 2 or 5 or both only.

S35. HCF of 12576 and 4052 is 4.

S36. Proved that even is always in form of $2q$ and odd no is $2q + 1$.

S37. Proved.

S38. An integer can be of the form $9q$, $9q + 1$, $9q + 2$, $9q + 3$, ..., or $9q + 8$.

S39. An integer can be of the form $3q$, $3q + 1$, $3q + 2$. Square all of these integers.

S40. 8 columns.

S41. An integer can be of the form $6q$, $6q + 1$, $6q + 2$, $6q + 3$, $6q + 4$ or $6q + 5$.

S42. Proved.

S43. Proved.

S44. 36 minutes.

S45. Proved.

S46. Non-terminating repeating

S47. Proved.

S48. LCM = 3024; HCF = 6

S49. LCM = 23460; HCF = 2

S50. Non-terminating repeating

S51. Non-terminating repeating