Test – Mathematics

Class 10 | Topic – Real no. & polynomial | FM-50 Marks

Sec-A(2 Marks each) 2 x 8 = 16

1. If α and β are the zeroes of the polynomial $4x^2 - 2x + (k - 4)$ and $\alpha = \frac{1}{\beta}$ find the value of k.

2. Explain why $7 \times 6 \times 5 \times 4 \times 3 + 5 \times 11$ are composite numbers.
Express as product of its prime factors : 5225

3. If the polynomial $(x^4 + 2x^3 + 8x^2 + 12x + 18)$ is divided by another polynomial $(x^2 + 5)$, the remainder comes out to be $(px + q)$. Find the value of p and q.

4. Classify the following numbers as rational or irrational : 86.212212221…
Check whether there is any value of n for which 6^n is end with Zero.

5. α *and* β are the zeros of the polynomial $f(x) = x^2 - 5x + k$ such that $\alpha - \beta = 1$, find the value of k.

6. Given that L.C.M $(150, 100) = 300$, find H.C.F $(150, 100)$ Can two numbers have 16 as their HCF and 380 as their LCM? Give reason.

7. Without actual division , show that each of the following rational numbers is a terminating decimal.
Express each in decimal form : $\frac{23}{2^3 \times 5^2}$

8. Three pieces of timber 42 m, 49 m and 63 m long have to be divided into planks of the same length.
What is the greatest possible length of each plank ?

Sec-B(2 Marks each) 3 x 8=24

9. Prove that $\frac{-2\sqrt{3} - 7}{5}$ is irrational

10. If two zeroes of the polynomial $x^4 - 6x^3 - 26x^2 + 138x - 35$ are $2 \pm \sqrt{3}$,find other zeroes.

11. Prove that $\sqrt{7}$ is irrational .

12. Find the quadratic polynomial whose zeroes are double the zeroes of $6x^2 - 13x + 6$

13. Case study : Teaching Mathematics through activities is a powerful approach that enhances students' understanding and engagement. Keeping this in mind, Ms. Mukta planned a prime number game for class 5 students. She announces the number 2 in her class and asked the first student to multiply it by a prime number and then pass it to second student. Second student also multiplied it by a prime number and passed it to third student. In this way by multiplying to a prime number, the last student got 173250 . **[CBSE 2024]**

(i) What is the least prime number used by students ? (1)
(ii) (a) How many students are in the class? (2)
Or
(b) What is the highest prime number used by students ? (2)
(iii) Which prime number has been used maximum times? (1)

14. Find zeroes of quadratic polynomial $x^2 - 15$ and verify the relationship between zeroes and coefficients of the polynomial. **[CBSE 2024]**

15. Find H.C.F and LCM of 40 , 42 and 45 by prime factorization method.

16. If α *and* β are the zeros of the polynomial $p(s) = 3s^2 - 6s + 4$ find the value of $\frac{\alpha}{\beta} + \frac{\beta}{\alpha} + 2\left(\frac{1}{\alpha} + \frac{1}{\beta}\right) + 3\alpha\beta$

MCQ

17. A pair of irrational numbers whose product is rational :- **[CBSE 2024]**

a) $(\sqrt{16}, \sqrt{4})$
b) $\sqrt{5}, \sqrt{2})$
c) $(\sqrt{3}, \sqrt{27})$
d) $(\sqrt{36}, \sqrt{2})$

18. Given H.C.F(2520,6600)=40 , **[CBSE 2024]**
LCM (2520,6600) = 252 x K , then value of K is:

a) 1650
b) 1600
c) 165
d) 1625

19. What should be from the polynomial x^2-5x+4 , so that 3 is the zero of resulting polynomial.
[CBSE 2024]

a) 1
b) 2
c) 4
d) 5

20. The smallest irrational no. by which $\sqrt{20}$ should be multiplied so as to get a rational number is
[CBSE 2024]

a) $\sqrt{20}$
b) $\sqrt{2}$
c) 5
d) $\sqrt{5}$

21.Find the number of zeroes of polynomial, given in the graph.

a) 1
b) 2
c) 4
d) none of these

22. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is

a) 13
b) 65
c) 875
d) 1750

23.If P(x) and D(r) are any two polynomials such that D(x) ≠ 0, there exists unique polynomial Q(x)and R(x) such that, P(x) = D(x). Q(x) + R(x) where :

(a) R(x) = 0 and deg R(x) > deg Q(x)
(b) (b) R(x) = 0 or deg R(x) > deg D(x)
(c) (c) deg R(x) < deg Q(x)
(d) (d) R(x) = 0 or deg R(x) < deg D(x)

24. If a= 2^3 x 3 , b= 2 x 3 x 5 , c = 3^n x 5 and LCM (a, b ,c) = 2^3 x 3^2 x 5 then n=?

a) 1
b) 2
c) 3
d) 4

25.If the zeroes of the quadratic polynomial $Ax^2 + Bx + C$, C ≠ 0 are equal, then

(a) A and B have the same sign
(b) A and C have the same sign
(c) B and C have the same sign
(d) A and C have opposite signs

26. If p and q are coprime numbers, then p^2 and q^2 are

a) coprime
b) not coprime
c) even
d) odd

27.If the zeroes of the quadratic polynomial $x^2 + (a + 1) x + b$ are 2 and -3, then

(a) a = -7, b = -1
(b) a = 5, b = -1
(c) a = 2, b = -6
(d) a =0 0, b = -6