FIRST ASSESMENT TEST – 2021

MATHEMATICS

CLASS : 10   MARKS : 100

PART – A   (1x14= 14)

1   If $n(A \times B) = 6$ and A = { 1,3} then n(B) is
    a) 1 b) 2 c) 3 d) 6

2   If there are 1024 relations from a set A = { 1,2,3,4,5} to a set B, then the number of elements in B is
    a) 3 b) 2 c) 4 d) 8

3   If the ordered pairs (a +2, 4) and (5, 2a + b) are equal then (a, b) is
a) (2 , −2)   b) (5 , 1) c) (2, 3)   d) (3, −2)

4   Let n(A)= m and n(B) = n then the total number of non-empty relations that can be defined from A to B is
    a) m^n b) n^m c) $2^{mn} - 1$ d) 2^{mn}

5   Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are
    a) 0,1,8   b) 1,4,8   c) 0,1,3   d) 1,3,5

6   Given F1 = 1 , F2 = 3 and Fn = Fn −1 + F n−2 then F5 is
    a) 3   b) 5 c) 8   d) 11

7   If the HCF of 65 and 117 is expressible in the form of 65 m −117 then the value of m is
    a) 4 b) 2 c) 1   d) 3

8   The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is
    a) 2025   b) 5220   c) 5025   d) 2520

9   If 6 times of 6th time at an A.P is equal to 7 times the 7th term, then the 13th term at the
A.P is
a) 0 b) 6 c) 7 d) 13

10   The solution of $(2x-1)^2 = 9$ is
  a) −1 b) 2 c) −1, 2 d) None of all

11   If (x −6) is the HCF of $x^2 -2x -24$ and $x^2 - kx-6$ then the values of K is
    a) 3 b) 5 c) 6 d) 8

12    $Y^2 + \dfrac{1}{y2}$ is not equal to

    a) $\dfrac{Y4+1}{Y2}$ b) $(Y + \dfrac{1}{Y})^2$ c) ($(Y - \dfrac{1}{Y})^2 + 2$ d) $(Y + \dfrac{1}{Y})^2 - 2$

13   Which of the following should be added to make $x^4 + 64$ a perfect square of
    a) $4x^2$ b) $16x^2$ c) $8x^2$ d) $-8x^2$

14   The number of points of intersection of the quadratic polynomial $x^2 + 4x + 4$ with the   x . axis

a) 0 b) 1 c) 0 or 1 d) 2

PART – B

ANSWER ANY 10   (10 x 2 = 20)

15 Let A = { 1,2,3} B= { x / x is a prime number less than 10 } find A x B ?

16 If A x B = { (3,2) (3,4) (5,2) (5,4) } then find A and B ?

17 A relation R is given by the set { (x,y) / y = x + 3, x ε (0,1,2,3,4,5) find its domain and range

18 If A = { 1,2,3,7} B = { 3,0,−1,7} then R = { (7,−1) (0,3) (3,3) (0,7)} is this a relation from A to B.

19 Use Euglid's division algorithm find the HCF of 84,90 and 120

20 Find the least number that is divisible by the first ten natural numbers..

21 $a_n = n^3 − 2$ then find first four terms ?

22 Find the 19th term of an. A.P. −11, −15, −19, ...

23 If 3 + k, 18 −k,   5k + 1 are in A.P. then find k.

24 Discuss the nature of roots of the   equation $15x^2 + 11x + 2 = 0$

25 Solve $2x^2 − 2\sqrt{6}\, x + 3 = 0$

26 Simplify $\dfrac{p2-10p+21}{p-7}$ x $\dfrac{p2+p-12}{(p-3)2}$

27 Find the LCM of $p^2 − 3p + 2$ and $p^2 − 4$

28 If α , β are the roots of $2x^2 − 7x + 5 = 0$ then find the value of $\dfrac{1}{α} + \dfrac{1}{β}$

PART – C

ANSWER ANY 10   10 x 5 = 50

29 Let A = The set of natural numbers less than 8, B = The set of all prime numbers less than 8, C= The set of even prime number. Verify A x (B-C) = (A x B) - (Ax C)

30 Let A = { x ε ω / x <2} B = { x ε N / 1< x ≤ 4} and c = { 3,5} verify that
     A x (B ∩ C) = (A x B) ∩ (Ax C)

31 If { (x,y) / y = x + 3 , x , y are natural numbers < 10 } represent the relations by
       a) an arrow diagram   b) a graph   c) a set in roster form

32 Let A = { 1,2,3,4 . . . . 45} and R be the relation defined as " is a square of a number " on A. Write R as a subset of A x A Also find its domain and range.

33 The sum of 3 consecutive terms that are in A.P in 27 and its product is 288. Find the 3 terms

34 The ratio of 6th and 8th terms of an A.P is 7:9 Find the ratio of 9th term to 13th term

35 Find the general term of an A.P whose 7th term is −1 and 16th term is 17

36 Find x, y and z given that the numbers x,10,y, 24, z are A.P.

37 If a and b are two positive integers such that $a^b \times b^a = 800$ find a and b

38 If $A = \dfrac{x}{x+1}$ B = $\dfrac{1}{x+1}$ prove that $\dfrac{(A+B)2+(A-B)2}{A \div B} = \dfrac{2(x2+1)}{x(x+1)2}$

39 If $9x^4 + 12x^3 + 28x^2 + ax + b$ is a perfect square. Find the value of a and b.

40 Find the square root at
$(4x^2 - 9x + 2)(7x^2 - 13x - 2)(28x^2 - 3x - 1)$

41 If α and β are the roots of $x^2 + 6x - 4 = 0$ find the Quadratic equation whose roots are $\dfrac{2}{\propto}$ and $\dfrac{2}{\beta}$.

42 If the roots of the equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + b^2 - ac = 0$ are real and equal. Prove that either a = 0 (or) $a^3 + b^3 + c^3 = 3abc$

PART − D   (2 x 8 =16)

43 Draw a graph of $y = x^2 - 4$ and use it to solve the equation $x^2 - x - 12 = 0$
(or)
Draw a graph of $y = x^2 + 4x + 3$ and use it to solve the equation $x^2 + x + 1 = 0$

44 Draw a graph of the quadratic equation $x^2 + x - 12 = 0$ and state its nature of roots.
(or)
Draw a graph of the equation $x^2 - 9x + 20 = 0$ and state its nature of roots.