

# FIRST REVISION TEST [2021-22]

STD : X EM

Model Q. No : 1

Date:

SUBJECT : MATHS

Marks: 100

## PART – I

14 x1 = 7

1. Answer all the 14 questions.

2. Choose the most suitable answer from the given four alternatives and write the option code with the corresponding answer.

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 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)  $(3, -2)$

3. 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)  $2^{mn}$

4. 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

5. The sum of the exponents of the prime factors in the prime factorization of 1729 is

- (A) 1                          (B) 2                          (C) 3                          (D) 4

6. Given  $F_1 = 1$ ,  $F_2 = 3$  and  $F_n = F_{n-1} + F_{n-2}$  then  $F_5$  is

- (A) 3                          (B) 5                          (C) 8                          (D) 11

7. If 6 times of 6th term of an A.P. is equal to 7 times the 7th term, then the 13th term of the A.P. is

- (A) 0                          (B) 6                          (C) 7                          (D) 13

8. The next term of the sequence  $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, \dots$  is

- (A)  $\frac{1}{24}$                       (B)  $\frac{1}{27}$                       (C)  $\frac{2}{3}$                       (D)  $\frac{1}{81}$

9. A system of three linear equations in three variables is inconsistent if their planes

- (A) intersect only at a point              (B) intersect in a line  
(C) coincides with each other              (D) do not intersect

10. If  $(x-6)$  is the HCF of  $x^2-2x-24$  and  $x^2 - kx - 6$  then the value of  $k$  is  
 (A) 3 (B) 5 (C) 6 (D) 8
11. The square root of  $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$  is equal to  
 (A)  $\left(\frac{16x^2z^4}{5y^2}\right)$  (B)  $\left(\frac{16y^2}{x^2z^4}\right)$  (C)  $\left(\frac{16y}{5xz^2}\right)$  (D)  $\left(\frac{16xz^2}{5y}\right)$
12. The solution of  $(2x - 1)^2 = 9$  is equal to  
 (A) -1 (B) 2 (C) -1, 2 (D) None of these
13. Graph of a linear equation is a \_\_\_\_\_  
 (A) straight line (B) circle (C) parabola (D) hyperbola
14. The number of points of intersection of the quadratic polynomial  $(x + 2)^2$  With the X axis is  
 (A) 0 (B) 1 (C) 0 or 1 (D) 2

## PART - II

**10 x2 = 20**

**II Answer any 10 questions.**

**Question No. 28 is compulsory.**

15. If  $A = \{1,3,5\}$  and  $B = \{2,3\}$ , then (i) find  $A \times B$  and  $B \times A$
16. If  $B \times A = \{(-2,3), (-2,4), (0,3), (0,4), (3,3), (3,4)\}$  find  $A$  and  $B$ .
17. A Relation  $R$  is given by the set  $\{(x, y) \mid y = x+3, x \in \{0,1,2,3,4,5\}\}$ . Find its domain and range.
18. Show that the square of an odd integer is of the form  $4q + 1$ , for some integer  $q$ .
19. Find  $a_8$  and  $a_{15}$  whose  $n^{\text{th}}$  term is  $a_n = \begin{cases} \frac{n^2-1}{n+3} ; n \text{ is even}, n \in N \\ \frac{n^2}{2n+1} ; n \text{ is odd}, n \in N \end{cases}$
20. Check whether the sequence are in A.P. or not?  $3\sqrt{2}, 5\sqrt{2}, 7\sqrt{2}, 9\sqrt{2}, \dots$
21. If nine terms ninth term is equal to the fifteen times fifteenth term, show that six times twenty fourth term is zero.
22. If  $3 + k, 18 - k, 5k + 1$  are in A.P. then find  $k$ .
23. Solve  $2x - 3y = 6, x + y = 1$
24. Find the LCM of the given expressions  $p^2-3p+2, p^2-4$
- 25.. Simplify:  $\frac{x^3}{x-y} + \frac{y^3}{y-x}$
26. Find the square root of the following rational expressions:  $\frac{400x^4y^{12}z^{16}}{100x^8y^4z^4}$
27. Determine the nature of the roots for the following quadratic equations  $15x^2+11x+2 = 0$
28. Find the values of ' $k$ ' for which the quadratic equation  $kx^2 - (8k+4)x + 81 = 0$  has real and equal roots?

**Answer Visit:** [https://www.kanimaths.com/2022/01/blog-post\\_25.html](https://www.kanimaths.com/2022/01/blog-post_25.html)

**PART – III****10 x 5 = 50****III Answer 10 questions. Question No. 42 is compulsory.**

29. Let  $A = \{x \in \mathbb{N} \mid 1 < x < 4\}$ ,  $B = \{x \in \mathbb{W} \mid 0 \leq x < 2\}$  and  $C = \{x \in \mathbb{N} \mid x < 3\}$ . Then verify that  $A \times (B \cup C) = (A \times B) \cup (A \times C)$
30. Let  $A = \{1, 2, 3, 7\}$  and  $B = \{3, 0, -1, 7\}$ , which of the following are relation from A to B?  
 (i)  $R_1 = \{(2, 1), (7, 1)\}$  (ii)  $R_2 = \{(-1, 1)\}$  (iii)  $R_3 = \{(2, -1), (7, 7), (1, 3)\}$   
 (iv)  $R_4 = \{(7, -1), (0, 3), (3, 3), (0, 7)\}$
31. Represent each of the given relations by (a) an arrow diagram, (b) a graph and (c) a set in roster form, wherever possible.  $\{(x, y) \mid x = 2y, x \in \{2, 3, 4, 5\}, y \in \{1, 2, 3, 4\}\}$
32. Use Euclid's Division Algorithm to find the Highest Common Factor (HCF) of 84, 90 and 120.
33. 'a' and 'b' are two positive integers such that  $a^b \times b^a = 800$ . Find a and b.
34. Find the greatest number consisting of 6 digits which is exactly divisible by 24, 15, 36?
35. The sum of 3 consecutive terms that are in A.P. is 27 and their product is 288. Find the 3 terms.
36. If  $(m+1)^{\text{th}}$  term of an A.P. is twice the  $(n+1)^{\text{th}}$  term, then prove that  $(3m+1)^{\text{th}}$  term is twice the  $(m+n+1)^{\text{th}}$  term.
37. Solve the following system of linear equations in three variables.  
 $x + y + z = 5$ ;  $2x - y + z = 9$ ;  $x - 2y + 3z = 16$
38. Simplify  $\frac{1}{x^2-5x+6} + \frac{1}{x^2-3x+2} - \frac{1}{x^2-8x+15}$
39. If  $A = \frac{2x+1}{2x-1}$ ,  $B = \frac{2x-1}{2x+1}$ , find  $\frac{1}{A-B} - \frac{2B}{A^2-B^2}$  **Visit:** <https://youtu.be/JbYuFp0n9K8>
40. Find the square root of the following polynomials by division method  $37x^2 - 28x^3 + 4x^4 + 42x + 9$
41. A bus covers a distance of 90 km at a uniform speed. Had the speed been 15 km/hour more it would have taken 30 minutes less for the journey. Find the original speed of the bus.
42. If  $\alpha, \beta$  are the roots of the equation  $2x^2 - x - 1 = 0$ , then form the equation whose roots are  $\frac{1}{\alpha}, \frac{1}{\beta}$

**PART – IV****2 x 8 = 16****IV. Answer any one questions.**

43. a) Discuss the nature of solutions of the following quadratic equations.  $x^2 + 2x + 5 = 0$  (or)  
 b) Graph the following quadratic equations and state their nature of solutions.  $x^2 - 4x + 4 = 0$
44. a) Draw the graph of  $y = x^2 - 4x + 3$  and use it to solve  $x^2 - 6x + 9 = 0$ . (or)  
 b) Draw the graph of  $y = x^2 - 5x - 6$  and hence solve  $x^2 - 5x - 14 = 0$ .

**Answer Visit:** [https://www.kanimaths.com/2022/01/blog-post\\_25.html](https://www.kanimaths.com/2022/01/blog-post_25.html)

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