

K COMMON FIRST MID - TERM TEST - 2019

STANDARD - X

MATHEMATICS

Time : 1.30 hours

Marks: 50

PART - A

I. Choose the correct answer:

8×1=8

- If $n(A \times B) = 6$ and $A = \{1, 3\}$ then $n(B)$ is
a) 1 b) 2 c) 3 d) 6
- If $f : A \rightarrow B$ is a bijective function and if $n(B) = 7$, then $n(A)$ is equal to
a) 7 b) 49 c) 1 d) 14
- The sum of the exponents of the prime factors in the prime factorization of 1729 is
a) 1 b) 2 c) 3 d) 4
- The value of $(1^3 + 2^3 + 3^3 + \dots + 15^3) - (1 + 2 + 3 + \dots + 15)$ is
a) 14400 b) 14200 c) 14280 d) 14520
- If $(x - 6)$ is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of k
a) 3 b) 5 c) 6 d) 8
- The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to
a) $\frac{16}{5} \left| \frac{x^2z^4}{y^2} \right|$ b) $16 \left| \frac{y^2}{x^2z^4} \right|$ c) $16 \left| \frac{y}{xz^2} \right|$ d) $\frac{16}{5} \left| \frac{xz^2}{y} \right|$
- If in triangles ABC and EDF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar, when
a) $\angle B = \angle E$ b) $\angle A = \angle D$ c) $\angle B = \angle D$ d) $\angle A = \angle F$
- In $\triangle LMN$, $\angle L = 60^\circ$, $\angle M = 50^\circ$. If $\triangle LMN \sim \triangle PQR$ then the value of $\angle R$ is
a) 40° b) 70° c) 30° d) 110°

PART - B

II. Answer any 6 questions. Q.No. 15 is compulsory:

6×2=12

- A Relation R is given by the set $\{x, y / y = x + 3, x \in \{0, 1, 2, 3, 4, 5\}\}$. Determine its domain and range.
- Let $A = \{-1, 1\}$ and $B = \{0, 2\}$. If the function $f : A \rightarrow B$ defined by $f(x) = ax + b$ is an onto function? Find a and b.
- Find the largest number which divides 1230 and 1926 leaving remainder 12 in each case.

12. In a G.P. 729, 243, 81 Find t_7 .
13. Find the LCM of $16m$, $-12m^2n^2$, $8n^2$.
14. Add : $\frac{x+2}{x+3} + \frac{x-1}{x-2}$
15. If $A = \{-2, -1, 0, 1, 2\}$ and $f : A \rightarrow B$ is an onto function defined by $f(x) = x^2 + x + 1$ then find B. **(OR)**
Find the sum first 15 terms of the A.P 8, $7\frac{1}{4}$, $6\frac{1}{2}$, $5\frac{3}{4}$

PART - C

III. Answer any 4 questions. Q.No. 21 is compulsory. 4×5=20

16. Let $f : A \rightarrow B$ be a function defined by $f(x) = \frac{x}{2} - 1$ where $A = \{2, 4, 6, 10, 12\}$; $B = \{0, 1, 2, 4, 5, 9\}$ Represent f by i) set of ordered pairs. ii) a table iii) an arrow diagram iv) a graph.
17. If $f(x) = 2x + 3$, $g(x) = 1 - 2x$ and $h(x) = 3x$ prove that $f \circ (g \circ h) = (f \circ g) \circ h$
18. The sum of first n , $2n$ and $3n$ terms of an A.P. are S_1 , S_2 and S_3 respectively. Prove that $S_3 = 3(S_2 - S_1)$
19. Find the sum to n terms of the series $3 + 33 + 333 + \dots$ to n terms.
20. Find the GCD of $x^4 + 3x^3 - x - 3$, $x^3 + x^2 - 5x + 3$
21. Find the square root of $x^4 - 12x^3 + 42x^2 - 36x + 9$. **(OR)**
Rekha has 15 square colour papers of sizes 10cm, 11cm, 12cm 24cm. How much area can be decorated with these colour papers?

PART - D

IV. Answer any one question: 1×10=10

22. Draw the graph of the quadratic equation $x^2 - 9x + 20 = 0$ and State their nature of solutions. **(OR)**

Construct a triangle similar to a given triangle PQR with its sides equal to $\frac{2}{3}$ of the corresponding sides of the triangle PQR (Scale factor $\frac{2}{3}$)