

Maths

Time : 01:30:00 Hrs

Total Marks : 50

5 x 1 = 5

Part A

- 1) $A = \{a, b, p\}$, $B = \{2, 3\}$, $C = \{p, q, r, s\}$ then $n[(A \cup C) \times B]$ is
 (a) 8 (b) 20 (c) 12 (d) 16
- 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) Euclid's division lemma states that for positive integers a and b , there exist unique integers q and r such that $a = bq + r$, where r must satisfy
 (a) $1 < r < b$ (b) $0 < r < b$ (c) $0 \leq r < b$ (d) $0 < r \leq b$
- 4) If the HCF of 65 and 117 is expressible in the form of $65m - 117$, then the value of m is
 (a) 4 (b) 2 (c) 1 (d) 3
- 5) 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

Part B (Answer any Five Questions)

5 x 2 = 10

- 6) 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
 (i) $A \times (B \cup C) = (A \times B) \cup (A \times C)$
 (ii) $A \times (B \cap C) = (A \times B) \cap (A \times C)$
- 7) Given $f(x) = 2x - x^2$, find
 (i) $f(1)$
 (ii) $f(x+1)$
 (iii) $f(x) + f(1)$
- 8) Let $A = \{1, 2, 3, 4\}$ and $B = \{-1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12\}$ Let $R = \{(1, 3), (2, 6), (3, 10), (4, 9)\} \subseteq A \times B$ be a relation. Show that R is a function and find its domain, co-domain and the range of R .
- 9) if $1 + 2 + 3 + \dots + n = 666$ then find n .
- 10) If l^{th} , n^{th} and m^{th} terms of an A.P are x , y , z respectively, then show that
 $(x - y)n + (y - z)m + (z - x)l = 0$
- 11) Find the sum of
 $15^2 + 16^2 + 17^2 + \dots + 28^2$
- 12) Find the sum of
 $9^3 + 10^3 + \dots + 21^3$

Part C (Answer any Five Questions)

5 x 3 = 15

- 13) Let $A = \{1, 2, 3, 4\}$ and $B = \{2, 5, 8, 11, 14\}$ be two sets. Let $f: A \rightarrow B$ be a function given by $f(x) = 3x - 1$. Represent this function
 (i) by arrow diagram
 (ii) in a table form
 (iii) as a set of ordered pairs
 (iv) in a graphical form
- 14) Let f be a function $f: \mathbb{N} \rightarrow \mathbb{N}$ be defined by $f(x) = 3x + 2x \in \mathbb{N}$
 (i) Find the images of 1, 2, 3
 (ii) Find the pre-images of 29, 53
 (iii) Identify the type of function
- 15) Find the sum of $0.40 + 0.43 + 0.46 + \dots + 1$
- 16) How many terms of the series $1 + 5 + 9 + \dots$ must be taken so that their sum is 190?
- 17) Find the sum of all natural numbers between 300 and 600 which are divisible by 7.
- 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 $5 + 55 + 555 + \dots$

Part D (Answer any Four Questions)

4 x 5 = 20

- 20) The function 't' which maps temperature in Celsius (C) into temperature in Fahrenheit (F) is defined by $t(C) = F$ where $F = \frac{9}{5}C + 32$. Find,
 (i) $t(0)$
 (ii) $t(28)$
 (iii) $t(-10)$
 (iv) the value of C when $t(C) = 212$
 (v) the temperature when the Celsius value is equal to the Fahrenheit value.
- 21) Consider the functions $f(x)$, $g(x)$, $h(x)$ as given below. Show that $(f \circ g) \circ h = f \circ (g \circ h)$ in each case.
 $f(x) = x - 1$, $g(x) = 3x + 1$ and $h(x) = x^2$
- 22) A positive integer when divided by 88 gives the remainder 61. What will be the remainder when the same number is divided by 11?
- 23) In a G.P. the product of three consecutive terms is 27 and the sum of the product of two terms taken at a time is $\frac{57}{2}$. Find the three terms.
- 24) Rekha has 15 square colour papers of sizes 10 cm, 11 cm, 12 cm, ..., 24 cm. How much area can be decorated with these colour papers?

All the Best.....

kindly send me your key Answers to our email id - padasalai.net@gmail.com



kindly send me your key Answers to our email id - padasalai.net@gmail.com