PADASALAI CREATIVE QUESTIONS 2019-2020

RELATIONS AND FUNCTIONS

10th Standard 2019 EM

Date : 02-Jul-19

**MATHS**

Reg.No. : | | | | | | |

***Use Blue or Black pen only***

Time : 01:30:00 Hrs

Total Marks : 50

## PART - A

5 x 1 = 5

### I. CHOOSE THE CORRECT ANSWER

1) A={a,b,p}, B={2,3}, C={p,q,r,s} then n[(A U C) x B] is

(a) 8 (b) 20 (c) 12 (d) 16

2) 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) $2^{mn}$

3) If $f(x)=2x^2$ and $g(x)=\frac{1}{3x}$, then f o g is

(a) $\frac{3}{2x^2}$ (b) $\frac{2}{3x^2}$ (c) $\frac{2}{9x^2}$ (d) $\frac{1}{6x^2}$

4) Let $f(x) = \sqrt{1+x^2}$ then

(a) $f(xy) = f(x).f(y)$ (b) $f(xy) \geq f(x).f(y)$ (c) $f(xy) \leq f(x).f(y)$ (d) None of these

5) $f(x) = (x+1)^3 - (x-1)^3$ represents a function which is

(a) linear (b) cubic (c) reciprocal (d) quadratic

## PART - B

5 x 2 = 10

### II. ANSWER THE FOLLOWING QUESTIONS

6) LetA= {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 x B bea relation. Show that R is a function and find its domain, co-domain and the range of R.

7) Let A = {0, 1, 2, 3} and B = {1, 3, 5, 7, 9} be two sets. Letf: A $\rightarrow$B be a function given by f(x) = 2x + 1. Represent this function as a set of ordered pairs.

8) Let A = {0, 1, 2, 3} and B = {1, 3, 5, 7, 9} be two sets. Letf: A $\rightarrow$B be a function given by f(x) = 2x + 1. Represent this function as an arrow .

9) Let A = {0, 1, 2, 3} and B = {1, 3, 5, 7, 9} be two sets. Letf: A $\rightarrow$B be a function given by f(x) = 2x + 1. Represent this function as a graph.

10) Given $f(x) =2x-x^2$, find

(i) f (1)

(ii) f (x+1)

(iii) f (x) + f (1)

## PART - C

5 x 3 = 15

### III. ANSWER THE FOLLOWING QUESTIONS

11) The arrow diagram shows a relationship between the sets P and Q. Write the relation in (i) Set builder form (ii) Roster form (iii) What is the domain and range of R.

12) A functionf: [-7,6) $\rightarrow$ R is defined as follows.

$$f(x) = \begin{cases} x^2+2x+1 & -7 \leq x < -5 \\ x+5 & -5 \leq x \leq 2 \\ x-1 & 2 < x < 6 \end{cases}$$

find 2f(-4) + 3/(2)

13) A functionf: [-7,6) $\longrightarrow$ R is defined as follows.

$$f(x)=\begin{cases} x^2+2x+1 & -7\le x<-5 \\ x+5 & -5\le x\le 2 \\ x-1 & 2<x<6 \end{cases}$$

$$\frac{4f(-3)+f2(4)}{f(-6)-3f(1)}$$

14) f(x) = (1+ x)

g(x) = (2x-1)

Show that fo(g(x)) = gof(x)

15) Let A = {1, 2, 3, 4, 5}, B = N and f: A $\longrightarrow$B be defined by f(x) = $x^2$. Find the range of f. Identify the type of function.

**PART - D** 5 x 5 = 25

**IV. ANSWER THE FOLLOWING QUESTIONS**

16) A function f: [-5,9] $\longrightarrow$ R is defined as follows:

$$f(x)=\begin{cases} 6x+1 & \text{if } -5\le x<2 \\ 5x^2-1 & \text{if } 2\le x<6 \\ 3x-4 & \text{if } 6\le x\le 9 \end{cases}$$

Find $\frac{2f(-2)-f(6)}{f(4)+f(-2)}$.

17) Consider the functions f(x), g(x), h(x) as given below. Show that (f o g) o h = f o (g o h) in each case.

f(x)=$x^2$, g(x)=2x and h(x)=x+4

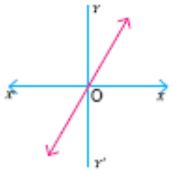
18) Given that {

$$f(x)=\begin{cases} \sqrt{x-1} & x\ge 1 \\ 4 & x<1 \end{cases}.$$

Find

f(a+1) in terms of a (Given that a≥0)

19) Determine whether the graph given below represent functions. Give reason for your answers concerning each graph.




20) The following table represents a function from A = {5, 6, 8, 10} to B = {19, 15, 9, ll}, where f(x) = 2x-1. Find the values of a and b.

| **x** | 5 | 6 | 8 | 10 |
|---|---|---|---|---|
| **f(x)** | a | 11 | b | 19 |

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