SHIKSHA CLASSES

Subject : Maths - II | **Question Paper** | **Total Marks :20**

Class : XI | **6 : Functions** | **Time : 1 Hour**

SECTION - A

Q.1 : Choose the correct option : 4

i) Let the function f be defined by $f(x) = \frac{2x+1}{1-3x}$ then $f^{-1}(x)$ is:

a) $\frac{x-1}{3x+2}$ b) $\frac{x+1}{3x-2}$ c) $\frac{2x+1}{1-3x}$ d) $\frac{3x+2}{x-1}$

ii) If $\log(5x-9) - \log(x+3) = \log 2$ then x = ...

a) 3 b) 5 c) 2 d) 7

Q.2 : Solve the following questions: **2**

i) If $f(x) = x^2 + 2$ and $g(x) = 5x - 8$, then find $(f+g)(1)$

ii) Write log72 in terms of log2 and log3

SECTION B

Solve the following : (ANY 2) 4

Q.3 : Find x, if $f(x) = g(x)$ where ;

i) $f(x) = x^4 + 2x^2$, $g(x) = 11x^2$

ii) $f(x) = \sqrt{x} - 3$, $g(x) = 5 - x$

Q.4 : Find the domain and range of the following functions : $f(x) = \sqrt{(x-2)(5-x)}$

Q.5 : If $f(x) = ax^2 - bx + 6$ and $f(2) = 3$ and $f(4) = 30$, find a and b.

SECTION C

Solve the following : (ANY 2) 6

Q.6 : If $x = \log_a bc$, $y = \log_b ca$, $z = \log_c ab$, then prove that :

$$\frac{1}{1+x} + \frac{1}{1+y} + \frac{1}{1+z}$$

Q.7 : Verify that f and g are inverse functions of each other, where;

$$f(x) = \frac{x+3}{x-2}, g(x) = \frac{2x+3}{x-1}$$

Q.8 : Show that : a) -

$$7\log\left(\frac{15}{16}\right) + 6\log\left(\frac{8}{3}\right) + 5\log\left(\frac{2}{5}\right) + \log\left(\frac{32}{25}\right) = \log 3$$

b) If $f : A \to B$ and $g : B \to C$ are one - one, then gof is also one - one

SECTION D

Solve the following : (ANY 1) 4

Q.9 : Solve for x :

i) $2\log_{10} x = 1 + \log_{10}\left(x + \frac{11}{10}\right)$

ii) $x + \log_{10}(1 + 2^x) = x\log_{10} 5 + \log_{10} 6$

Q.10 : Find the domain of the following functions.

i) $(x) = \sqrt{1 - \sqrt{1 - \sqrt{1 - x^2}}}$

ii) $f(x) = \sqrt{\log(x^2 - 6x + 6}$

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